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Invited Speakers

Why and How to Improve Bioactivity of Drugs on the Basis of Moderne Bioinformatic POM Analyses

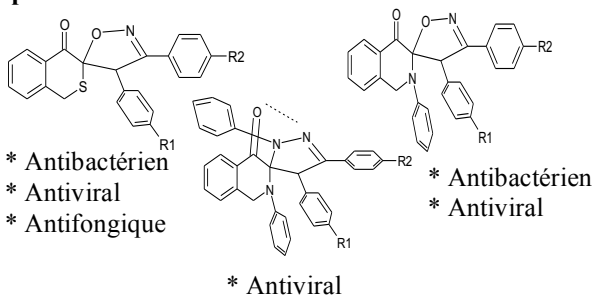
Taibi Ben Hadda

LCM Laboratory, Sciences Faculty, Mohammed Premier University, Oujda 60000. Morocco.

Abstract

A computational Petra/Osiris/Molinspiration (POM) Theory based model has been developed for the identification of physic–chemical parameters governing the bioactivity of quinoxaline and spiro derivatives of thiochromane containing combined antibacterialal/antiviral pharmacophore sites. Various compounds analyzed here were previously experimentally and now virtually screened for their antibacterial/antiviral activity. The highest antiviralal activity was obtained for compound having an antiviral ($O^{\delta-}$ --- $N^{\delta-}$) pharmacophore site, which exhibited excellent % inhibition, comparable to standard drugs. Compounds having an ($O^{\delta-}$ --- $O^{\delta+}$) pharmacophore site, represents increased antibacterial activity as compared to its analogues. The increase of antiviral bioactivity could be attributed to the existence of *pi*-charge transfer from oxazol ring to its aryl group, which plays a crucial template role in the organization of antiviral O,N-phramacophore site. Moreover, it is cheap, has fewer side effects. So the purpose of this oral communication is to help both chemist and biologist in drug design.

Graphical abstract



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Biography

Prof. Taibi BEN HADDA has his expertise in evaluation and passion in Organic/ Organometallic Chemistry and drug design of new bioactive molecules which should be used against bacteria, viruses, parasite and cancer. His focus is based on the use of POM calculations as new bioinformatic methode to identify pharmacophore sites with application in health field. He was warded his PhD in 1996 from the University of Rennes, France. He published more than 350 papers.

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Spatio-temporal studies of spin-crossover materials: watching and simulating phase transition dynamics

Kamel Boukheddaden[1]. Mouhamadou Sy[1], Guillaume Bouchez[1], Ahmed Slimani[1], Smail Triki[2], Eric Milin[2], Narshima Pittala[2], and Sumio Kaizaki[3]

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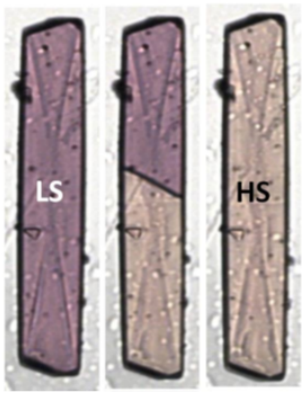
Abstract

We investigated the spatiotemporal studies on the single crystal of the dinucleariron(II) compound [{Fe(NCSe)(py)$_2$}$_2$ (μ-bpypz)], which exhibits a thermal spin transition with hysteresis near 100 K. The robust character of the crystals made possible the investigation of both on-cooling and on-heating processes. We observed well-defined transformation fronts,[1,2] between macroscopic high-spin (HS) and low-spin (LS) phases. The fronts are almost linear in shape, and propagate through the entire crystals, even in isothermal conditions (see Figure). The interface orientation was ~ constant and its propagation velocity typically was ~ 1 and 10 μm/s for the on-cooling and on-heating processes, respectively. The videos of the spin transition processes will be shown in real (or accelerated) time. Using microscopic models,[3-6] we succeeded to simulate the experimental data and explained the physical origin of the stable front orientation as well as that of the elastic front dynamics.



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Biography

The author is a full Professor of Physics since 2005 in Versailles's University. He is a solid state physicist, expert of equilibrium and non equilibrium aspects of phase transitions in molecular solids, including spin-crossover systems, Prussian Blue analogs, charge transfer solids (mixed valences) and photo-luminescent hybrid organic-inorganic for which he is currently studying the correlation between their optical and structural properties. The author has also an expertise in real time optical microscopy imaging of phase transitions, and in theory of phase transitions, including elastic models, Monte Carlo simulations, Molecular Dynamics and reaction-diffusion models for spatiotemporal description of phase transitions. He was awarded his PhD in 1993 from the University of Pierre et Marie Curie (Paris VI), France. He published more than 190 papers and he was invited in more than 100 international conferences or workshops. His H-index is ~ 33 on Scopus.

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Bacterial biofilm challenges and progress

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Abstract

Bacterial biofilm in food and medical sectors constitutes a great public health concerns. In addition, it's known that abiotic surfaces are vulnerable to bacterial adhesion and to biofilm formation. In addition, the environmental conditions, commonly met in food and medical area enhance biofilm formation and their resistance to disinfectant agents. Therefore, it is necessary to understand interaction between bacteria and abiotic surfaces to find out solutions against cell adhesion and biofilm formation. Bacteria embedded in biofilms are more resistant to sanitizing agents than those growing under planktonic state. The understanding of bacterial adhesion and biofilm formation on abiotic surfaces is of interest to setup efficient anti-biofilm strategies. In this context, this paper highlights the main factors controlling the bacterial adhesion and biofilm formation on abiotic surfaces. It also describes the current and emergent strategies used to eradicate and prevent the biofilm formation on the most frequently used abiotic surface.

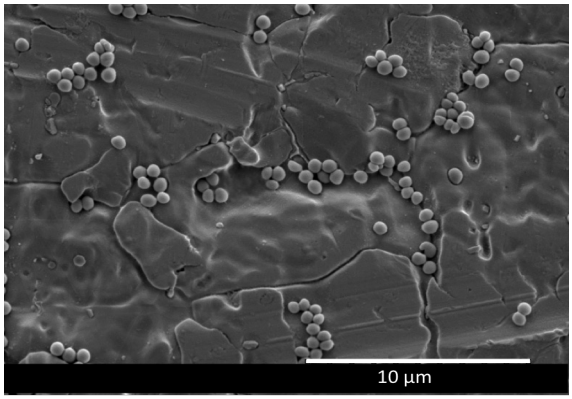

Figure 1: Scanning electron microscopy image illustrating the adhesion of Staphylococcus aureus CIP 4.83 on 316L stainless steel after 1 h of incubation at 37°C. The scale bar in the image is 10 µm.

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Biography

Prof. Nour-Eddine CHIHIB presented his PhD Thesis in 1998 at the University of Science and Technology of Lille on stress physiological response of food spoilage microorganisms. He moved to Danmark to take a postdoctoral position at the Danish Institute for Fisheries Research. After he came back to France for a Post-doctoral position at the "Écolenationalevétérinaire de Nantes". He started his research career since (1995) at the University of Science and technology of Lille. He is author of more than 60 research papers in international journals. He is a Professor at Lille University. His research activity is realized at the UMET UMR CNRS INRA-8207 laboratory within the INRA Processus aux Interfaces et Hygiène des Matériaux team. He is developing research on antibacterial and antibiofilm strategies and studying the interactions at the interfaces between bacteria and materials.

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MOF Design to Applications: Impact of Pore System Control on Gas Separations and Storage

Mohamed Eddaoudi

Advanced Membranes and Porous Materials Centre, Functional Materials Design, Discovery and development (FMD3) Research Group; King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia.

Abstract

Demand for functional materials targeted for specific applications is ever increasing as societal needs and demands mount with advancing technology. The building-block approach, whereby at the design stage the desired properties and functionality can be introduced in preselected molecular building blocks (MBBs) prior to the assembly process, has emerged as a prominent pathway for the rational construction of functional solid- state materials.

One class of inorganic-organic hybrid materials, metal-organic frameworks (MOFs), has burgeoned in recent partly years due to effective design strategies (i.e. reticular chemistry) for their synthesis and their inherent [and readily interchangeable] hybrid, functional character.

Various key gas/vapors separations are accomplished using energy intensive processes as exemplified by the olefin/paraffin separation, an essential separation in chemical industry.

Here we present our progress in the development of functional metal-organic frameworks (MOFs) to address some energy-intensive separations. Successful practice of reticular chemistry had afforded the fabrication of chemically stable fluorinated MOF adsorbent materials (**NbOFFIVE**-1-Ni, also referred to as **KAUST**-7 and **AlFFIVE**-1-Ni, also referred to as **KAUST**-8). The restricted MOF window resulted in the selective molecular exclusion of propane from propylene at atmospheric pressure, as evidenced by multiple cyclic mixed-gas adsorption and calorimetric studies. Remarkably, **KAUST**-7 maintains its distinctive separation properties in the presence of water as a result of its high chemical and hydrolytic stability.[1]

The development of suitable storage and refining processes makes natural gas an excellent alternative fuel, but before its transport and use, natural gas must first be dehydrated. Conventional dehydration agents are energy intensive. **KAUST**-8 selectively removes water and requires just 105°C for regeneration of the dehydrating agent.[2]

The deliberate control of the pore aperture-size of various selected MOFs and its impact on various separations will be discussed.

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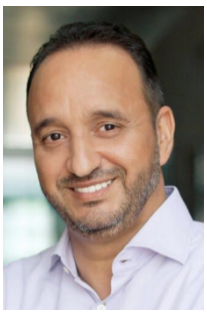
Biography



Prof. Mohamed Eddaoudi is a Distinguished Professor of Chemical Science), and Director of the Advanced Membranes and Porous Materials Center at King Abdullah University of Science and Technology (KAUST).

Dr. Eddaoudi received his master's and doctorate in Chemistry from Denis Diderot University (Paris VII) in Paris, France.

Dr. Eddaoudi is a member of the American Chemical Society. He received the Outstanding Faculty Research Achievement Award (2004 and 2007) and the Chemistry Outstanding Teaching Award (2005 and 2008) from the University of South Florida.

He was awarded the prestigious National Science Foundation Career Award in 2006.

Dr. Eddaoudi has given more than 150 invited talks at conferences and universities since 2002.

Dr. Eddaoudi was selected in 2014, 2015, 2016 and 2017 as Thomson Reuters Highly Cited Researchers and world's most influenced scientific minds (2014).

His contribution to the field of metal-organic frameworks (MOFs) has been highly visible in peer-reviewed journals, as evidenced through his recognition by ISI in 2007 as one of the top 100 most cited chemists of the past 10 years (ranked #68), http://in-cites.com/nobel/2007-che-top100.html.

Research Interests

Develop new strategies for the rational design and construction of functional solid state materials.

Design and synthesis of functional porous solids for Energy and Environmental Sustainability: including coordination polymers, metal-organic frameworks (MOFs), porous organic polymers (POPs) for Hydrogen storage, Methane storage, CO_2 capture & storage.

Metal-Organic Materials based Sorbents and Membranes addressing the energy-intensive gas or vapor.

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An overview on nanocomposites based on conducting polymers and carbon or metal nanoparticles

Mama El Rhazi

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Abstract

Organic conducting polymers, born in 1977 with the pioneering work of MacDiarmid, have received great attention due to their potential application. .Over the years, intensive research works have been devoted to preparation and characterization of conducting polymers such as polyaniline (PANI), polypyrrole (PPy), diaminonaphthalene (DAN) and their derivatives. Their application in batteries, sensors, capacitors, electronic devices or electrochromic displays were very promising. To improve the properties of these compounds, several new approaches have been developed which consist in combining conducting polymers and nanoparticles. Then, this lecture intends to give a clear overview on nanocomposites based on conducting polymers, synthesis, characterization and their application as electrochemical sensors. The first part will highlight the nanocomposites synthesized by combination of carbon nanomaterials (CNMs) and conducting polymers (CPs). The preparation of polymer/CNMs such as graphene, Carbon nanotube modified electrode is presented coupled with relevant applications. The second part consists of a review of nanocomposites synthesized by combination of metal nanoparticles/conducting polymers and ionic liquid.

Acknowledgments

This work was supported by MESRSFC (Ministère de l'enseignementSupérieuret de la Recherchescientifique et de la Formation des Cadres) and CNRST (Centre National pour la Recherche Scientifique et Technique) Project No: PPR/2015/72.

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Argane oil: the Moroccan green medicine with many therapeutic potentials

Mourad Errasfa

Department of Pharmacology, Head Research laboratory of Molecular Basis of Human Pathologies and Therapeutic Tools Faculty of Medicine and Pharmacy, University Sidi Mohamed Ben Abdellah, Fez. Morocco.

Abstract

Argan oil is produced from nuts of Argania Spinosa. L tree. It is highly enriched with bioactive substances such as tocopherols, carotenoïds, sterols and polyphenol molecules, and it is a rich source of essential fatty acids such as oleic and linoleic acids. Each of these classes of molecules were shown to exert anti-oxidant, anti-tumor and anti-inflammatory activities in isolated cells and/or animal experiments. Experimental data have shown that argane oil is effective in improving hypertension, hyperglycemia and dyslipidemia. However, clinical evidence for such activities are scarce, and the main data reported so far in clinical studies have focused on the ability of argan oil to regulate blood lipids and to improve the oxidative status in men. In the present presentation, I summarize some recent clinical and biochemistry results on the effects of Argan oil consumption, in particular, those studied in end stage renal failure patients under hemodialysis, and knee osteoarthritis patients. The main outcomes of Argan oil consumption are significant improvement of blood lipids status, lipid atherogenic ratios, oxidative status, some metabolic syndrome components and pain scores. In light of the above biological and clinical effects of argane oil, some potentially therapeutic perspectives will be discussed, such as cardiovascular, vision and memory loss issues.

Biography

Dr Mourad Errasfa was born in Oujda in 1959. He graduated from the University of Mohamed I in Oujda (Morocco, 1981) and The University of François Rabelais (Tours, France, 1983). He has got his Ph.D in pharmacology from the University of René Descartes- Sciences Pharmaceutiques (Paris V, 1988). He has several PostDoc experiences in the USA (Harvard Medical School and Massachusetts General Hospital, New York University Medical Center) and Spain (Instituto de Investigacionès Biologicas,Valencia). In 1999, he was appointed as a medical officer at the Ministry of Health of Morocco (Department of medicine, Rabat), then in 2003, he joined the Faculty of Medicine and Pharmacy (USMBA) of Fès as a professor of pharmacology. He is coordinating a group of research (GRETHA, groupe de recherchessur les effets thérapeutiques de l'huile d'argane) on argane oil health benefits.

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Sensing temperature, pressure and toxic industrial chemicals in selected nanomaterials and metal-organic frameworks

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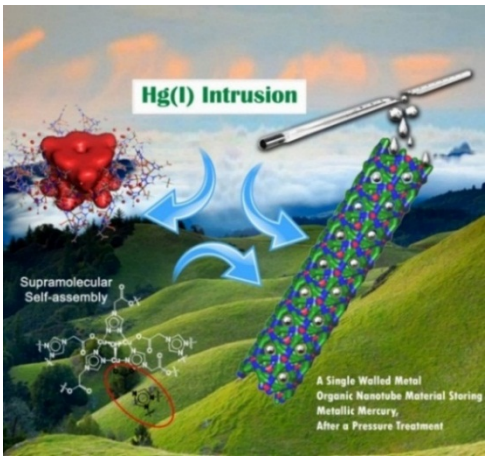
Abstract

Iron(II) spin crossover (SCO) complexes nowadays attract a great deal of interest,[1,2] due to their potential technological applications, for instance in sensor devices.[3]In this respect, SCO nanomaterials have emerged as an appealing class considering nanostructuration processes and size reduction effects.[4] Although sophisticated and sometimes costly techniques can be used for the preparation of SCO nanoparticles/thin films, we have recently introduced the use a botanic biomembrane as a soft, green and cheap support for deposition of SCO micro and nanocrystals. In addition, the inked membrane can be used as a stamp bymicro-contact printing on various inorganic supports.[5] More recently, we have investigated templating effects of both metal organic frameworks and MCM-41 to include SCO materials, in particular iron(II) coordination polymers.[6] This later class of materials, which were shown to present the LIESST (Light Induced Excited Spin State Trapping) effect,[7] afforded the first iron(II) one-dimensional chain with 1,2,4-triazole ligands displaying on cooling below room temperature, a thermally induced two-step spin conversion.[8] This compound was discovered in the frame of our investigation of a new range of porous metal organic frameworks including 1,2,4-triazole ligands built from amino acids building blocks, one of them having been proposed for $Hg_{(l)}$ detection and storage (See Figure).[9] Within the same family, we recently isolated a one-dimensional SCO chain switching at room temperature but displaying a wide bistability domain of 60 K, perfectly reproducible and not associated with any solvent release/absorption.[10]His potential use in shock detection will be discussed.[11]Last but not least, we recently investigated the potentiality of azole based metal complexes to probe toxic industrial chemicals (TICs), after having demonstrated the feasibility to detect methanol and ethanol.[12,13]



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Biography

Yann Garcia is prof. of chemistry. His research activities extend from metal-organic frameworks and supramolecular coordination chemistry of azole based frameworks to photo- and thermoswitchable coordination compounds and magnetic hybrid nanomaterials. He is also interested by the input of Mössbauer spectroscopy and muon spin relaxation to coordination chemistry issues. He was awarded his PhD in Jan. 1999 with the highest distinction from the Univ. of Bordeaux, after writing an original dissertation supervised by the late Prof. Olivier Kahn at the ICMCB. The author has co-authored more than 210 papers with several cover pages of top chemistry journals, including 13 book chapters on Inorganic Chemistry, several guest editions and two patent applications. His h-index was 41 with 7395 citations (Google Scholar, Jan. 2018). Among several editorial activities, he is editor in chief of Curr. Inorg.Chem. (Bentham science), editorial board member of Eur. J. Inorg.Chem. (Wiley-VCH) and associate editor of the Mössb.Eff. Ref. Data J. (CAS, China). Since 2007, he chairs the Mössbauer French Speaking Society gathering more than 80 laboratories (www.gfsm.fr), which met in 2017 in Béni-Mellal. He entered in 2009 the International Board of the Applications of the Mössbauer Effect (IBAME), representing Belgium. The same year, he was selected among the next future leaders of Mössbauer spectroscopy by the Mössbauer Effect Data Center. His research group is active within two COST actions at the European level on molecular spintronicsand spin state switching.

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Photodynamics Characterization of Luminescent Zr-Based MOFs for LED and Sensing Applications

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Abstract

Metal-Organic Frameworks (MOFs) are a class of crystalline porous materials composed by metal-clusters interlinked by organic ligands. Their excellent physicochemical properties (large surface areas and accessible cavities), as well as their relatively easy and tunable synthesis, make them ideal candidates for a wide range of uses and applications. Recently, the synthesis of new kind of luminescent MOFs (LMOFs) have boosted their use in fields hitherto not explored as LED fabrication and sensing of different chemical compounds. However, to deeply understand their photobehaviour and to further improve their efficiency in related fields, it is paramount to carry out a high-level spectroscopic and ultrafast photodynamics characterization of these LMOFs (1-5). Armed with advanced spectroscopy, we have unveiled the luminescence and photodynamics properties of a Zr-NDC (NDC= naphthalene dicarboxylate) LMOF and its composite, C153@Zr-NDC, embedded both into a polycarbonate matrix (4). We have observed blue emission of the LMOF owing to its aggregation in the polymer film and green emission of C153@Zr-NDC due to energy transfer (~800 ps) from MOF to trapped C153 dye (Figure 1A). This is the first step for the fabrication of stable and homogenous matrix that can be used as luminescent layers in functional LED devices. On the other hand, we have also explored the spectroscopic and photodynamics of two new Zr-based LMOFs (Zr-NDC/Tz and Zr-NDC/CN), and show how the presence of different nitroaromatic explosive molecules affect their photobehavior (4). In this sense, we have demonstrated that both LMOFs are able to selectively detect trinitrophenol (highly explosive molecule) in presence of other nitroaromatics owing to specific interactions (H-bonds), Figure 1B. Remarkably, these materials can be reutilized for several sensing cycles. All these results reveal the importance of a high-level photodynamics characterization of LMOF in order to boost the development of smarter materials for more efficient nanophotonic applications. If I have time, I will show results on the first report showing the use of MOF in a real OLED (5).

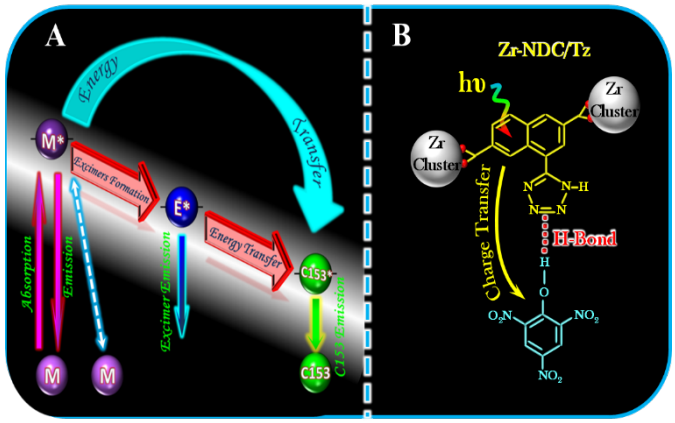

Figure A. Photodynamics scheme of excited C153@Zr-NDC composite embedded in a polycarbonate membrane, where an energy transfer from Zr-NDC to C153 dye is taken place. **Figure B.** Schematic representation of the charge transfer complex formed between Zr-NDC/Tz MOF and trinitrophenol molecule,and which isfavored by H-bond interactions.

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Acknowledgments

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Biography

Abderrazzak Douhal graduated from University Kadi Ayyad (Morocco) is a Professor of Physical Chemistry at the University of Castilla La Mancha (Toledo, Spain). His present research is deserved to the study of photoevents in condensed phase, molecular pockets and pores of chemical and biological systems, advanced hybrid materials based on zeolites, mesoporous materials and metal-organic frameworks, and perovskites-based solar cells using different techniques of ultrafast spectroscopy and single molecule fluorescence microscopy. He has published around 170 scientific contributions, and co-edited three books. He served as a member of the editorial boards of Chem. Phys. Lett., and is being of J. Photochem. Photobiol. A. Chem., and of Inter. J. Photo-energy. He is member of RSEQ, GRUFO, EPA, IUPAC, IAAM and AAAS.

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The potentials and challenges of photovoltaics in the desert regions

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Abstract

Between 2016 and 2030, the primary energy demand of Morocco will be nearlytripled and quadrupled for electric power. Morocco has a vision to clear the way tobecoming a major player in renewable energy, especially solar energy.

It isplanned to deploy more than 10000 MW of renewable energy across the kingdomin the next 14 years. The share of renewable electricity will be 52%, which willoutweigh the share of fossil fuel electricity.

To reach this target, it is very important to characterize the different technologiesand if necessary to adapt them to the specific climate conditions. In this contextand on the one hand, the presentation intends to introduce the Photovoltaic outdoortest platform in the "Green Energy Park", as part of cooperation between theMoroccan Research Institute for Solar Energy and New Energies (IRESEN) andthe German Fraunhofer Center for Silicon Photovoltaics (FhG CSP) and on theother hand, to highlight the potentials and challenges of PV in arid and semiaridregions.

The "Green Energy Park", a unique test, research and training platform has beenestablished by IRESEN and the Polytechnic University Mohammed VI in BenGuerir. These outdoor test platforms are designed, combining a multitude of test-set-ups, in order to investigate and characterize PV modules in harsh weatherconditions and to get valuable data about their performances in situ. Differentsolutions regarding aspects of module improvements, in design and in materialsfor hot Moroccan regions are introduced and will be implemented in differentregions in Africa.

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Biography

Mr. Badr Ikken received an engineer degree in mechanical engineering and industrial production & solar systems from the Berlin Institute of Technology. He wrote a thesis on production technologies of hard materials. During 8 years, he worked in the Berlin Institute for Machine Tools and Factory Management (IWF) as a researcher. In the Fraunhofer Institute for Production Systems and Design (IPK), he served as a project manager for several industrial projects involving companies such as Siemens, INA, Saint-Gobain...

Between 2008 and 2010, Ikken served as CTO of the multinational company Lunos. He developed two new production lines in Germany and expanded the production in China. In September 2010, he joined the Moroccan Agency for Solar Energy (MASEN) as Director of Industrial Integration and R&D. He co-founded the Moroccan Research Institute IRESEN, which he leads since July 2011. He established 2014 the largest solar research platform in Africa, the Green Energy Park.

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Cold plasma processes for surface modification of Materials

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Abstract

Multifunctional effects are essential for producing higher value added materials, important not only for new technical applications but also for more traditional uses. In previous works, it was evidenced that cold plasma technologies can induce several surface modifications of metals, glass, polymers or textiles surface such as change in surface polarity, grafting of chemicals or deposition of functional coatings. The dominant role of plasma-treated surfaces in key industrial sectors, such as microelectronics is well known, and plasmas are being used to modify a huge range of material surfaces, including plastics, polymers, papers, food packaging and biomaterials. In the textile field, significant research work has been going on since the early 1980s in many laboratories across the world dealing with low temperature plasma treatments of a variety of fibrous materials showing very promising results regarding the improvements in various functional properties in plasma-treated textiles.

The growing environmental and energy-saving concerns will also lead to the gradual replacement of many traditional wet chemistry-based textile processing, using large amounts of water, energy and effluents, by various forms of low-liquor and dry-finishing processes. Such modifications are effective to confer new and durable properties to synthetic or natural polymers, without altering their bulk properties. The presentation will give a comprehensive description and review of the science and technology related to plasmas, with particular emphasis on their potential use in the industry. Examples of surface functionalization of materials achieved by means of cold plasma grafting and/or deposition of hydrophilic or hydrophobic coatings, antibacterial, anticorrosion and fire retardant materials will be presented.

Biography

Prof. Charafeddine JAMA presented his PhD Thesis in (1995) at the University of Science and technology of Lille in Surface modification and thin films elaboration. He started his research career since (1990) at the University of Science and technology of Lille as chemical engineer and developed several industrial processes. He is author of more than 110 research papers in international journals. In 1999, he joined the UMET UMR CNRS 8207 laboratory as Professor and he is developing research on new surface modification processes for multifunctional materials, anticorrosion, antioxidant and antibacterial applications. His H-index is 26 on Scopus.

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The Small World of the Phosphazene Chemistry

Ahmed Mazzah

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Abstract

Poly(organo)phosphazenes are a family of inorganic molecular hybrid polymers with diverse properties due to the vast array of organic substituents. This talk will introduce the basics of the synthetic chemistry of polyphosphazenes and the strategies to design and prepare polyphosphazenes with desired properties. It will focus on the recent advances in their chemical synthesis which allows not only the preparation of polyphosphazenes with controlled molecular weights and polydispersities, but also novel branched architectures and block copolymers. We also present the preparation of supramolecular structures, bioconjugates and in situ forming gels from this diverse family of functional materials. The preparation of defined polyphosphazenes with unique property combinations hopefully will stimulate more innovative applications for these multifaceted materials.

Biography

Area of Expertise: Phosphazene chemistry, polysaccharides chemistry.

Prof. Ahmed Mazzah was born at Casablanca (Morocco) in Mai 1960. He obtained his MSc from CaddiAyad University, Marrakech, Morocco, in 1983 and his PhD from the Lille University in 1987. He worked as a post-doctoral research associate with Professor H.W. Roesky at the University of Göttingen in Germany between 1988 and 1990 as Alexander von Humboldt fellowship and then as Professor assistant in the Research Center of the King Fahd University of Petroleum and Minerals in Dhahran in Saudi Arabia between 1991 to 1993. He then joined the department of Chemistry of Lille Institute of Technology in France where he is currently a full professor. He was appointed as head of chemistry department of the institute between 2008 and 2014. His research interests are in the area of inorganic rings and polymers and surface chemistry by cold Plasma.

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Natural products for materials protection

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Abstract

Our ongoing research project is tagged "Natural Products for Materials Protection" (NPMP), and is related to the inhibition of corrosion of iron and steel surfaces exposed to an aqueous aggressive medium by natural products. Specifically, this project focuses on the systematic investigation of some plant extracts as potential sources of benign corrosion inhibiting additives for iron and steel and involves introduction of the extract into the aqueous aggressive medium in order to bring the inhibitor into contact with the surface to be protected. This study is necessitated by the high costs and toxic nature of most common inhibitors and the need to develop a new class of corrosion inhibitors with low toxicity and good efficiency. We herein present some of our findings employing electrochemical a.c. (impedance) and d.c. (polarization) techniques to study the corrosion inhibiting effects of three tropical plant species – *Moringa oleifera* (MO), *Mimosa pudica* (MP), *Dacryodes edulis* (DO) on the acid corrosion of low carbon steel. Impedance measurements revealed that the steel dissolution process was under activation control and all the extracts inhibited the corrosion process by virtue of adsorption. Potentiodynamic polarization data indicate that the extracts mostly behaved as mixed-type inhibitors. The inhibitive actions of the plant extracts have been discussed on the basis of adsorption of protonated and molecular species of the extracts on the corroding steel surface. Density functional theory-based molecular dynamics (MD) simulations were performed to illustrate the adsorption process of the active species of the extracts at a molecular level and the theoretical predictions showed good agreement with the electrochemical results.

Keywords: Mild steel; Materials corrosion; Corrosion protection; Biomass extracts; electrochemical techniques; Molecular dynamics simulation.

Biography

Emeka Emmanuel Oguzie is a Professor of Chemistry at the Federal University of Technology Owerri (FUTO) and leads the multidisciplinary Electrochemistry and Materials Science Research Unit (EMRU: www.emrufuto.com). He holds a Ph.D. in Physical Chemistry from the University of Calabar. He was a visiting (CAS-TWAS) postdoctoral research fellow (2006-2007) and TWAS-UNESCO Associate (2008-2011) at the State Key Laboratory for Corrosion and Protection, Institute of Metal Research, Shenyang China and a Fellow of the OPEC Fund for International Development (OFID). Prof. Oguzie's research interests include corrosion and corrosion control, biomass corrosion inhibitors, computational modeling, environmental electrochemistry, bioresource utilization & occupational hazards management.

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Photo-induced electronic state conversion in metal complexes

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Abstract

Molecules may have flexible structures with easily controlled electronic states. When molecules have accessible electronic states and their structures are flexible upon state changes, such molecular systems can be promising candidates for molecular devises.

Metal complexes with d^4-d^7configurations can have either low- (LS) or high-spin (HS) state, which depends upon their ligand field's strength, and their spin states can be changed with termal variation/lightand such behavior is called as spin crossover (SCO). On the other hand, mixed valence (MV) complexes, of which metal ions have different oxidation states, show an intramolecular electron transfer (ET) between two metal centers.When SCO and MV complexes rest in more than one spin states and valence states, respectively, their states can be converted by external stimula. It is, therefore, expected that multi-component molecules with two SCO or ET sites may show stepped and/or selective state conversions by the synergy of functional components. In this lecture, multi-component systems showing selective spin state conversión, photo-induced SCM, and lability controlled cluster systheses will be presented.

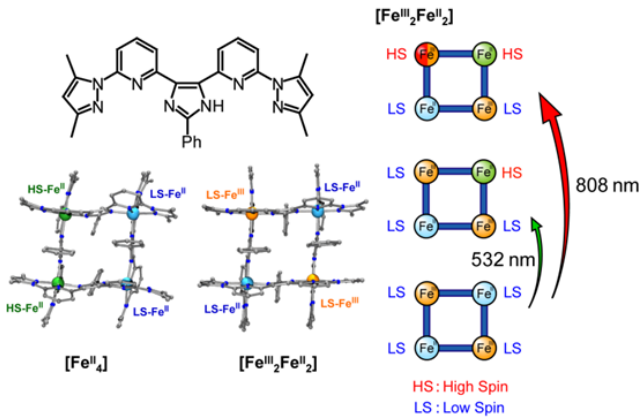

Figure. Homo- and hetero-valence SCO iron complexes with selective spin state conversion

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Biography

Authour graduated from Kyushu University in 1977 and obtained his Ph.D. in 1982. As a postdoctoral fellow, he worked at Marquette University (Wisconsin, USA) between 1982 and 1984, before being appointed as a research associate at the Institute for Molecular Science (Okazaki, Japan) in 1985. In 1992 he moved to Tohoku University as an Associate Professor, where he began his studies of high-spin molecules. In 2001 he was appointed as a Professor at the University of Tsukuba in the Graduate School of Pure and Applied Sciences, where his research has focused on single molecule magnets and bistable multinuclear complexes.

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Green Corrosion Inhibitors: An Old Remedy For New Challenges

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Abstract

The paper discusses various aspects of corrosion inhibitors such as phenomenology, mechanism of corrosion inhibition, factors affecting corrosion inhibition effect of molecular structure on performance of corrosion inhibitors, role of synergism in corrosion inhibition, hard soft acid base HSAB principle, correlation of quantum chemical study in corrosion inhibition .finally the application of corrosion inhibitors in various corrosion environments highlighting the salient features of the research work carried out by the authors has be described.

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Biography

Presently serving as chair professor in Center of Corrosion excellence, Research Institute, King Fahd University of Petroleum and Minerals, Dhahran. 31261, KSA. Previously worked as professor in Indian institute of technology, BHU, Varanasi, India. The focus of current research is on synthesis and design of green corrosion inhibitors. DSc from Aligarh Muslim University. FRSC from UK.

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A practical approach to the validation of qualitative analytical methods

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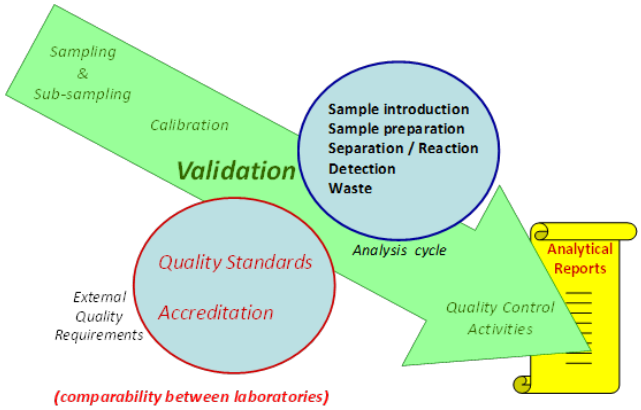
Abstract

Validation is a key activity within the analytical process, and a requirement in the framework of accreditation of analytical laboratories. This is because it is a necessary tool to assure the traceability in chemical and biological methods. Validation involves the assignment of quality properties to a particular analytical method, and to demonstrate the fitness for purposes, mainly. Traditionally, quantitative methods have been the objective of the validation schemes, as the main part of the quality properties involve numbering values (v.i., accuracy, uncertainty, or sensitivity). Nevertheless, qualitative methods are the objective of the validation in many practical situations. In this particular case, numbers are not involved for the evaluation of the performance of qualitative methods. Here, reliability of analytical information must be evaluated in terms of false responses. In this respect, more and more control laboratories use screening methods, which have to be validated following a qualitative procedure. The purpose of this paper is to provide a practical overview of the different approaches to be applied under a general quality management system for laboratories subjected to the norm ISO 17025 and equivalents.



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Biography

Author has his main fields of interest are chemical sensors, miniaturization and integration of analytical systems, the development of screening systems integrating the simplification of sample treatment, as well as the combination of these systems to hydrodynamic instrumental separation techniques, analytical uses of nanomaterials, recently including the determination of nanoparticles in food, agricultural and environmental samples. He has also expertise in metrology applied to qualitative analysis and the Quality Management of Analytical Laboratories. He was warded her PhD in 1983 from the University of Córdoba, Spain. He published more than 300 papers. His H-index is 38 on Scopus.

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Electroactive 2D-Materials: Growth, Properties and Applications

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Abstract

Two-dimensional (2D) materials have attracted much attention due to their unique properties. Controllable synthesis of 2D materials with high quality and high efficiency is essential for their large-scale applications. In parallel to the chemical synthesis route, chemical vapor deposition (CVD) has been one of the most important techniques for the synthesis of 2D materials. For the present talk I will briefly overview our most recent work on CVD growth of graphene*(1)*, boron nitride*(2)*, core-shell nanoparticles@graphene*(3)* and transition metal dichalcogenides (TMDs) including $MoSe_2$*(4)* and WSe_2. In parallel, I will show that the resulting electroactive nanomaterials could be used as electrodes for chemical and biosensing*(6)* as well as hydrogen evolution reaction applications (Figure 1).

Figure. 1: A simple approach to fabricate a vertical aligned porous $MoSe_2$ by two-step coelectrodeposition/ etching method was proposed. The porous $MoSe_2$ nanosheet exhibits a highelectrocatalytic performance for hydrogen evolution.

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Biography

Mohamed Siaj holds the Canada Research Chair in 2D-Materials for Chemical and Biosensing applications since 2016. He received his Ph.D. in Chemistry at Laval University, Quebec, Canada, under the supervision of Peter McBreen. Following postdoctoral training at the Colin Nuckolls group at Columbia University, New York. Siaj joined the Chemistry Department at université de Quebec à Montréal as an assistant professor in 2008, and he is holding the rank of professor since 2012. He is acting as Director of the Research Center on Nanomaterials and Energy (NanoQAM) and Director of Analysis of Materials and Microsystems Regrouping (RAMM), Faculty of Science, UQAM. Prof. Siaj has extensive experience in different areas of surface science and nanomaterials-based graphene. Siaj's group activities focus on the growth, synthesis, processing and characterization of advanced nanostructured electroactive materials and their integration into chemical and biosensors.

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Synthesis of Optical Switches and Natural Products Using Environmentally Benign Methods

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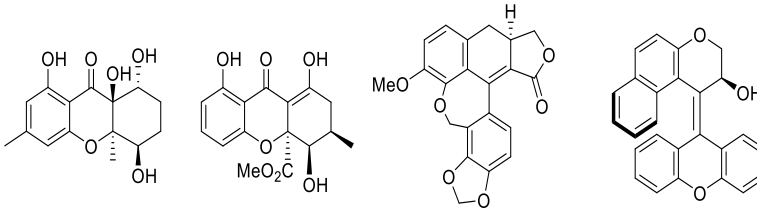
Abstract

The efficient synthesis of natural products, drugs, agrochemicals and materials is a very important aspect in academia and industry. To allow an ecologically and economically favourable approach in a green fashion the former stepwise procedures must be replaced by domino reactions which allow the preparation of complex molecules starting from simple substrates in a straight forward way. Domino reactions[1] allow the reduction of the amount of waste being formed and the preservation of our resources. Moreover, they are also favourable in an economical way since they consume less time.

The usefulness of the domino concept is demonstrated with the syntheses of fungal metabolites[2,3,4] using an enantioselective domino Wacker/carbonylation/methoxylation reaction as well as of natural aryldihydronaphthalene lignans[5] employing a domino-carbopalladation/Heck reaction. The approach has also been applied for the synthesis of novel materials such as molecular switches[6] and fluorescence dyes[7] using a domino-Sonogashira/carbopalladation/CH-activation reaction.

Keywords: Organic synthesis, Natural products, Materials, CH-activation, Pd-chemistry, Enantioselective reactions.



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Biography

Lutz F. Tietze studied chemistry at the universities of Freiburg and Kiel, Germany and obtained his doctorate in 1968 in Kiel. He then worked as a research associate with Prof. G. Büchi at MIT, Cambridge, USA for two years and got his habilitation at the University of Münster in 1975. He got several calls as professor to different universities and has been professor and director of the Institute of Organic and Biomolecular Chemistry at the Georg-August-University in Göttingen since 1978. Tietze has received several awards for example the very prestigious Emil Fischer Gold medal of the German Chemical Society.He has about 480 scientific papers, 38 patents and sixbooks to his name. His research focuses on the development of efficient and selective synthetic methods using domino reactions and the development of new selective anticancer agents employing monoclonal antibodies.

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Toward the development and production of biogas technology in Morocco

نحو تطوير وإنتاج تكنولوجيا الطاقة الحيوية بالمغرب

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الأستاذ أفيلال محمد الأمين جامعة محمد الأول كلية العلوم وجدة المغرب

Abstract

In the framework of the development of modern technologies in the field of renewable energies, improving performance, solid and liquid organic waste in Morocco there are several experiments to produce biogas. Biogas technology is an area of current events, and teaching requires some education to illustrate the various stages and aspects

The development of livelihood experiences to advanced levels will ensure the sustainable development and economic integration, especially in the field of energy and agricultural production, the fact that the biological reactors transformation of organic waste and renewable energy according to the international quality standards.

This study would help to take the decisions of the party officials and investors about the most effective ways to appreciate organic waste in the Arab world.

This presentation will focus on aspects related to the role of the university in building technological capacity, through the following themes:

* Introduction
* the Basics of biogas production from organic waste
* biomass distribution across different parts of the Kingdom of Morocco and biogas energy
* the current status of the biogas technology in Morocco
* appropriate engineering designs for the production of biogas from organic waste

ملخص العرض

في إطار تطوير التقنيات الحديثة في مجال الطاقات المتجددة، وتثمين النفايات العضوية الصلبة والسائلة، توجد بالمغرب عدة تجارب لإنتاج الغاز الحيوي. تطوير هده التجارب إلى مستويات متقدمة سيضمن تنمية مستدامة وتكامل اقتصادي خاصة في مجال الطاقة والإنتاج الفلاحي، لكون المفاعلات البيولوجية تحول النفايات العضوية لطاقة متجددة وفق معايير الجودة العالمية.

هذه الدراسة من شأنها المساعدة على اتخاذ القرارات من طرف المسؤولين والمستثمرين حول أنجع السبل لتثمين النفايات العضوية بالوطن العربي.

في هذا العرض سيتم التركيز على الجوانب المرتبطة بدور الجامعة في بناء القدرات التكنولوجية والتقنيات الحديثة، وذلك عبر المحاور التالية:

- مقدمة حول الطاقة الحيوية
- أساسيات إنتاج الغاز الحيوي من المخلفات العضوية
- خرائط توزع الكتلة الحيوية عبر مختلف جهات المملكة المغربية ومخزونها من طاقة الغاز الحيوي
- الوضع الراهن لتطبيقات تقانة الغاز الحيوي بالمغرب
- التصميمات الهندسية الملائمة لإنتاج الغاز الحيوي من المخلفات العضوية

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Organic, Inorganic and Nanomaterials

Oral presentations

One-dimensional study of TiO_2/SiO_2 and Si/SiO_2 photonic crystals for applications in thermophotovoltaic devices

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Abstract

This paper presents a one-dimensional study of two photonic crystal structures (Si/SiO_2 and TiO_2/SiO_2) for applications in thermo photovoltaic optical filters. The performance of the proposed structures comprises 8 periods each. The infrared radiation included is in the wavelength range of 300nm to 900nm for the visible and from 800nm to 2000nm for the IR. The limiting temperature of this system is 2000 K. The transfer matrix method is used to analyze the behavior of the frequency for a structure comprising a layer of defects. The behavior of the peak of light transmission when the period and angle of incidence change is also observed. It was subsequently found that the band gaps of the Si/SiO_2 structure were wider than those of the TiO_2/SiO_2 structure.

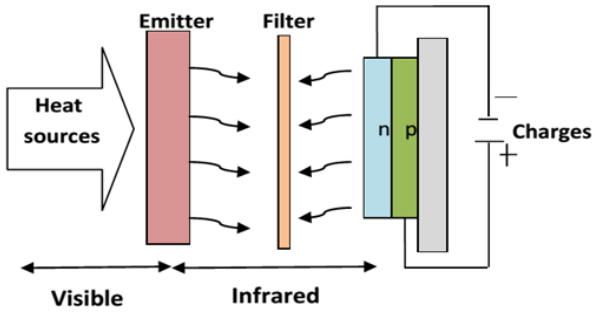

Fig. General diagram of a system thermophotovoltaic system

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Biography

Author has his expertise in Energy systems and the Environment, with specific focus on Renewable Energy for sustainable development. She was awarded his PhD Degree in 2010 from the University of Yaoundé I, Cameroon. He is the Renewable Energy Department Head at the National Advanced Polytechnic School of the University of Maroua in Cameroon. He published more than 35 papersin international refereed journals.

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Synthesis of nanocomposites and their applications related to environment and energy

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Abstract

Owing to shortage of fossil fuels and to fulfil rapid growth of energy demand, it becomes essential to explore new energy resources. Moreover, the level of CO_2 is increasing day by day which cause environmental pollution as well as global warming. Designing a suitable photocatalyst which solve both these issues is always remains a challenge. In the present work, we have tried to design such heterostructure that can be efficiently helpful in solving both these problems. The hydrothermal method has been used for the synthesis of Bi_2S_3 and CeO_2 while their nanocomposite (Bi_2S_3/CeO_2) has been prepared by two step chemical method. X Ray diffraction (XRD) analysis confirm the formation of synthesized materials. High Resolution transmission electron microscopy (HRTEM) and Scanning electron microscopy (SEM) show that Bi2S3 are in rod shape while CeO_2 are in spherical particles which are well distributed in nanocomposite forming a heterostructure. The oxidation states of the elements and valence band position has been confirmed by the X-ray Photoelectron Spectroscopy (XPS). All these materials (Bi_2S_3, CeO_2 and Bi_2S_3/CeO_2 nanocomposite) has been used as photocatalysts for the reduction of CO_2 under visible light ($\lambda \geq 420$nm). Bi2S3/CeO2 nanocomposite gives higher yield of methane and methanol than that of Bi_2S_3 and CeO_2. The stability of Bi_2S_3/CeO_2 nanocomposite has been checked. The results indicate that incorporation of Bi_2S_3 with CeO_2 not only leads to the visible light photocatalytic conversion of CO_2 in to methane and methanol but also show better stability of nanocomposite than that of single semiconductor.

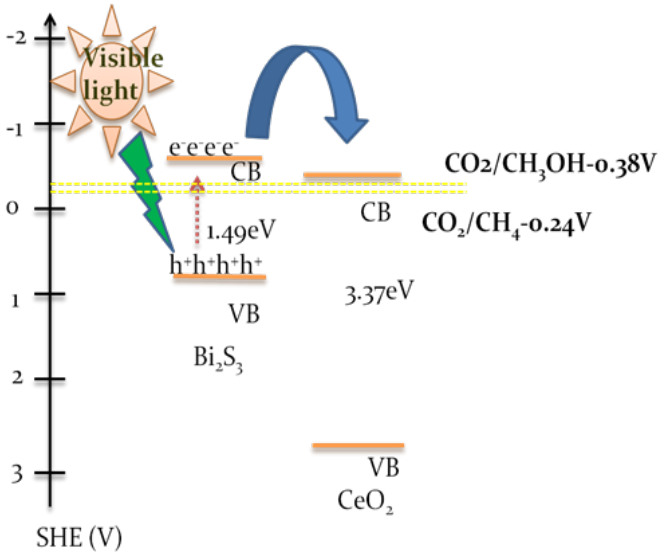

Figure: Alignment of the energy levels and proposed scheme for the photoreduction of CO_2 with Bi_2S_3/CeO_2 Composite under irradiation of $\lambda \geq 420$ nm.

Biography

Dr. Ashiq has expertise in the synthesis of nanomaterials and their applications related to photocatalysis and energy storage devise. He was awarded hid PhD degree in 2009 from qauid-i-azam university, Islamabad, Pakistan and Post doc from NCNST, Beijing, China. He has published more than 116 papers in journals of international repute. His H-index is 22 on scopus. He has been awarded with research productivity awards in every year from 2008 to 2017 including in A and B categories.

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New potential applications of mondentate and polydentate pyrazolic ligands and their theoretical investigations

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Abstract

Pyrazole is a five-memberedring heterocyclic compound containing three carbons and two adjacent nitrogen in the positions 1 and 2. It was described for the first time by Ludwig Knorr in 1883 [1].

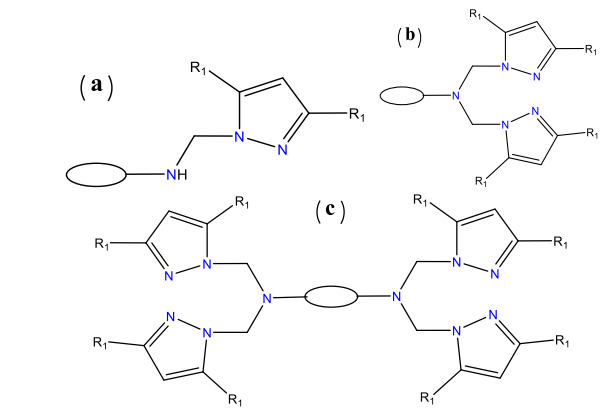
This small molecule is a core structure of different natural products, which the first molecule levo-β-(1-pyrazolyl) alaninewas isolated from Citrullus Vulgaris seeds in 1959 by Japanese researchers Noe and Fowden[2].

The access to the Pyrazole derivatives has been extensively studied by the researchers after the first syntheses described by Knorr [3] and Pechmann [4].

A.Ramdani was the first person who is working about pyrazole derivatives in 1980 in Faculty of sciencesoujda, he prepared many new monodentate, bidentate, tridentate and macrocyle pyrazolic ligand [5].

These methods take advantage of the vast number of commercially available starting materials containing functional and aliphatic or aromatic amines. The structural and the electronic diversity of pyrazolic compounds open many and potential applications such as inhibitor of corrosion [6], many biological properties [7], efficient extractants of heavy metals [8], and catalysis [9], these applications will be highlight too.

Structure of our pyrazolic ligands



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Biography

Author has his expertise in synthesis of heterocyclic ligands based of Pyrazole, Triazole and their theoretical investigations using GAUSSIAN 09W. He is a second year PhD student from the University of Mohammed premier, Oujda Morocco. He published three papersabout tridentate pyrazolic ligands in his first year of study.

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Structural, optical and electrical properties of 0.97($PbTiO_3$)-0.03($LaFeO_3$) solid solutions

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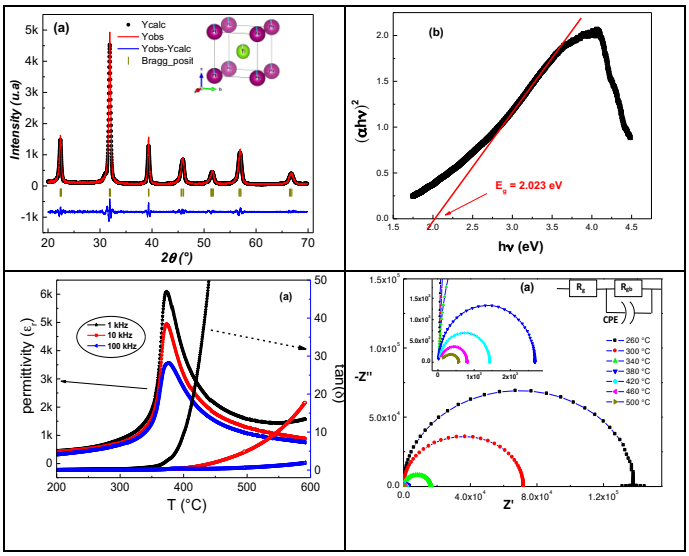
Abstract

Lead titanate ($PbTiO_3$) modified by lanthanum iron oxide ($LaFeO_3$) powder was prepared by sol-gel process with a stoichiometric formula 0.97($PbTiO_3$)-0.03($LaFeO_3$). The calcined sample at 700 °C during 2h was structurally characterized using x-ray diffraction, Rietveld refinement and Scanning electron microscopy. It is shown that the sample exhibits a tetragonal single phase with a space group of (P4/mmm). The optical band gap determined using UV-vis spectrum was found to be 2 eV. The compound exhibits high dielectric constant and low dielectric loss. Simultaneous analysis of impedance and electrical conductivity allows to extract electrical parameters in wide ranges of frequencies and temperatures. Activation energies calculated from both conductance and relaxation time were comparable high-lighting the same origin of conductivity and relaxation process. The temperature dependence of resistivity shows that this ceramic could be one kind of thermistor with exponential negative temperature coefficient of resistance in wide temperature window of 260–540 °C. Resistance–temperature features were described by thermistor equation with thermistor constant and thermal coefficient of resistance.



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Biography

I have my expertise in evaluation and passion in improving the functional ceramics used in capacitance and photovoltaic applications. Myfocus is based on the synthesis and characterization of perovskites and similar kinds of alloys and compounds to optimize their physical and chemical properties. I was awardedmy PhD in 2009 from the University of Sidi Mohamed Ben Abdallah, Fez, Morocco. I published more than 12 papers. My H-index is X on Scopus.

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Biomimetic oxidation of catechol employing complexes formed *in-situ* with Bi-sallenes ligands and metallic salts

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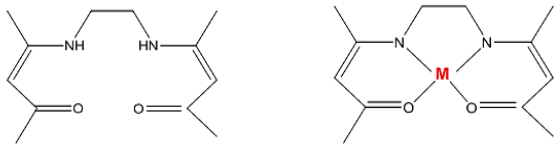
Abstract

In this work, we will presnte the catalytic properties of the complexes formed *in-situ* with the bi-sallenes ligand; 4-[(2-{[(1E)-1-methyl-3 oxobutylidene] amino} ethyl) imino] pentan-2-one; and different metallic salts, which aimed to memic the active site of catechol oxidase**.** In order to determine factors influencing the catecholase activity of these complexes, the effect of ligand concentration and the nature of solvent have been studied.

Also we compared the potentialities of the complexes formed in situ as well as the synthesized complexes, as catalysts of the oxidation reaction of catechol to o-quinone.

Image: Structure of ligand and de complex



Ligand

Complex

M=Ni, Cu, Co

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Biography

Author has her expertise in catalysis.She is a second year PhD student from the University of Mohammed premier, Oujda Morocco.

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Notes/Comments

The authors extend their appreciation to the **PPR2-MESRSFC-CNRST-P10** project (Morocco) for its supporting this work.

Ecological oxidation of simple and terpenic olefins catalyzed by Co-Ag supported on ZnO

Abderrazak Aberkouks[1], Soufiane El Houssame[2], Larbi El Firdoussi[1], Mustapha Ait Ali[1]

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Abstract

The catalytic oxidation of hydrocarbons in the chemical industry is one of the most reliable techniques that have attracted attention in the field of catalysis. On the other hand, for the production of fine chemistry, in recent decades, many works have been carried out in the field of catalysis using stoichiometric amounts of inorganic and organic catalyst[1].

The increase in environmental awareness has resulted in the banning of such processes and stimulated the development of catalytic alternatives[2]. Heterogeneous catalysis is preferred over homogeneous catalysis in the oxidation dominator, since heterogeneous catalysts can be recycled and reused in the following processes[3].

The objective of our work is the preparation of supported transition metal catalysts such as Ag, Co, and Zn and the application of these in the oxidation of simple and terpenic olefins. The application is a useful ecological process for the selective catalytic oxidation of styrene to benzaldehyde, using H_2O_2 as oxidant. The reaction occurs in mild conditions and various ratio of Co-Ag supported on ZnO have been evaluated to optimize the reaction conditions and used as recyclable catalysts.

Keywords: Heterogeneous catalysis; allylic oxidation; natural terpenes.

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Study of the catalytic properties of copper (II) complexes prepared *in-situ* with monodentate ligands for the oxidation of catechol

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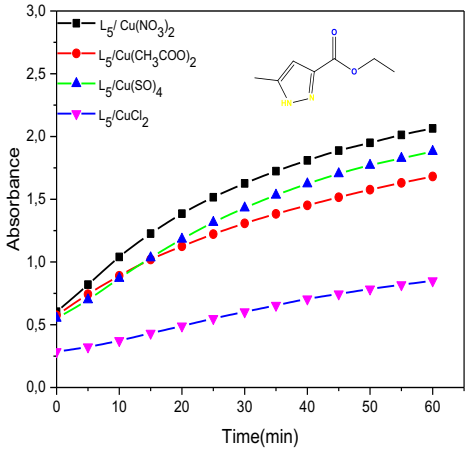
Abstract

Biomimetic chemistry has developed to mimic bio-organic processes in natural enzymes and understand their mechanisms of action. The development of biomimetic catalysts requires a very good understanding of biological systems, where coordination is essential for the selectivity of reactions, and where the presence of a cosubstrate allows the supply of electrons necessary for the activation of oxygen. The objective of our work is the research and discovery of new catalysts for a known organic reaction, such as the oxidation of alcohols and phenols. In this work we want to examine the catalytic properties of the complexes prepared in-situ based on monodentate ligands with copper (II) salts in the oxidation reaction the catechol in the o-quinone with oxygen under mild conditions. The best activity of catechol oxidation is given by the combination formed by one equivalent of ligand **L5** and one equivalent of $Cu(NO_3)_2$ in methanol solvent which is equal to 15.21 µmol L^{-1} min^{-1} for catechol and 32.63µmol L^{-1} min^{-1} for ter-butyl-catéhol . The Michaelis– Menten model is applied for the best combination, to obtain the kinetic parameters, and we proposed the mechanism for oxidation reaction of catecholase.



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Biography

Titi abderrahim student in PhD first year at the faculty of Science, University of Mohammed premier Oujda Morocco My research is about preparation of new ligands and their application in catalysis..

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Effect of annealing temperature on the structural, physical, chemical, and wetting properties of copper oxide thin films

Naoual Al armouzi, Mustapha Mabrouki, Noureddine Kouider

Laboratory of Industrial Engineering, Faculty of sciences and technology, University Sultan Moulay Slimane, Beni Mellal.

Abstract

Copper oxide (CuO) is a semiconductor with direct wide band gap 1.2 eV [1], with many useful properties (electrical, catalytic, optical...). A wide range of applications such as photovoltaic [2], gas sensor [3], photo catalytic [4], Etc. Makes it the most studied in the last decade materials, especially when it is developed in the form of nanostructures [5].

In this work, we focus on the synthesis of CuO nanowires. Using the contact angle goniometer, the water contact angles for CuO thin film is measured. The contact angles were studied to see the effect of the temperature on the wettability of the CuO film which proved to be hydrophilic in nature.

The structural and morphological characterizations were made by atomic force microscopy (AFM) and an X-ray diffraction (XRD). According to the results, the effect of the annealing temperature can be seen; it plays an important role in physical, chemical, structural and morphological properties of the CuO thin films thus prepared.

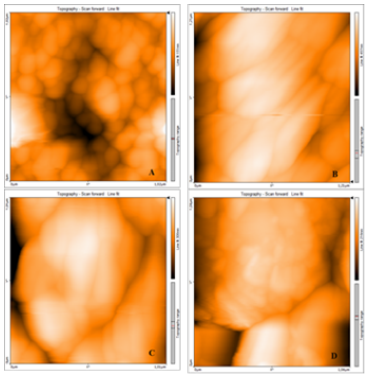

Figure: AFM images for Cu annealing in a) 300°C, b) 400°C, c) 500°C and d) 600°C

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Biography

Author is a PhD student in the fifth-year from the University of Sultan Moulay Slimane, Beni Mellal in Morocco. She published two articles on elaboration of copper oxides (CuO), and study of its physicochemical and morphological properties.

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Effectofmicromechanics models on bending and free vibration of functionally graded beams

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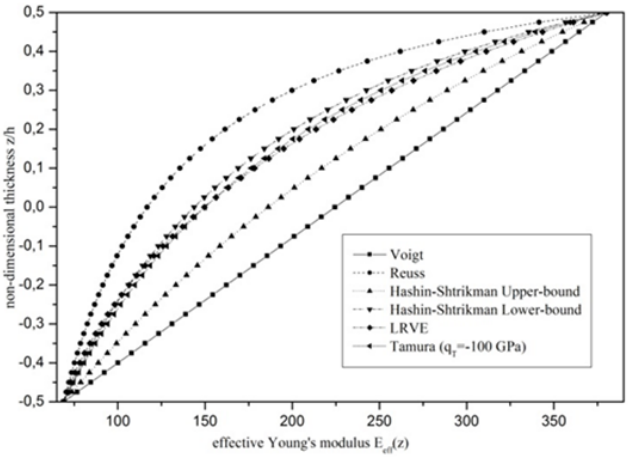
Abstract

In this paper, the effect of the micromechanics models on bending and free vibration is presented for functionally graded beams (FGM). The majority of investigations developed in the last decade, explored the Voigt micromechanics model to predict the effective proprieties of functionally graded materials at the macroscopic-scale for functionally graded beams responses. For this reason, various models have been used to derive the effective proprieties of FGMs and simulate thereby their effects on the bending and free vibration of FGM beams based on comparative studies that may differ in terms of several parameters. The refined beam theory, as used in this paper, is based on dividing the transverse displacement into both bending and shear components. This leads to a reduction in the number of unknowns and governing equations. Furthermore the present formulation utilizes a sinusoidal variation of displacement field across the thickness, and satisfies the stress-free boundary conditions on the upper and lower surfaces of the beam without requiring any shear correction factor. Equations of motion are derived from Hamilton's principle. Analytical solutions for the bending and free vibration analysis are obtained for simply supported beams. The obtained results are compared with those predicted by other beam theories. This study shows the sensitivity of the obtained results to different micromechanics models and that the results generated may vary considerably from one theory to another. Comprehensive visualization of results is provided. The analysis is relevant to aerospace, nuclear, civil and other structures.



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Biography

Author has main research interest in composite materials and structures, with the focus on theory formulation, characterization and mechanical properties of advanced Composites. He was awarded her PhD in 2015 from the University of Sidi Bel Abbes., Algeria.

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New dyes for DSSC containing bridged thienylen-phenylene: a theoretical investigation

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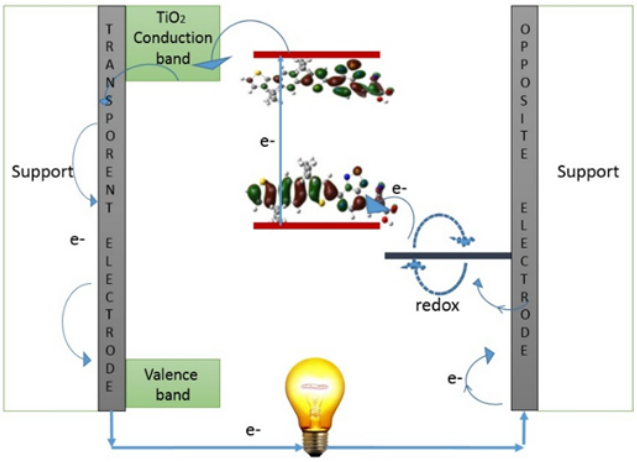
Abstract

Dye Sensitized Solar Cells show the most promising future of photovoltaic cells due to their environmental protection, simple synthesis and low cost. The dye sensitized is the key factor for the development of this photovoltaic cells. In this work, a theoretical study on six organic π-conjugated molecules based on bridged thienylen-phenylene, with electron acceptor group 2–cyanoacrytic for all dyes.The quantum methods at density functional theory (DFT) and its extensible time dependent-density functional theory (TD-DFT) are used in this study. A different unit based on a series of X moieties (e.g. [1,2,5]Thiadiazolo[3,4-c]pyridine) were introduced as a bridge. However, the electronic structure; The HOMO, LUMO and the key parameters in close connection with the short-circuit current density (Jsc), including light-harvesting efficiency (LHE), injection driving force (ΔG^{inject}) were discussed. In addition, the estimated values of open-circuit photovoltage (Voc) for these dyes were calculated. The results of these dyes reveal that they can be used as a potential sensitizer for TiO_2nanocrystalline solar cells due to their promising electronic and optical properties and good photovoltaic parameters.



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Biography

Abdelkrim Amkassou, received his Master's degree in Materials Engineering, Energy and Environment from The Faculty of Sciences, IbnZohr University of Agadir, Morocco, in 2015. He is currently a PhD student in Faculty of Science, IbnZohr University of Agadir, Morocco, His research interests include renewable energies and materials of photovoltaic cells.

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Ruthenium(II) diamine complexes incorporating azoimine ancillary ligands. Synthesis, spectral, crystal structure and DFT calculations and catalytic activity in the hydrogenation of α,β-unsaturated aldehyde

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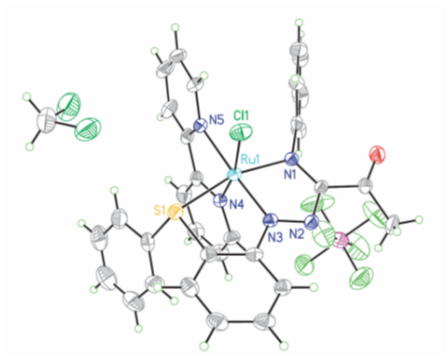
Abstract

Six ruthenium complexes bearing phenylazo-(2-(phenylalkyl))phenylmethine ligands of the general type $[Ru^{II}(bpy)(L)(Cl)_2]PF_6$ (*C1-C6*) {L = (2-SR)C_6H_4N=NC(COCH$_3$) =NC_6H_4X, L1, C1, X = H, R = Ph; L2, C2, X = CH_3, R = Ph; L3, C3, X = F, R = Ph; L4, C4, X = NO_2, R=Ph; L5, C5, X = H, R=CH_3; L6, C6, X = H, R=H} and $[Ru^{II}(phen)(L1)(Cl)]PF_6$ (*C7*) have been synthesized. The crystal structures for C1 is reported and show that the ligands are bind to ruthenium centres as NN'S tridentate ligands. Furthermore, these complexes have been characterized through spectroscopic (IR, UV/Vis. and NMR) and electrochemical (CV) techniques. The redox properties and electronic excitations in the complex are interpreted by DFT and TDDFT calculations. Catalytic activity for the hydrogenation of α,β-was investigated.



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Biography

Author has her experience Synthesis and physical characterization of organometallic metal complexes and Design complexes with suitable oxidation potential to oxidize some organic substrates.

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Structural characterization of pure and doped Tricalcium phosphates prepared by solid state method

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[2] Istituto di Cristallografia – CNR, Via Salaria Km 29.300, 00016 Monterotondo (Rome), Italy.

Abstract

Tri-calcium $Ca_3(PO_4)_2$ phosphate materials (TCP) show interesting biological and optical properties for its use in applications related with luminescence and biomaterials field . The purpose of this study is to synthesize tricalcium phosphate powders with dual dopants of trivalent lanthanides (Ln= La, Pr, Nd, Eu, Gd, Dy, Tm, Yb) and divalents transition metals (M=Mn,Ni) by a conventional solid state reaction at high temperature with $CaCO_3$, $CaHPO_4$, Ln_2O_3 and metal oxides as precursors. Structural modifications of doped elements into β-TCP structure were investigated. The so-obtained (Ln-TCP) and (M-TCP) powders were characterized using X-ray diffraction (XRD), Fourier Transform InfraRed (FTIR) and Raman spectroscopy. These compounds crystallized with whitlockite-like structure (space group R3c) of β-$Ca_3(PO_4)_2$.

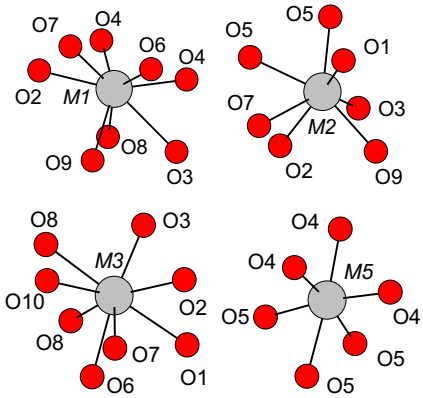

Fig: M1, M2, M3, M5 cationic sites within present Ln β-TCP phosphates.

Biography

Asmaa El KHOURI phd student in laboratory of inorganic sciences and their applications at faculty of sciences semlalia Marrakech morocco, I work on calcium phosphates synthesis and characterization and their optical, biological applications , I had a master in analytical chemistry and bachelor in inorganic chemistry

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Investigation of corrosion inhibition effect of imidazopyridinederivatives as inhibitors on carbon steel in molar hydrochloric acid media

Elhachmia Ech-chihbi[1, 2], R. Salim[1, 2], H. Oudda[1], F. El Hajjaji[2], M. Taleb[2]

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Abstract

The use of inhibitors is one of the most frequently used methods for reducing degradation of metal in contact with an aggressive media. The effect of imidazopyridine derivatives for carbon steel in acidic environment (HCl 1.0 M) has been investigated in the temperature range from 298 K to 338 K by potentiodynamic polarization measurements and electrochemical impedance spectroscopy (EIS).The inhibition efficiency increased with increase in inhibitor concentration but deceased with rise intemperature.Polarization studies showed that the compounds behave as mixed type inhibitor in the aggressive media. Theadsorption of these inhibitors was found to obey Langmuir adsorption isotherm. The adsorption of the studied compounds on mild steel surface was found to be both physisorption and chemisorption but predominantly chemisorption.The kinetic and thermodynamic parameters for C-steel corrosion and inhibitor adsorption, respectively, were determined and discussed. Scanning electron microscopy studies revealed the formation of protective films of the inhibitors on mild steel surface.

PGZ 100 VoltaLab Radiometer Analytical potentiostat controlled by the VoltaMaster 4 software

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Biography

ECH-CHIHBI Elhachmia has expertise in the corrosion inhibition studies. His interests are focused on the use of different methods to evaluate the inhibitive proprieties of new compounds in acidic solution. He started his PhD studies in 2015 at the University Ibn tofail, Kenitra, Morocco in the laboratory of separation processes (LSP) and Laboratory of Engineering, Electrochemistry, Modeling and Environment (LIEME). She published 5 papers; Her H-index is 2 on Scopus.

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QSAR models to predictantiproliferative activity by studying imidazo[1,2-a]pyridine and imidazo[1,2-a]pyrazine derivatives

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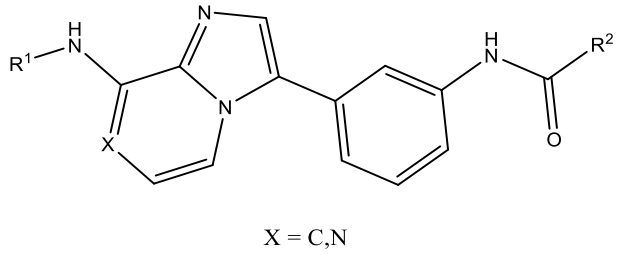
Abstract

Quantitative Structure Activity Relationship (QSAR) models play an important role in the pharmaceutical industries by discovering new drugs and predicting their activities [1-2]. In this study, we developed a QSAR model to predict the antiproliferative activity of diarylamide and diarylurea derivatives containing imidazo[1,2-a]pyridine or imidazo[1,2-a]pyrazinescaffold, previously studied as inhibitors of the B-RAF (Rapidly Accelerated Fibrosarcoma) [3], a protein that play a key role in the regulation of cellular proliferation, survival and apoptosis [4-5]. The QSAR analyses including Multiple Linear Regression (MLR), Principal Component Analysis (PCA), Neural Network (NN) and cross-validation methods, were performed on a set of 107 imidazo[1,2-a]pyridine and imidazo[1,2-a]pyrazine derivativesas B-RAF inhibitors. The model developed in this study provides significant results (r_{MLR} = 0.74; r_{NN} = 0.94 and r_{CV} = 0.87) and was validated using the leave-one-out procedure, therefore it could be used to predict the antiproliferative activity for new inhibitors.

Image



General structure of imidazo[1,2-a]pyridine and imidazo[1,2-a]pyrazine derivatives

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Biography

PhD student in LIMME,Faculty of Sciences Dhar El Mahraz-Fez, University of Sidi Mohammed Ben Abdellah, Morocco. My research is focused on the application of QSAR modeling in biological field.

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Creep of the agarose gel

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Abstract

Agarose is a biopolymer extracted from the red marine alga (Rhodophycées), it is widely used in agribusiness, pharmaceutical industry or as electrophoresis. The Solution of this biopolymer in water gives rise to a more or less rigid solid mass called gel.

This gel can be described as a matrix generating a macromolecular three-dimensional network.

In this work, we exploit the experimental measurements of the stress undergone by the gel and the underlying deformation as a function of the different concentrations to determine the creep function of this polymer in a linear regime according to the Boltzmann superposition principle.

It turns out from the calculations that the gel is subjected to a delayed elasticity governed by Voigt's analog model. This model allowed us to find the elastic modulus of the gel, in addition, he were follows the determination of the delay time and the viscosity as functions of agarose concentrations.

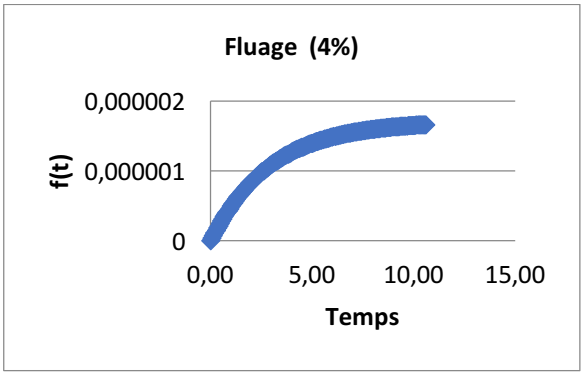

Figure 1: Creep function for a concentration of 4% agarose

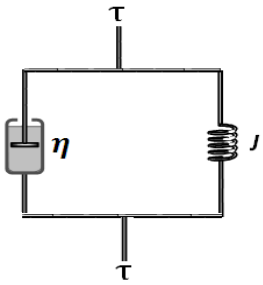

Figure 2: Voigt Model

Figure 3: Agarose powder

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Biography

The author Ed-daoui Abderrahim has a fundamental theoretical master in science of physical matter entitled optics and materials. Currently, I am enrolled in the third year of the PhD program under the scientific supervision of M.Benelmostafa and M.Dahmani. Thesis title: molecular dynamic modeling of agarose .

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Experimental and Theoretical Tools for corrosion inhibition studies for mild steel in hydrochloric acid Medium by new Indanones derivatives

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Abstract

The anti-corrosive behavior of some Indanones derivatives (A1), (A2) and (A3) on the mild steel in HCl 1M acid medium are tested experimentally using gravimetric measurements, Tafel polarization and electrochemical impedance spectroscopy (EIS) methods, the theoretical study by using the density functional theory (DFT).

For each species we found that, the corrosion inhibitors for mild steel in HCl 1M solution are excellent: in the presence of 10^{-3} M at 303 K the efficiency of inhibition of A1, A2 and A3 are respectively in the order of 91,76%; 87,41% and 89,93% , the adsorption on the metal surface obeys to Langmuir isotherm and the potentiodynamic polarization studies revealed that the investigated compounds behaves are mixed-type. Impedance data were analyzed by equivalent electric circuit and revealed a frequency distribution of the capacitance, simulated as constant phase element. The DFT calculation (B3LYP in combination of the 6-31G (d, p) basis set) are also applied for the determination of structural parameters of A1,A2 and A3, the results of weight loss are in and were in reasonable agreement with electrochemical studies.

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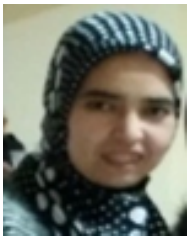
3. R. Salim, E. Ech-chihbi, H. Oudda,Y. EL Aoufir, F. El-Hajjaji, A. Elaatiaoui, A. Oussaid, B.Hammouti, H. Elmsellem and M. Taleb Der PharmaChemica, 8 (2016) 200-213

Biography



ASMAE SAADY Has an expertise experimental and theoretical tools for corrosion inhibition studies on the mild steel in aggressive mediums by compound organic. She will discuss her phd dissertation on 2018 in the university of sidi Mohamed Ben Abdellah, Fez, Morocco She has one published paper in Der Pharma Chemica.

Ceramics materials from low grade magnesite

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[1] Laboratory of Physical Chemistry of Applied Materials (LPCMA), Department of Chemistry, Faculty of Sciences Ben Msik, Hassan II University of Casablanca, Morocco
[2] Geomaterials and Geo environment Team / Geo-Biodiversity and Natural Patrimony Laboratory, (GEOBIO) / Geophysics, Natural Patrimony and Green Chemistry Research Centre (GEOPAC), Scientific Institut, Mohammed V University in Rabat (Morocco)

Abstract

Processing of magnesia based ceramic by unidirectional dry pressing from Moroccan magnesite is described. The samples were sintered up to 1350°C to study the ceramics properties. After appropriate processing, the prepared specimens were fired at various temperatures up to 1350 °C. The ceramic materials resulted after firing, were investigated regarding their phases composition, structural characteristics and physical properties of technological interest. On this way the production of materials having interesting properties such as shrinkage (range of 9.15 % to 12.41 %), porosity (range of 26.91 % to 19.53%), density (range of 1.95 to 2.11 g/cm^3), flexural strength (range of 27.6 – 31.5 MPa) and thermal conductivity (range of 2.72 – 2.87 W/mK^{-1}), at high temperatures are achieved.

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Biography

Chaouki SADIK : Professor of geomaterials and traditional ceramics at Faculty of Sciences Ben-Msik (Hassan II University of Casablanca, Morocco). His focus is based on the technological characterization of industrial rocks and minerals (clays for pottery and industrial ceramics, silica sand for glassworks, perlite, bentonite, etc.), the elaboration and characterization of traditional and refractory ceramics. He published more than 10 papers.

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Synthesis and characterization of Cellulose-Acrylamide derivatives Elaborated in Alkali Medium usable in water treatment

Sara Chaouf[1], Hassan Amhamdi[1], Soufian El Barkany[2], Issam Jilal[3], Chahid Zannagui[1], Hussein El Ouarghi[4], Abderahmane El Idrissi[5]

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Abstract

In the last few years, science and technology have made remarkable discoveries in the field of bio-renewable materials. In recent years, cellulose continued to build the new environmentally friendly industrial base. Indeed, cellulosic derivatives have frankly all the industrial sectors started by the pharmaceutical industry to the plastic, functional and smart materials. The objective of this work is to propose new bio-based flocculants by elaboration of new water-soluble cellulose derivatives Cellulose-acrylamide (Cac) with different degree of substitution DS. Cellulose modified by the aqueous systems $NaOH/H_2O$/Urea. Then the synthesized products were characterized by spectroscopic methods XRD, FTIR, TGA… Flocculation proprieties was tested by colloidal solution of $Fe(OH)_3$ in different concentration of flocculent that shows a hight effencity of clarification.

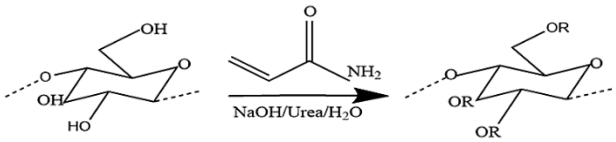

Figure: schematic reactions of the elaboration of Cellulose-acrylamide

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Biography

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Micro-structural effects on the corrosion resistanceof mild steels in industrial pickling hydrochloride acid

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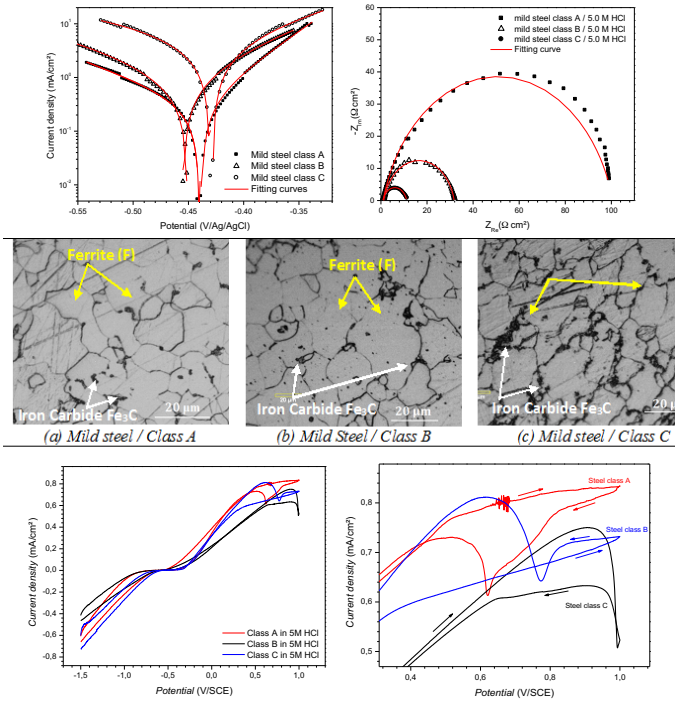
Abstract

Mild steel remains an important engineering material frequently applied in construction, chemical, power production, automobile and electrochemical industries due to its abundance at relatively low production cost. Above all, mild steel possesses unique and remarkable mechanical properties such as good strength, toughness, ductility, formability and weldability, which confirm its suitability as a better construction material in comparison to other engineering materials [1–3]. Steels is widely used as a structural material. In a galvanizing process, metal structure will be pickled in hydrochloric acid tank after the degreasing operation and before pre-fluxing. Acid pickling removes the iron oxides or scale from the steel's surface to expose a bare area and permit a galvanized coating to form upon immersion in a molten zinc bath. Over-pickling of metal leads to affect expected properties. In fact, lacking in surface preparation of mild steel, thus causing simultaneous wear and fatigue at the surface and subsequently breakage [4]. Furthermore, mild steels are susceptible to ravages and failure depending on the environmental conditions causing deterioration of material surfaces, a phenomenon called corrosion. Corrosion causes gradual weakening and failure of material properties, which can sometimes lead to human injury, loss of life and collateral damage.

We have reported in a recent study the effect of silicon and phosphorus contents in mild steel on its corrosion inhibition in 5.0 M HCl solution in the presence of Cetyltrimethylammonium-bromid/KI [5]. The experimental results have showed that the corrosion inhibition depended of the steels composition according to their silicon and phosphorus contents.

The micro-structural effects on the corrosion resistance of three classes of mild steels (A, B and C) suitable for galvanizing industry according to their silicon, phosphorus content, grain number and size of carbides (Fe3C) in concentrated hydrochloride acid solution was investigated by a series of known techniques, such as potentiodynamic polarization curves (PP), electrochemical impedance spectroscopy (EIS) measurements, optical microscope and scanning electron microscopy.

Results showed that corrosion rate of the three classes of mild steel depended on the steels composition according to their silicon, phosphorus content. It is found also that the corrosion rate depended on grain number and size of carbides content in mild steels. This finding was confirmed by microstructural characterization techniques.



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Biography

YounesEL KACIMI was born in Azrou City, Morocco. He received his B.Sc. in Polymer Sciences (2006) & (D.E.S.A) M.Sc. degree in Biomaterials Sciences (2008), from Ibn Tofail University, Kenitra, Morocco. Then he started to M.Sc. degree in Quality & Project Management (2009) from François Rabelais University, France. He was awarded his PhD education in Physical Chemistry (2016), from Ibn Tofail University, Kenitra, Morocco. His main research interests are in the field of Physical Chemistry, Especially electrochemistry (Corrosion and corrosion inhibition in industrial media for metals and alloys using various techniques). Younes has authored one Patent, two Book,five Book chapter and many others publications in corrosion engineering.

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The corrosion inhibition mechanisms by two organic compounds H1 and H2: Electrochemical, DFT and Monte Carlo simulations studies

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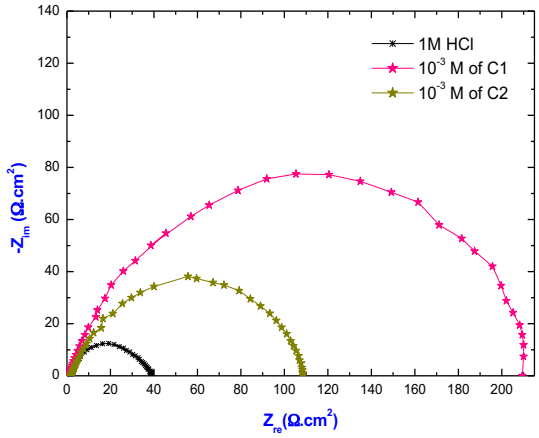
Abstract

The corrosion inhibition properties of two new synthesized organic inhibitors, namely H1 and H2 for C-steel in 1M HCl were studied by using the density functional theory, molecular dynamics simulations, and electrochemical techniques. Experimental results show that both H1 and H2 behave as mixed-type inhibitors. These inhibitors increased the charge transfer resistance and concurrently lowered the double layer capacitance, with a higher efficiency for H2 confirming its high potentiality to protect metal against dissolution.

Experimentally, the adsorption of the inhibitors on the surface of carbon steel in 1.0 M HCl solution was found to obey Longmuir's adsorption isotherm. Surface morphology of mild steel was examined using Scanning Electron Microscopy (SEM) in both the absence and presence of inhibitors out to understand the corrosion inhibition property of two inhibitors. On the other hand, the mechanism of inhibition action of the two studied compounds was discussed in the light of the DFT and molecular dynamic simulations studies. Theoretical results agree well with the experimental results experimental results obtained.



EIS diagram of 10-3M concentration of H1 and H2 compared to Blank.

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Biography

In order to prevent the undesirable effects of Acid washing used in many industrial fields and to minimize excessive metal corrosion, corrosion inhibitor addition was the most convenient and cost-effective approach to improve the corrosion phenomenon. The author analyzed the anti-corrosive efficiency of two organic compounds in acid meduim by several methods. She is a third year PhD student in the laboratory of Materials and Environment Engineering (LGME) Faculty of Sciences, Fez, Morocco.

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Improvement of Corrosion Resistance of Mild Steel in Hydrochloric Acid Medium by new Triazole derivative

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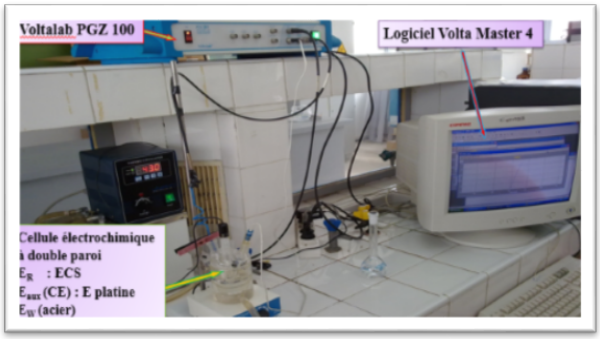
Abstract

The study of the corrosion inhibition of metals in acid solutions is an important industrialtopic. Acidic solutions especially hydrochloric acid solutions (HCl), are widely used invarious industrial processes, such as oil well acidification, acid pickling, acid cleaning, andacid descaling, which generally leads to serious metallic corrosion [1].

Heterocyclic compounds constitute a potential class of corrosion inhibitors. Compoundscontaining both nitrogen and sulphur atoms in the same molecule are of particular importanceas they provide better inhibition efficiency as compared to compounds containing nitrogenand sulphur alone [2-4].

In continuation of work on heterocyclic compounds [5], we have investigated the effect ofnew triazole namely (Z)-4-((2bromobenzylidene)amino)-5-methyl-2,4-dihydro-3H-1,2,4-triazole-3-thione (2i) as corrosion inhibitor on the corrosion of mild steel in 1 M HCl solution using potentiodynamic polarization, electrochemical impedance spectroscopy (EIS) technique and optical microscopy. The (2i) has significantly inhibited mild steel corrosion in 1M HCl solution and the inhibition efficiency increased with (2i) concentration. Potentiodynamic polarization results showed that (2i) was a mixed-type inhibitor and the highest efficiency is obtained at 10^{-3}M of (2i). The obtained data from EIS measurements were analyzed to model the corrosion inhibition process through an appropriate equivalent circuit model. The effects of temperatures on the inhibition efficiency of (2i) were also tested attemperature of 318K and 348K respectively. (2i) is adsorbed on the steel surface according to a Langmuir isotherm adsorption model. Optical microscope image confirmed the absence of corrosion product on the metal surface in the presence of (2i) inhibitor. The results obtained showed that the (2i) could serve as an effective inhibitor of the corrosion of mild steel in hydrochloric acid medium.

Keywords: new triazole ,hydrocarbon chains, carbon steel, corrosion inhibition, hydrochloric acid



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Biography

Author has his expertise in evaluation and passion in the use of inhibitors to protect metals against corrosion especially in acidic medium. Its goal is based on the use of its organic molecules to have applications in industries. She is a PhD student in the third year at the Laboratory of Separation Processes, Ibn Tofail University, Faculty of Sciences, Kenitra, Morocco.

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Impedance spectroscopy analysis of Ca doped $BaTiO_3$ ferroelectric ceramic manufactured with a new synthesis technique

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Abstract

Nanocristalline ceramic powders of $Ba_{1-x}Ca_xTiO_3$ (x=0- 0,20) have been prepared using the sol gel process with preheating of gel dry with microwave(MW) before calcination. The aim of the present paper is to study the effect of preheating with MW on both structural and dielectric properties of Ca doped $BaTiO_3$.The phase structures of the ceramics at room temperature were characterized by X-ray powder diffraction (XRD) and Raman scattering, which indicate that BT and BCT ceramics present a tetragonal structure, and Ca^{2+} occupied the Ba^{2+} and Ti^{4+} sites. Wide ranges of frequency (20 Hz to 1 MHz) and temperature (280–400 °C) dependence of the impedance relaxation were investigated. The impedance study indicates the presence of dielectric relaxation effects in bulk and grain boundary in the samples. The relaxation times for grain and grain boundary estimated from Cole–Cole plots varied with temperature according to the Arrhenius relation. The activation energy for grain and grain boundary were estimated using cole-cole and modulus. The values of activation energy suggest that the conduction may be the result of defect and charge carriers present in the materials.

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Biography

SALHI agrège en sciences physiques, enseignant de sciences physiques en CPGE à Fès. Actuellement je prépare mon doctorat en science des matériaux au Laboratoire de Physique Théorique et Appliquée (LPTA) à la FSDM- Fès sur les matériaux à base de Titanate de Baryum. J'ai publié (avec l'équipe) un article dans ce domaine.

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QSAR and Theoretical Evaluation on the Inhibition effect of Some Thiophene Derivatives for the Corrosion of Mild Steel in Acidic Media

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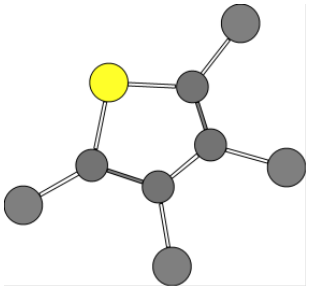
Abstract

Corrosion Inhibition effect of some thiophene derivatives viz 2-methylthiothiophene (MTT), 2-thiophene sufonyl chloride (TSC) and 2-macaptothiophene (MT) were study using Quantitative Structure Activity Relationship (QSAR) andQuantum chemical calculations method. The results showed that QSAR model was built from two important molecular descriptors that is SpMax_Bh3(m) as an edge adjancy descriptor which is responsible for the connectivity between edges of the molecule and gives information on bonds and MATS4M as autocorrelation descriptor which explain the effect of branching and nonlinearity. Base on this descriptor the inhibition efficiency from the model follow the order of MTT, 72.3, TSC, 68.2 and MT, 62.3% respectively. Quantum chemical calculations using Density Functional Theory (DFT) with Becke three parameter- Lee -Yang and Parr (B3LYP) /6-311G++ (d,p) was used to confirm the effect based on molecular level using quantum chemical descriptors and the results was found to be consistent with predicted result by QSAR model.



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4. **Bishir Usman**, HasmeryaMaarof, Hassan H. Abdallah, Madzlan Aziz., *Bajopas* 10(1) (2017) 590-590.
5. Farida Umar Ahmad , Bukar A**. Bishir Usman**, Ismail M.N., *J. Mater. Environ. Sci.* 10 (1) (2017) 280-284

Biography

Bishir's research focuses on the development of theoretical and computational methods and models to study chemical processes that are related to materials science, corrosion studies, Quantitative Structure Activity Relationship, Molecular Mechanics, Molecular Dynamics, Molecular Docking, use of QSAR for Prediction of different types of molecular properties which are validated using experimental approach and Response Surface Methodology for optimization of different descriptors to enhance the performance and yield of chemical process. Also conducted a research on Kinetics of Biogas production, Biodiesel, Bioethanol, Bio-hydrogen for energy production, Surface Chemistry includes applying capillary rise method to study surface tension of various liquid concentrations to monitor chemical reactions, Electrochemistry, Solid State chemistry. He obtained PhD in 2015 from the UniversitiTeknologi Malaysia. Many paper in ISI and Scopus index.

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Fabrication of $K_2O–MnO–P_2O_5$ glasses for chemical and mechanical applications

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[4]Université Mohammed V de Rabat, Ecole Normale, Supérieure Takadoum, Laboratoire de Physico-Chimie des Matériaux associé à l'AUF (LAF 502), Rabat, Morocco.

Abstract

Homogeneous phosphate glasses having the general formula K_2O-MnO-P_2O_5 were synthesized using a melt-quenching method. The amorphous nature of the samples was asserted by X–ray diffraction. The glasses are studied in order to evaluate the influence of MnO addition on the chemical and mechanical properties, such as, dissolution rate, average compressive strength (Rc), Young's modulus (E) and limit strain (ε_{lim}). Some studies show that the addition of MnO significantly reduces the degradation rate (D_R) of soluble phosphate glasses and enhanced chemical stability of both alkali-resistance and acid-resistance. MnO interfere with the chemical structure of the glass, and consequently improve their mechanical properties. Indeed, the mechanical measurements showed that the glass structure was modified by the addition of MnO oxide, becoming more rigid, and as a result, increasing the compressive strength (Rc), Young's modulus (E). These new materials could be an important opportunity for applications in the fields of building, construction, civil engineering, etc…

Keywords: Phosphate glasses, mechanical properties, chemical durability, compressive strength, elastic modulus, strain limit.

Inhibition effect of raw clay (GHASSOUL) on brass corrosion in 3%NaCl medium and influence of purification

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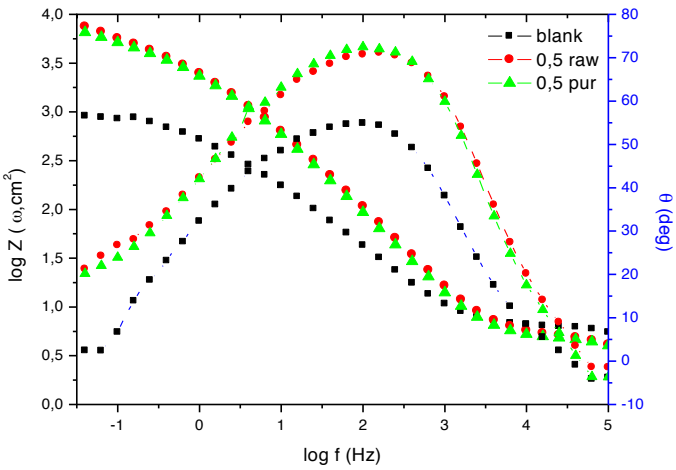
Abstract

Controlling corrosion of cooper alloys such as brass, which is widely used in marine industry, is of a great interest for researchers and scientists. We focus on this present work on green inhibitors which are friendly to the environment and also because of its low cost. Clay becomes a material of choice as corrosion inhibitor and as it reservoir in corrosive medium. The effect of this clay (GHASSOUL) on the corrosion of Cu-36Zn alloy (brass) in 3٪NaCl medium was studied.

Electrochemical techniques such as potentiodynamic polarization and Electrochemical Impedance Spectroscopy (Nyquist, Bode Magnitude and Bode Phase), were used. The optimal concentration of the studied inhibitor (0.5g/l raw clay) was evaluated at five different temperatures and for different immersion times and compared to the same concentration of the purified clay in order to determine the influence of purification. Thermodynamic and kinetic parameters were calculated for the adsorption process.

Chemical composition of the brass specimen and Solutions was done by Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES) which confirmed the corrosion inhibition of brass by minimizing it dezincification when using the optimal concentration. Clay was analyzed by X-Ray Diffraction (XRD) and (ICP-AES) techniques.

Surface morphology was characterized by Scanning Electron Microscopy (SEM) coupled with Energy Dispersive X-ray (EDS) analysis.



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Biography

Ben seddik Nordin get his Master degree in general chemistry in 2015 from the University of Abdelmalek Essaadi, Tetouan , morocco. Since then, he is currently investigating the corrosion inhibition of brass in corrosive mediums by green inhibitors. He participated to (the first Arab conference on plants in FES, morocco) and (International colloquy of Young Researchers in Tetouan, morocco). Interested to electrochemical and theoretical techniques which describe the protection process.

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Spinel structure positive electrode material with huge electrochemical performances for lithium-ion batteries.

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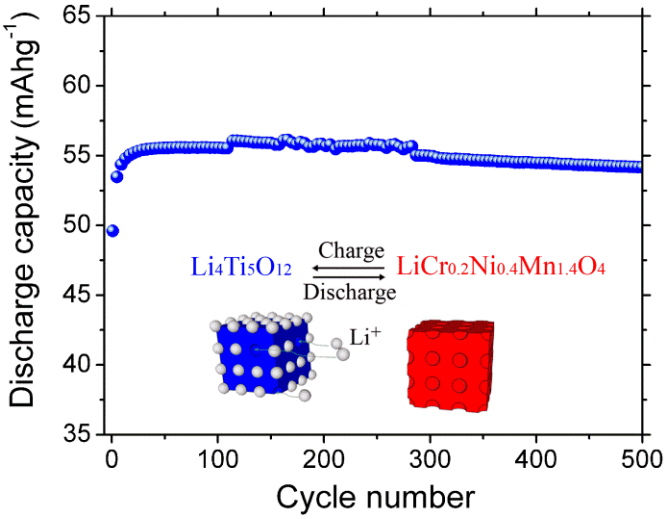
Abstract

The increasing demand for wireless devices from one hand, and the growing awareness of the society regarding the use of clean energy from another hand, made the issue of energy storage one of the biggest challenges of the 21st century. Lithium-ion batteries are meant to be the technology accomplishing these tasks. Being the technology most used to give mobility to electronic devices, they are thought to be the best way to provide energy to electric vehicles and plug-in hybrid electric vehicles. Therefore, money and effort are still being invested to enhance their properties. Recently, we published the results of the synthesis of a cathode material which general formula is $LiCr_{0.2}Ni_{0.4}Mn_{1.4}O_4$ and with spinel structure. This material exhibited the highest rate capability reported for LNMO-based cathodes to date, at both 25 and 55°C testing temperatures. The $LiCr_{0.2}Ni_{0.4}Mn_{1.4}O_4$ spinel was synthesized by combustion method and the resulting powder was annealed at different temperatures to obtain samples with particle size from ~60 to ~3000nm and then the influence of this difference in size on the electrochemical properties was studied. Among the samples synthesized, the submicrometric particle size exhibited the best electrochemical properties; i.e. this sample keeps 92% of Q_{max} for 60C at 25°C, and 87% at 55°C. It can store 663 $Whkg^{-1}$ and deliver 31000 Wkg^{-1} at 25°C, and 654 $Whkg^{-1}$ and 27500 Wkg^{-1} at 55°C. In addition, remarkable cycling performances (capacity retention after 250 cycles >96%) were obtained. Furthermore, we showed the importance of the mass balance in a $LiCr_{0.2}Ni_{0.4}Mn_{1.4}O_4$ //$Li_4Ti_5O_{12}$ full cell on its electrochemical performance. The full cell showed different cycling behaviors depending on the discharge rates. However, the full cell exhibited an outstanding ultralong cycling behavior: with a capacity retention of 93% after 1000 cycles. These results and more will be shown and explained in detail during the ICMES.



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Biography

PhD. Mohamed Aklalouch has his expertise in developing and improving the electrochemical performances of the materials used as anode or cathode in lithium-ion batteries. His focus is based on the improvement of the properties of the spinel structure materials and especially the LNMO-based materials to provide high energy and high power for an important application such as electric vehicles (EVs) and plug-in hybrid electric vehicles (PHEVs). He was warded his PhD in 2010 from the University Cadi Ayyad of Marrakesh, Morocco. And He worked for several years in the Institute of Science of Materials of Madrid (ICMM) and then the one of Barcelona (ICMAB). He is now a professor and a researcher at the Faculty of Sciences and Technology in Marrakesh. He published more than 10 papers in journals with index factors over 5 and his h-index is 6 on Scopus.

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New organic dyes based on benzothiadiazole for photovoltaic applications Solar Cells

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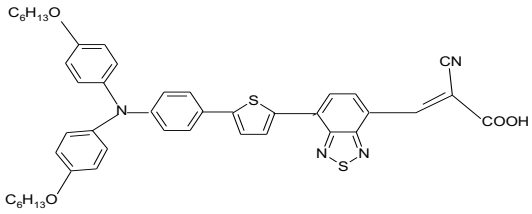
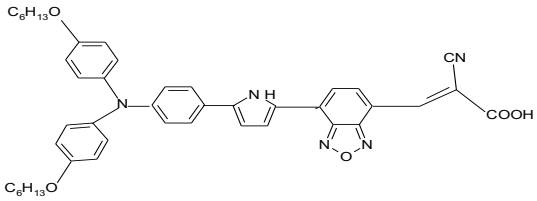
Abstract

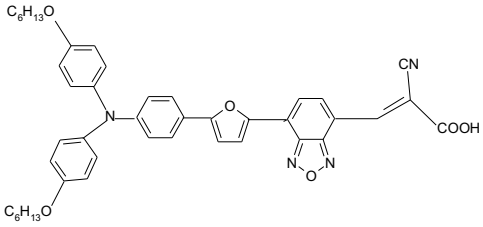
Series of four organic dyes based on benzothiazole with structure (D-π-(D-A-)-A) were studied using DFT / DFT (TD-DFT) / 6-31G (d, p). The structural, electronic and optical properties of these dyes (D1, D2, D3 and D4) was reported. The electronic and photovoltaic parameters such as the short-circuit current density (Jsc), the efficiency of light harvesting and the highest injection force (ΔG^{inject}) and other important parameters will be discussed in this work.



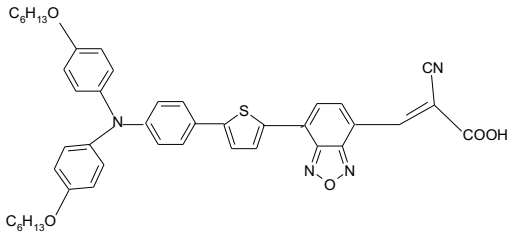
D1



D2



D3



D4

Fig. 1: Chemical structure of studied compounds Di (1-4)

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Biography

Rchid Kacimi has expertise in the study of molecular materials of various structures based on pi-conjugated systems for applications in organic electronics. PhD student in Chemistry, Moulay Ismail University, Faculty of Sciences, Meknes, Morocco. He has published two articles in two international journals.

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Formulation and physical and chemical characterization of a new material type PSA coating

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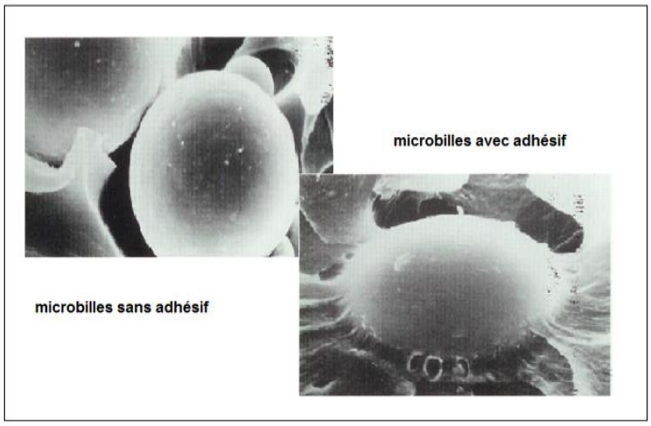
Abstract

The challenges of sustainable development are based on major balances between three main components: Economical, Environmental and Societal [1]. The energy sector is one of the essential pillars for the success of these balances and it is confronted with several problems that it faces: A growing demand, the increasingly apparent consequences of global warming, scarcity of water resources and pollution ... etc. In the face of these serious problems, to reduce energy consumption has become an international concern. The building sector consumes a very large share of energy. Today, this sector is a priority target through actions limiting energy losses, thanks to the scientific and technological development of new materials specifically designed to limit heat transfer and improve the insulation of buildings, particularly through the development or optimization of coatings [2]. The determination of the thermal coefficients of a coating to improve the comfort it offers, always requires insulation tests and practical measures based on the calculation formulas described in the international thermal standards [3]. The aim of this work is to involve the formulation of an adhesive with hollow glass microspheres and its physical and chemical characterization to develop a new coating improving the temperature of comfort felt (also called "operating temperature" or "dry resultant temperature") defined by: Operative T ° = (T ° air + T ° walls) / 2 [5]. Two types of microbeads were used, they differ in their densities and the distribution of their sizes, they have white free-flowing powder appearance. The tests were carried out on two different adhesive compounds (acrylic solvent adhesive with a dry matter percentage of 37.5% and an emulsion of which the percentage of dry matter is 50%). The different tests used allowed us to verify, on the one hand, the stability of the microbeads and, on the other hand, the effect of the latter on the coating of a uniform coating and on its viscosity [6].



Optical microscope of hollow glass microspheres with and without synthetic resin an adhesive.

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Biography

Chemical engineer at the University de Travail, having 11 years as professional experience of production engineer. In the 2nd year of a Phd at the Laboratory of Engineering Electrochemistry of Modeling and Environment in the university Sidi Mohamed Ben Abdellah

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5-(((4-chlorobenzylidene)amino)methyl)-8-hydroxyquinoline –A novel inhibitor for the corrosion inhibition of carbon steel in hydrochloric acid solution

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Abstract

Corrosion and corrosion inhibition of carbon steel electrode were investigated in 1 M HCl using electrochemical techniques. The corrosion inhibition characteristics of 5-(((4-chlorobenzylidene)amino)methyl)-8-hydroxyquinoline have been studied as an inhibitor for corrosion control of carbon steel electrode in 1 M HCl corrosive solution using potentiodynamic polarization and electrochemical impedance spectroscopy (EIS) techniques. The results of the electrochemical techniques revealed that this compound is very good corrosion inhibitor. The corrosion inhibition mechanism of the protective layers is also discussed. The adsorption of this compound on metal surface obeyed Langmuir's adsorption isotherm. Polarization measurements showed that this compound acted as mixed inhibitor in HCl solution and the inhibitor molecules followed physical adsorption on the surface of carbon steel.

Keywords: Corrosion inhibition; Carbon steel; HCl; Potentiodynamic polarization; EIS; Quinoline derivative.

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Photo-curing kinetics of hydroxyethyle acrylate (HEA): Synergitic effect of dye/amine photoinitiators systems

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Abstract

Visible-light activated photoinitiators have recently been paid a considerable attention [1,2]. This is mostly due to the less-harmful character of this light and its higher penetration compared to ultraviolet light. The numerous advantages of this technology including solvent-free formulations, rapid curing at ambient temperatures and low costs , have led to many important applications such as pigmented coating paints, dental adhesives, holographic records, inks and electronics [3-5].

The key component in visible-light photo-polymerization process is the photo-initiator, which consisting of a dye as photo-sensitizer and an amine as co-initiator.

The present work is focused on the study of the photochemical reactivity of some dye /amine systems, acting as photo-initiators for the photo-polymerization of hydroxethyl acrylate (HEA) under soft conditions. For this purpose, the dye/amine photo-initiator were formed from Acridine Orange (AO) or Methylene Blue (MB) acting as photo-sentisizers. The Triethanolamine (TEOA), Ethyl 4-(dimethylamino) benzoate (EDMAB), Trioctylamine(TOA), and N,N-Diméthylallylamine (DMAA) were used as co-initiators. The UV-visible study of the photo-transformation of dyes underlines the important photo-reactivity of acridine orange (AO) and methylene blue (MB).

The photo-polymerization kinetic of the HEA monomer in the presence of the proposed dye/amine systems was examined using UV-visible and FTIR analysis and the synergetic effect of the dye/amine on the efficient of the photo-polymerization was established. Interestingly, methyl blue/ ethyl 4-(dimethylamino) benzoate (MB/ EDMAB) system show the better reactivity, with a total conversion of HEA monomer.

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Biography

Author has her expertise in Preparation and characterization of several kinds of polymers (polyelectrolytes and polymer liquid crystal) , investigation of phase separated dispersions of nano-and micron-sized liquid crystalline domains in polymers (morphology, structure, thermodynamics, kinetics of polymerization/crosslinking and phase separation, experimental and theoretical phase properties, electro-optical behaviour of polymer dispersed liquid crystal PDLCs; chemically crosslinked polymer networks (synthesis, characterization, swelling/deswelling studies); photochemistry of polymers (ultraviolet irradiation, electron beam bombardment, polymerization/crosslinking processes, grafting, ….) She was warded her PhD in 2015 from the University of Tlemcen (Algeria).

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Application of oligomeric micelles-functional magnetic nanoparticles for extraction of aromatic amines from textile

Naous Mohamed[1], Farida Bouanani[2], Soledad Rubio Bravo[3]

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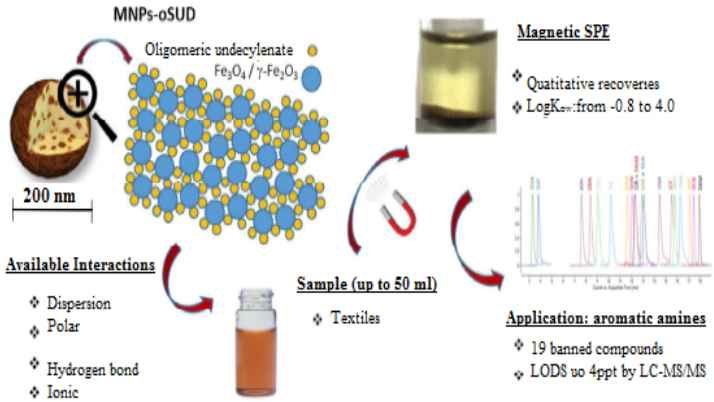
Abstract

Magnetic solid-phase extraction based on iron oxide nanoparticles (MNPs) has received increased attention over the past few years because of its simplicity and its easy and rapid isolation of analytes from samples using a magnetic field. A major general advantage of "surfmers" for magnetite nanoparticles (MNP) functionalization is the maintenance of the micellar structure during chemisorption, which results in magnetic sorbents that offer regions of different polarity for solubilization while keeping intact their structure during solute elution.We have shown in this work the great extraction capabilities exhibited by the hitherto unexplored combination of magnetic nanoparticles and oligomeric micelles. The proficiency of these sorbents to expand the usually restricted range of extractable polarity from log K_{ow} values above 4 up to highly hydrophilic negative values has been proved by the extraction of 19 aromatic amines in textiles, prior to their determination by LC-MS/MS. The method, suitable for the routine determination of aromatic amines in these types of samples, is simple, robust. Extraction took 5 min and absolute recoveries for 17 aromatic amines in samples were in the range 93-123%.



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Biography

Author is assistant Professor of Chemistry at Tiaret Univerity in Algeria. He began his PhD studies in 2011 at Oran University. His relation with Cordoba research group of fine chemistry started in February 2015, where his research is focused on the development of new supramolecular solvents and adsorbents (functionalized magnetic nanoparticles). She was wardred his PhD in 2017 from the University of Oran, Algeria. She published more than 4 papers. Her H-index is 3 on Google Scholar.

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Comparative study of zinc and lead addition effect on structure- properties of phosphate glasses

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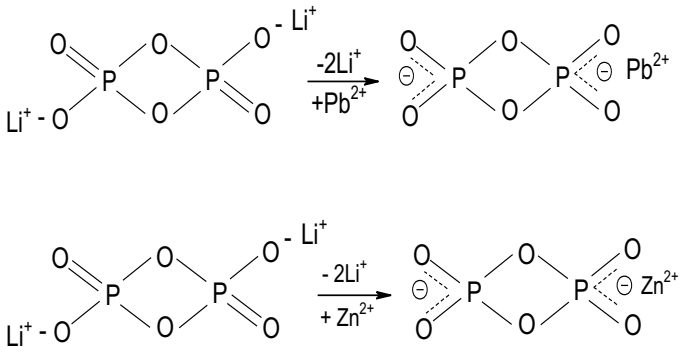
[3] Ibn TofaılUniversity, FSK, Laboratoire de Physico-Chimie des Matériaux et Environnement, B.P., 133, 14000 Kénitra, Morocco.
[4] Mohammed V University, ENS Takaddoum, Laboratoire de Physico-Chimie des Matériaux Inorganiques et Organiques (LPCMIO), B.P. 5118, Rabat 10000, Morocco.

Abstract

The purposeof this study was to compare a range of phosphate-based glasses of two groups of glasses with compositions (35-x)Li_2O–xPbO–15ZnO–50P_2O_5 (0≤x≤35 mol% of PbO) and (35-x)Li_2O–xZnO–15PbO–50P_2O_5 (0≤x≤35 mol% of ZnO)containing a fixed amount of (50 mol%) of P_2O_5, modified by the addition of PbOand ZnO respectively. Their thermal analysis, density, molar volume and infrared spectroscopy studies were conducted in order to compare the data obtained from both series glasses. Thermal analyses revealed a slight difference in the glass transition temperatures obtained between the two groups. The density values increased linearly with increasing PbO and ZnO contents for two series, whilst the molar volume decrease non-linearly with ΔV_m = 2.39 cm^3/mol for the addition of PbO and ΔV_m = 5.94 cm^3/molfor the addition of ZnO. FTIR spectra reveal the formation of P–O–Pb and P–O–Zn bonds in these glasses and show that metaphosphate network is not affected when PbO and ZnO contents increase in both groups. Thus, PbO and ZnO are assumed to play an intermediate role in a way that Pb^{2+} and Zn^{2+} cations tend to break P–O–P bonds forming PbO_4 and ZnO_4 units with covalent Pb–O and Zn-O bonds(Figure in opposite). The predominant structural units in both series glasses are metaphosphate $(P_2O_6)^{2-}$ groups.



(a) creation of non-bridging oxygen by Li_2O
(b) reorganization of P–O bonds to include two P–O–P links in $P_2O_6^{2-}$ units with $Pb^{2+}$and Zn^{2+}four-coordination in both series

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Biography

M. Abid has his passion in improving the phosphate glasses. Hisfocus is based on the use of phosphate to have application in different field. He was warded her PhD in 2000 from the Ibn TofailUniversity of Morocco. He published more than 10 papers. His H-index is 4 on Scopus.

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IMPORTANCE OF USING INORGANIC ADDITIVE AND ADJUVANT IN THE CEMENT INDUSTRY

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Abstract

The reduction of greenhouse gases emission is the main issue the cement industry is facing now and will be facing in the near future. In the light of this, the use of the so-called secondary cementitous materials is mandatory for all modern cements. Among other types of chemical additions, grinding agent represent one of the most promising, due to availability and hydraulic behavior. By using response surface methodology, we discussed and modeled, the reactivity of the effect of amino alcohol based grinding agents in blended cement, on grinding time, carbon dioxide emissions rate, and physico-mechanical parameters such as compressive strengths. The results obtained are compared with those of an ordinary inorganic additive (fly ash) in order to produce high-quality, environmentally-friendly cement at a lower cost and emit CO_2.

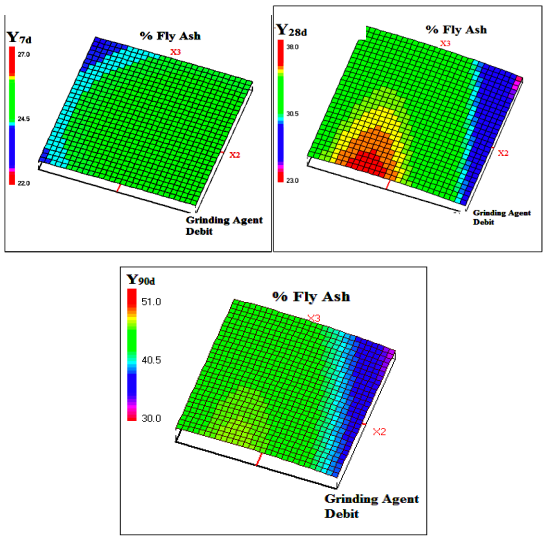

Figure: Contour plots of the compressive strength at 7, 28 and 90 days according to % fly ash and milling agent flow rate

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Biography

NourElHouda MTARFI has her expertise in improvement of the cement quality and evaluation of the cement additions effects. Her focus is based on the use of fly ash and milling agent to have application in cement field. She was awarded his PhD in 2018 from University of Sidi Mohamed Ben Abdellah, Fez, Morocco. She published 11 papers.

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External electric field effect on exciton binding energy in GaAs /GaAlAs cylindrical quantum dots with asymmetric axial potential

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Abstract

The present study investigates theoretically the role of electric field in an asymmetric axial potential on the exciton binding energy and photoluminescence energy in cylindrical quantum dot (QD). Using a variational approach and the correlation between the electron and hole in the trial wave function within the effective-mass approximation, we calculate the exciton binding energy of the ground state and the photoluminescence energy as the function of the geometry and the strength of the applied electric field along the growth direction of the cylinder. Our numerical findings for $GaAs/Ga_{(1-x)}Al_{(x)}As$ have shown that the binding energy is decreasing functions of the electric field strength. Also, we have found that the exciton binding energy is decreasing function of the QD height with and without electric field effect. Furthermore, the photoluminescence energy depends on the effects of electric field, the geometrical confinement and the aluminum concentrations in the barrier materials.

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Self-Assembly and Controlled-Release with Sustainable, Nacre-like Functionalized Chitosan Thin Films

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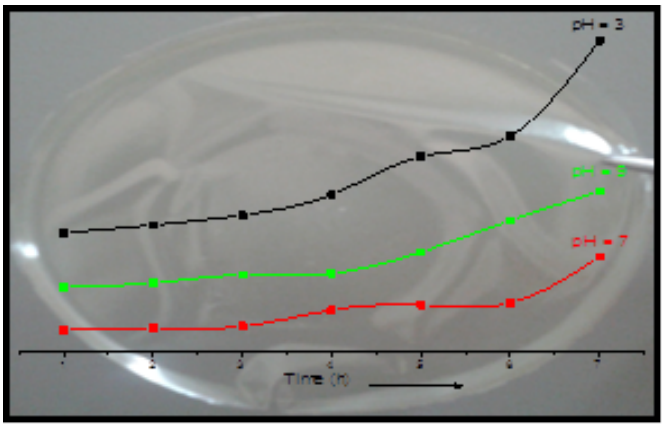
Abstract

Chitosan is a cationic linear polymer derived from chitin. Produced naturally by living organisms. Considered an environmentally friendly polymer, have many applications, as an agent for mobilizing certain molecules (for example: drugs, pesticides, Perfumes). In this context, anhybrid films of chitosan-montmorillonite, transparent and flexible, functionalized with aromatic aldehydes, that act as a new generation of controlled chemical release bioplastics and respectful of the environment were presented. These modified organic-inorganic nanomaterial films in which the oxygenated groups on the grafted aromatics interact preferentially with the Schiff's base belonging to the carbohydrate via an imine-C=N- intramolecular bond between the amine of chitosan and the aldehyde carbonyl either with the hydroxyl groups belonging to the surface of the clay via an intermolecular bond Si-O ... HO-Ar. Theexfoliation of clay nanoparticles sheets by chitosaninfluence the functionalization of the imine bond reversibility(C = N) invery precise parameters. These chitosan-aldehyde interactionswith or without montmorillonite which allows to have functional materials for the drugs release in medical and biomedical applications.



Acknowledgments

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Biography

Jamal CHABBI, 4th year PhD student, Faculty of Sciences and Technologies Cadi Ayyad University, Marrakesh, Morocco. Currently preparing thesis in organic chemistry and development supervised by Prof. Lahcini Mohammed (Faculty of Sciences and Technologies, Marrakesh) and Prof. Abdelkrim El kadib (Euro-Med University of Fez). He is working on the valorization of chitosan polymer as a biodegradable polysaccharide aiming to prepare heterogeneous supports and modified films for catalytic applications and food packaging. The thesis work has so far resulted in a publication in the journal "Carbohydrate polymers" on Thompson reuters.

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New modified CMC /MMT nanomaterial used in the removal of acid dye in aqueous solution

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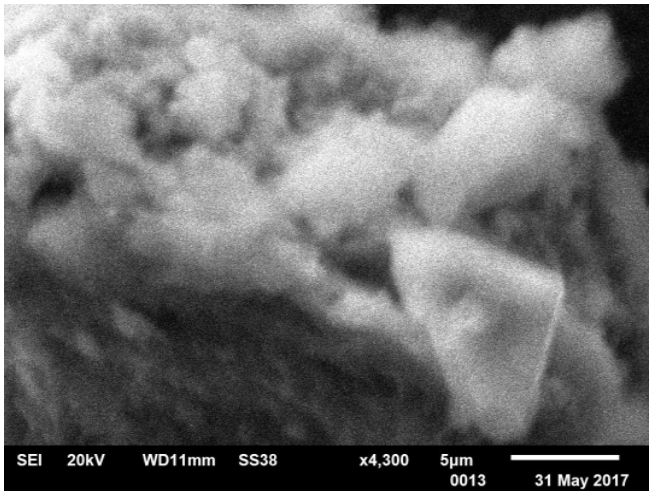
Abstract

The composites of biopolymers and clay minerals have great potential in the efficient removal of hazardous pollutants from wastewater. In this study, the adsorptive properties of carboxymethyl cellulose/organo-montmorillonite (CMC/OMMT) composite were investigated for the removal of acid dye AR42. The composite was characterized by the FT-IR and XRD analysis. The adsorption of AR42 acid dye in aqueous solution onto the CMC/OMMT composites was tested by varying the mass ratio of CMC to organo-montmorillonite , the pH value of the dye solution, the temperature and time, and the initial dye concentration (summary in the test reaction of elimination of dye). The organic modification of montmorillonie facilitated the intercalation of the motifs of CMC molecules into the interlayer space of organo-bentonite. There was the intermolecular and intramolecular linkage among CMC molecules and organic montmorillonite platelets.

The maximum dye sorption was found to be at a pH of 5.2 (91.14 %). The composite CMC/OMMT can be used as a potential adsorbent to remove AR42 dye from an aqueous solution.



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Biography

Our team is interested in the preparation of several biopolymers composite, and also studied their structure and its morphology by different techniques such as (FTIR, DRX, and SEM). For the purpose of the applied in the environmental field (water treatment against dyes) and in the antibacterial field. I am enrolled in 5th year PhD and I metise different method of characterization (such as FTIR and DRX and spectrophotomere, HPLC) and different software (excel, ppt, endnote).

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Catalytic oxidation of β-bromoalcohols derivatives of natural terpenes

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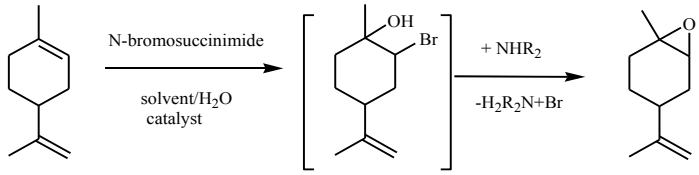
Abstract

Catalysis is one of the fundamental principles of green chemistry. The design and application of catalytic systems are simultaneously achieving the dual goals of environmental protection and economic benefit [1].

The main objectives of the present investigation are the development of new or improved, methods and catalysts for the oxidation of natural terpenes, which are extremely useful starting materials for several high-value chemicals and pharmaceuticals [2], with an ultimate aim of developing efficient synthetic routes to vic-hydroxybromides, epoxides and aminoalcohols.

In a preliminary step, the vic-hydroxybromide of limonene was prepared. The reaction was carried out under mild conditions in the presence of N-bromosuccinimide using different catalytic systems. The results show that terpene react regioselectively to form the vic- hydroxybromide in good yield.

Under optimized reaction conditions, the transformation of limonene to the corresponding epoxide via hydroxybromide was carried out in-situ testing different amines. With the efficient catalytic systems and conditions in hand [3], we extended the methodology to various natural terpenic olefins. Excellent yields and regioselectivities have been obtained.



Scheme 1: Synthesis of Limonene hydroxybromide and limonene oxide.

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The oxidation of methanol by a carbon paste electrode modified by para-phenylenediamine and nickel nanoparticles

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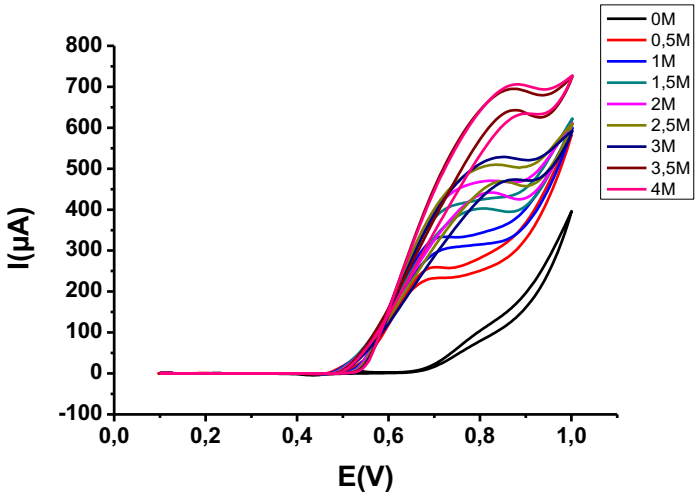
Abstract

Many researches have been conducted to improve the catalytic oxidation of methanol using chemically modified electrode [1,2]. Some of this works have reached a saturation limit of methanol up to 0.14 M using poly(1,8-diaminonaphtalene) Nickel nanoparticles as electro catalysts [3] . Other works have been devoted to developed a polyaniline film on the surface of a glassy carbon electrode, transition metals such as Nickel and Copper have been incorporated into the film by immersion of the electrode [4] .Lamy and his team studied the deposition of platinum micro particles on a polyaniline film for the oxidation of methanol by electrolysis at constant potential using acid solutions of hexachloroplatinate [5].

To the best of our knowledge, no studies have been carried out for the oxidation of methanol using a para-phenylenediamine modified carbon paste electrode with nickel nanoparticles.

The aim of this work is the elaborationof a novel cheap material with high electro catalytic activity toward methanol electro oxidation, for this theelectro polymerization of para-phenylenediamine on bare carbon paste electrode was carried out by applying a potential between -0.3V and 0.9V for 15 cycles at a scan rate of 50mV.s-1using cyclicvoltammetry. The electrodeposition of Nickel particles can then be carried out at a constant potentiel of -0.5 V for 45s on the polymer film. The nanocomposites thus obtained have been investigated formethanol oxidation, indeed they have been able to oxidize an important concentration of methanol, the saturation limit reached 3.5M.

It appears that the addition of the particles of Nickel increases the catalytic activity of the material with respect to the oxidation of methanol. Para-phenylenediamine and Ni particles are thus a promising non-presiouselectrocatalyst which might be utilized efficiently to enhance the performance of Direct Methanol Fuel Cells.



Current / potential curve of 0.1 M NaOH with different methanol concentration of 0.5 to 4 M on the CPE / PPD / Ni electrode at a scan rate of 50mVs^{-1}.

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New Application of plant extracts as corrosion inhibitors of reinforcement steel in carbonated concrete pore solution

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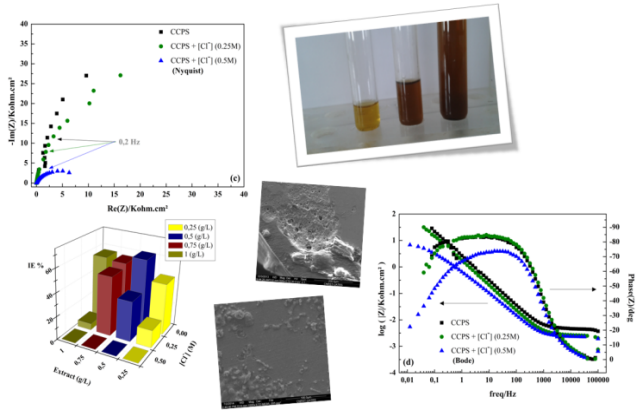
Abstract

Various methods of protection and repair currently exist. One of the methods of combating corrosion is the use of corrosion inhibitors, which decrease the corrosion rates to the desired level with minimal environmental impact. Harmful or toxic admixtures used in the construction industry have to be replaced because of strict environmental protection regulations.

Environmental concerns have led researchers to valorize the plant extracts containing various phytochemical compounds in industrial application to replace some inhibitors classified as toxic and unfriendly. Plant extracts have been widely used as green corrosion inhibitors because they are considered as nontoxic, biodegrable, rich source of organic molecules and cost-effective. In concrete, application of these natural products is still insufficient.

In this work, to provide more information, the behavior of reinforcement steel has been studied in simulated carbonated concrete pore solution in presence of methanolic extracts of *Chamaerops humilis* L, *Lawsonia inermis* L. and *Warionia saharae* leaves. The phytochemical screening was used to reveal the presence of some phyto-constituents in the plant extract and the electrochemical measurements were used to understand the behavior of the reinforcement steel in presence of the extracts molecules.



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Electromagnetically induced transparency and bound in continuum states in double Aharonov-Bohm coupled rings

T. Mrabti[1], Z. Labdouti[2], O. El Abouti[2], E.H. El Boudouti[2] and F. Fethi[2]

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Abstract

Electromagnetic induced transparency (EIT) is the phenomenon whereby a sharp transparent window associated with steep dispersion is induced into opaque atomic media [1,2]. In this communication, we investigate EIT resonances [1,2] and bound in continuum (BIC) states [3,4] in a mesoscopic structure made of double Aharonov-Bohm rings of lengths $2d_1$ and $2d_2$ threaded by a magnetic flux Φ_i (i=1, 2) and coupled by a wire of length d_0 (Fig. 1). These investigations are accomplished through an analysis of the amplitude of the transmission coefficient and density of states (DOS) obtained using the Green's function method [5,6]. In a recent publication [7], we have treated the possibility of existence of Fano resonances in a double ring. In this communication, we are interested by EIT resonances in such systems.

Figure 2 gives an example of the transmission spectrum versus the dimensionless wave vector $kd_0/2\pi$ for $d_1=1/3d_0+0.025$ and $d_2=1/3d_0-0.025$. The magnetic flux inside the ring is chosen such that: $\Phi_1=\Phi_2=0.2\Phi_0$, where $\Phi_0=hc/e$ is the quantum flux associated with a single charge of the electron *e*, h is the Planck constant and c the speed of light in vacuum. One can notice the existence of two transmission zeros indicated by solid circles on the abscissa of Fig.2 and a full transmission (transparence window) around $kd_0/2\pi = 1.5$. This is a characteristic of an EIT resonance.

In addition, we show that for specific values of the magnetic flux and for an appropriate geometry of the structure, the EIT resonances (Fig. 2) collapse giving rise to the so-called trapped states or BIC states. In addition, it is found that the width and the amplitude of the EIT resonances are very sensitive to the magnitude of the magnetic flux. Indeed, the width of the EIT resonance becomes gradually broader with increasing the magnetic flux. In absence of the magnetic flux, the width of the EIT resonance vanishes in the transmission coefficient as well as in the density of states giving rise to BIC states. These results may have important applications for electronic transport in mesoscopic systems.

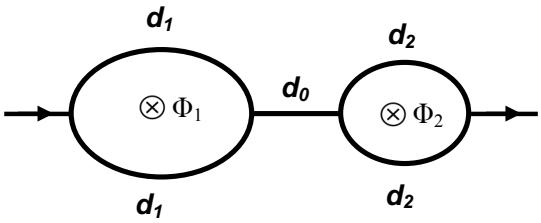

Figure 1: Schematic illustration of the Aharonov-Bohm structure made of two rings of lengths $2d_1$ and $2d_2$ coupled by a wire of length d_0. The whole structure is inserted between two semi-infinite leads.

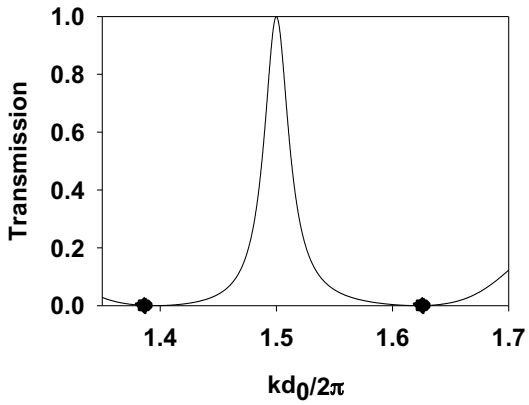

Figure 2: Transmission coefficient versus the dimensionless wave vector $kd_0/2\pi$.

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Electrochemical studie of adsorption and corrosion inhibition of Organic compound PID on mild steel in acidic solution

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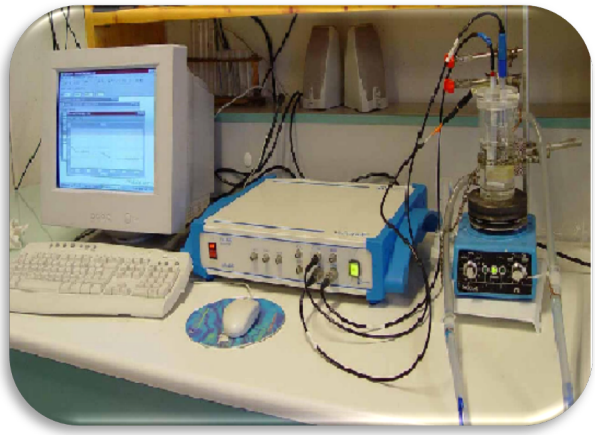
Abstract

The study of inhibition corrosion of metal surfaces (SM) against corrosion in acidic solutions by inhibitors is an important industrial subject and a very powerful research subject. In particular, acidic solutions are widely used in industry, the use of corrosion inhibitors is essential to limit the corrosion of metallic materials [1-3]. Organic compounds are good inhibitors of electrochemical corrosion of metals [4].

The compound inhibition capacity (PID) against corrosion of ordinary steel in 1M HCl solution was studied at various concentrations ranging from 10^{-6} to 10^{-3} M to 298K. This study was carried out by two methods namely the method of weight loss and electrochemical (polarization curves and electro-chemical impedance spectroscopy (EIS).

Experimental results reveal that PID is an effective inhibitor against corrosion. Their inhibition efficiency increases with the concentration of this inhibitor, and which has the mixed character. Thus, the inhibitor adsorption studied on the ordinary steel surface obeys the Langmuir adsorption isotherm.



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Numerical study of the effect of Ganghoffer Austenitic grain mesh geometry improved on TRIP results

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Abstract

The industrial field becomes more and more demanding, looking for optimal performances for the materials used, among others in the sectors: renewable energies, aeronautics, aerospace, naval, automobile, etc. In this respect, the choice of good materials is of particular importance. TRIP steels (TRansformation Induced Plasticity) are of particular interest to the extent that they are likely to have good characteristics of both ductility and thermomechanical resistance. This TRIP effect is present in austenitic steels. In this work, we present a numerical simulation of the plasticity of transformation (TRIP) in a metal alloy (steel Fe-Ni-C), with a mesh of a martensitic grain with twelve directions of shear of the martensite platelets. A two-dimensional micromechanical model is implemented in a finite element code (ZEBULON). The effects of platelet geometry, processing progress criteria such as: the max mechanical driving force (FMMmax), the average mechanical driving force (FMMmoy) and the mechanical shear force (FMC), as well as the direction of platelet shear on the parameters of martensitic transformation, were studied. It has been found that the proposed mechanical criterion (FMC) favors the influence of the slip phenomenon in the progress of this type of transformation (Magee mechanism). The results obtained clearly show that the multiplication of platelet shear directions and the platelet transformation order criterion have a great influence on the parameters of the transformation, that is to say, the kinetics, the direction of plastic flow and the value of TRIP.

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Biography

My work is directed for a better understanding and a mastery of the numerical simulation of TRIP steels, given their vast fields of application because of its mechanical performances. I obtained my PhD in 2016 from the University of Constantine, Algeria. I have published more than 8 Communications, an article about Scopus and another without index.

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A green and catalytic conversion of β-pinene oxide to perillyl alcohol

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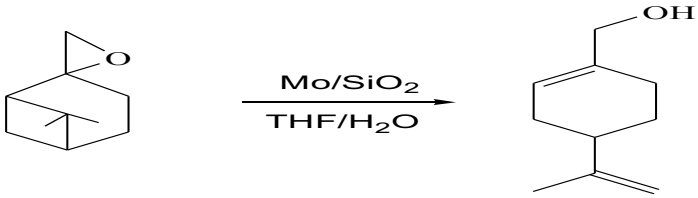
Abstract

Catalytic synthesis of fine chemicals from biomass is an important topic gaining recently a strong momentum. Several catalytic transformations of terpènes have been recently reviewed in [1]. These include isomèrization, oxidation, époxidation, hydration, estèrification and aldol condensation, with the products finding applications as cosmetics, pharmaceuticals, and flavors. One important group of compounds are monoterpènes, which are present in relatively large quantities in different tree species and they are separated as by-products form pulping. Pinus ponderosa, which is common in US, contains high Δ^3-carene amounts (36%) together with β -pinene (16%), α-pinene (10%) and 12% limonene in the monoterpene fraction [2]. In comparison Picea abies common in Europe contains 58% α-pinene, 24% β-pinene and only 2% Δ^3 - carne in the monoterpene fraction [3]. Epoxides of monoterpenes can be isomerized to corresponding aldehydes and alcohols, which have applications as fine chemicals. Isomerization of β-pinene oxide has been intensively studied during the recent years [4–5].The isomerization of β-pinene oxide can be performed either by homogeneous or heterogeneous catalysis. Since the heterogeneous catalyst Mo/SiO_2 active in the isomerization of β-pinene oxide into THF, it was also tested for the β-pinene oxide rearrangement. The catalyst showed very high activity albeit poor selectivity values perillyl alcohol (fig.1).



Biography

Fatima Ezzahra Eddaoudi, PhD student in Mohammed V University, Faculty of Sciences Rabat, Morocco. Her focus is based on the preparation of new molecules with attractive added value via reactions catalysed by transition metal complexes.

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Self-cleaning glass based on sol-gel coatings

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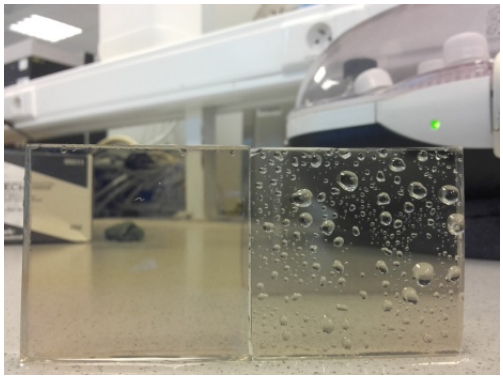
Energy Storage and Multifunctional Coatings Center, MAScIR Foundation , Rabat Design center, Rue Mohamed El Jazouli, Madinat Al Irfane.

Abstract

Self-cleaning glass is a special types of glass that needs minimal maintenance because its surface has been designed to keep itself free from dirt and grime. Nanotechnology is used for the fabrication of this special glass in which an ultra-thin coating is applied to achieve the self-cleaning property.

The goal of the study was to coat glass tiles with nanocomposites materials, to achieve a smooth thin coating with a functional performance, with both photocatalytic and superhydrophilic properties. A fine quality multicomponent nanocoatings was fabricated on the tiles, and a a big number of structural and morphological analysis of the nanocomposites from the synthesis and of the particles on the coating were performed.

We have also studied the aging of the coatings in outdoor exposure in real conditions, in order to follow the evolution of the surface energy and self-cleaning properties.



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2. S.Briche, M. Belaiche **DOI:** 10.1109/IRSEC.2016.7983986 **Publisher:** IEEE

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Oriented processes through functionalized polymer inclusion membranes for the facilitated extraction of Ca^{2+} and Fe^{3+} ions for the purification of oil solutions

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Abstract

Techniques based on membrane processes are adopted as a clean and environmentally friendly alternative to purification, separation, recovery or disposal of organic and inorganic substances from liquid or gaseous media with minimal energy consumption by significantly reducing the volume of waste.
For this work, we prepared two Polymer Inclusion Membranes (PIMs), based on the polymer support polyvinyl alcohol (**PVA**) and two extractive agents: Ethyl diamine tetraacetic acid (**EDTA**) and β-cyclodextrin (**β-CD**)
These membranes were characterized and have adopted to achieve the oriented processes for the facilitated extraction of **Ca^{2+}** and **Fe^{3+}** ions. The obtained results were used to determine the values of different parameters: macroscopic permeability **(*P*),** initial flux **(J_0)** and microscopic apparent diffusion coefficient **(*D**)** and association constant **(K_{ass})** relating to the substrate movement through the membrane. The influence of several factors, initial substrate concentration, acidity and temperature (**C_0**, **pH**, **T**...) was studied. The results indicate that the various parameters **(*P*, *J*, *D**** and **K_{ass}**) vary greatly with the temperature of the medium and the performance of the used membrane increases with temperature factor. Similarly, these studies made it possible to determine the values of activation parameters, (***E_a*, *$\Delta H^{\neq}$*** *and* ***$\Delta S^{\neq}$***), and to elucidate a mechanism by ***successive jumps of Ca^{2+} and Fe^{3+} ions on fixed sites*** of the immobilized extractive agent molecules in the membrane phase.

Figure : Schema of transport cell.

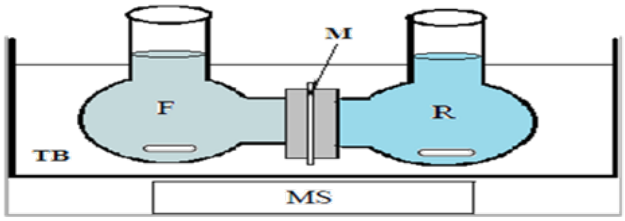

Table: Performance of the studied oriented processes for the facilitated extraction of Ca^{2+} and Fe^{3+} ions.

Temperature 35°C		β-CD	EDTA
Ca^{2+}	P *10E7 (cm2.s-1)	**63,09**	**37,94**
	J0*10E5 (mmol/s.cm2	**1,32**	**0,9**
	D*10E5 (cm2/s)	**2,29**	**4,51**
	Kass (l.mol-1)	**3,45**	**1,81**
Fe^{3+}	P *10E7 (cm2.s-1)	**114,82**	**87,11**
	J0 *106 (mmol/s.cm2	**2,41**	**2,05**
	D*10E5 (cm2/s)	**3,32**	**2,6**
	Kass (l.mol-1)	**4,64**	**8,95**

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Biography

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Cosmetic Bio-product based on cinnamon essential oil "Cinnamomum verum" for the treatment of mycoses: preparation, chemical analysis and antimicrobial activity

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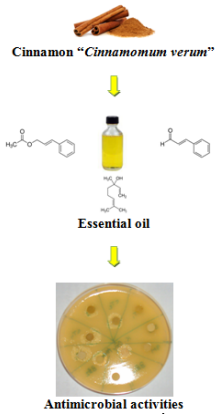
Abstract

The evolution of cosmetology is, in recent years, considerable, especially by the number of new substances that appear particularly natural substances. Hence, this paper presents the physicochemical analyzes and the biological activities of a cosmetic formulation based on the essential oil of *Cinnamomum verum* (bark of cinnamon). The first part of the work, and after the extraction of the essential oil of cinnamon by hydrodistillation, we analyzed all the constituents of this oil by GC-MS. The results of these analyzes showed that the main composition consists of three compounds: cinnamaldehyde (89.31%), cinnamyl acetate (2.44%), linalool (1.6%). the last part of this work aimed to investigate the antimicrobial activities in cinnamon essential oil by assessing each against mycotic microbes, then the antibacterial activity was done against: *Escherichia coli*, *Pseudomonas aeruginosa* and *Staphylococcus aureus*, and Antifungal activity was done against yeast *Candida albicans* and *Aspergillus niger*. The data of these microbial activities have shown remarkable activity, which implies the use of this oil in the treatment of mycoses.



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Biography

Professor Tarik AINANE, PhD. in Analytical chemistry, works focuses on natural product and environment.
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Sol-gel synthesis and characterization of Mn-doped Forsterite as potential ceramic pigments

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Abstract

Forsterite Mg_2SiO_4 is a member of the olivine crystal structure, known for its high thermal and chemical stabilities as well as its high capacity of hosting different metal cations. These properties make the forsterite a very interesting host matrix in ceramic pigments field. After pointing out the high potential of: Ni-, Co-, and Fe-doped forsterite as less expensive and less toxic ceramic pigments, our actual focus is to explore that of Mn-doped Forsterite.

On the other hand, the scientific literature indicates that the use of the traditional ceramic route to synthesize Mn based forsterite results in apparent limitations: low rate of Mn's solubility, formation of secondary phases, and high operating temperatures, etc. which, in turn, affect the required properties of the final ceramic pigment, i.e.: coloring and hiding powers, reaction with the molten glazes, etc. Currently, this research aims to present an alternative sol-gel method to overcome the mentioned problems related to the ceramic procedure.

The successful formation of $Mg_{2-x}Mn_xSiO_4$ ($x \geq 20\%_{mol}$) as single phase products at low temperature will be correlated with results of XRD, SEM, and FTIR analyses. With these obtained solid solutions, the compromise between performance and both price and environmental concerns is reached.

Keywords: Forsterite, Ceramic pigment, Sol-gel synthesis

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Biography

Authors have their expertise in the elaboration and improvement of silicates that will be used as ceramic pigments. Their focus is based on exploring new preparation methods and studying optical properties as well as application of the synthesized products in the ceramic field, following the rules of material sciences. They have published more than 10 articles.

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Synthesis of new monoarylidenes from limona-ketone

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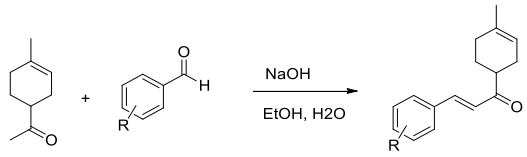
Abstract

Compounds possessing carbonyl groups conjugated with α,β-unsaturated carbon–carbon bonds are considered as vary important moieties in synthetic organic chemistry since they are the key substructure of many naturally occurring and biologically active molecules[1]. In addition, conjugated enone functionalities are appropriate precursors for other synthetic transformations. Synthesis of conjugated enones is usually carried out using aldol condensation reactions [2]

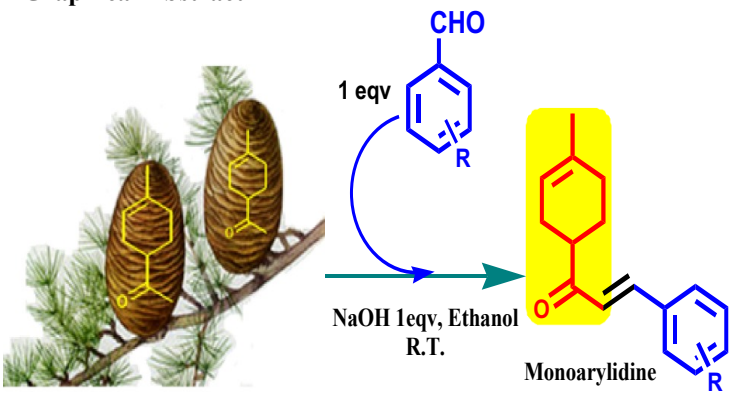
Developement of new organic transformations for the synthesis of monoarylidenes of cyclic ketones containing functionalized compound has been our interest and research objective. As part of our ongoing studies, herein we report an efficient and direct aldol-type condensation of limona-ketone with aromatic aldehydes as reagent and sodium hydroxide as a basis for preparing a natural derivative.



We executed a reaction of condensation for synthesis of new monoarylidenes by Limona ketone using various aromatic aldehydes, under Ethanol and catalyzed by NaOH. All the reactions were completed within 2–6 h at room temperature to give the desired products in modest to excellent yields (40–98%).

In summary, we have presented the synthesis of new monoarylidenes from limona ketone ,terpinic olefin. The prepared products can be used as precursor for the synthesis of drugs.

Graphical Abstract



R = H, Me, isopropyl, OMe, Cl, Br, F, NO_2, NMe_2

13 examples are reported **yield: 44 to 98%**

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Characterization of sisal fiber reinforced Polylactic Acid composites

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Abstract

Natural fibers offer several advantages, such as, low cost, low density, and eco-friendly nature. Due to their benefits natural fibers manufacturing have urged the attention of researchers towards the possibility of reinforcement of natural fiber. The use of conventional polymer obtained from non-renewable sources reinforced with natural fibers represents environment impact after their use**.** However, the scientists have been attracted to develop biodegradable polymers as composite matrices.

This work is carried out to evaluate the properties of natural fiber reinforced biodegradable polymer composites .the composites were prepared with different natural fibers contents (5%,10%,15%).The composites were elaborated by extrusion machine. The reinforcement of composites was sisal fiber and the matrix was Polylactic acid (PLA). The mechanical and thermal properties of sisal fiber were assessed. The tensile testing of sisal fiber reinforced PLA composites was evaluated by using tensile tester as per ISO 527. The flexural testing of sisal fiber reinforced PLA composites was analysed according to ISO 178 .The impact testing was carried out according to ISO 179 .The results of the sisal fibers and composites characterization were satisfactory ;The thermo-mechanical properties of sisal fibers reinforced PLA composites were significantly higher than those of the PLA polymer itself; there were an increase in the composites tensile ,flexural and impact strength with the increasing of sisal fiber contents

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Biography

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Inhibition Effect of the essential oil of *Thymbra capitata (L.) Cav* and its extracts on The Brass Corrosion in 3%NaCl solution

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Abstract

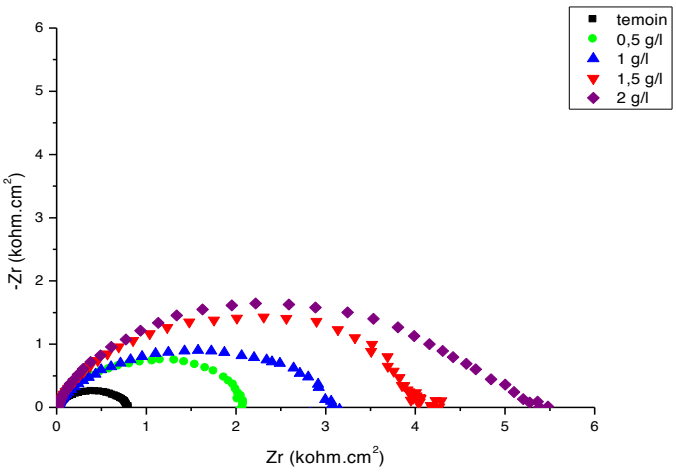
Copper and its alloys are widely used in industry owing to their excellent properties. However, this type of material is sensitive to marine corrosion. The use of organic and inorganic inhibitors is the most practical method of protection against corrosion. Recently, the use of chemical inhibitors for corrosion prevention tends to be limited because of their toxicity. Nowadays, natural products are used as anti-corrosion agents, and several researches have proved that essential oils are good green corrosion inhibitors for Brass.

The purpose of the present study is to determine the inhibition efficiency of the essential oil of Thymbra capitata (L.)cav and its extracts (aqueous extract and hydrolat) on the corrosion inhibition of brass in a 3% NaCl medium. Certain parametersm; (concentration, temperature) were studied in order to evaluate the inhibitory power of Thymbra capitata (L.)cav plant.

The study was carried out on the basis of various stationary and non-stationary electrochemical techniques (Mixed potential (OCP), Electrochemical Impedance Spectroscopy (EIS) and polarization curves).

X-ray diffraction (XRD) and Gas chromatography-mass spectrometry (GC-MS) methods were used to analyze the chemical composition of the aqueous extract and (essential oil and hydrolat) respectively. Theoretical study was performed to optimize the main components of the plant extract and oil by using gradient corrected DFT at B3LYP/6-31G level with Gaussian 09 program.

According to the results obtained the addition of the optimal (2g/l) concentration of essential oil of Thymbra capitata (L.)cav shows maximum inhibition efficiency as compared to that of the aqueous extract and hydrolat in the corrosive medium.



Nyquist diagrams obtained for brass in 3% NaCl medium at different concentrations of essential oil of Thymbra capitata (L.) *cav*

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Biography

Chraka Anas attained his Master degree in general chemistry in 2012.Degree in fundamental chemistry in 2014 from the University of Abdelmalek Essaadi, Tetouan, morocco. Since then, he is currently doing deep research on (Inhibitory effect of natural substance extracts on brass corrosion in 3%NaCl medium), also trying to expand and apply his knowledge in the area of plants and essential oils in the same university, making several communications titled (The inhibiting effect of Rosemary essential oil on the corrosion of Brass in a 3% NaCl medium, Fs TETOUAN.

Evaluation of the inhibiting power of the essential oil of Rosmarinus officinalis L on the corrosion of Brass in 3% NaCl medium, Ensa TANGER.

The inhibitory effect of the essential oil of *Thymus vulgaris* on the corrosion of Brass in 3%NaCl *Solution. Fst FES)*

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Study of oxygen reduction reaction on pre-reduced copper in 0,5 M NaCl

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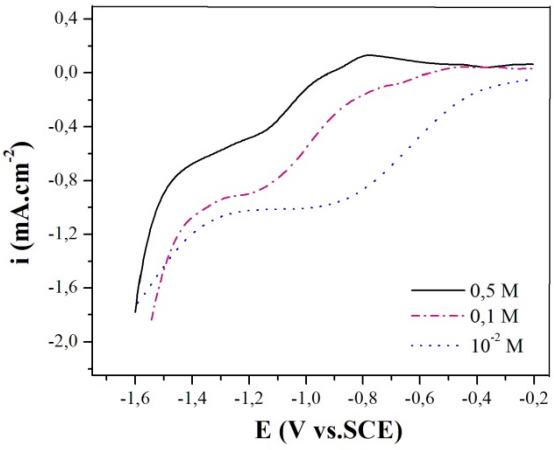
Abstract

Regarding to their excellent mechanical properties, associated to a corrosion resistance quite satisfactory, the passivable metals occupy a prominent place in several industries. However, these materials undergo corrosion in some media especially those containing chloride [1]. Consequently, to understand the phenomena taking place into their surface, some electrochemical investigations should be done. Our interest is to outline the significant role of oxygen reaction reduction (ORR) on copper. The majority of the previous studies concerned only anodic dissolution of the metal while the cathodic reaction, which is least studied, can provide relevant information [2,3,4].

For this purpose, the mechanism of the ORRin 0,5 M NaCl was studied using electrochemical methods. We have used the rotating disc electrode (RDE) to obtain cathodic polarization curves at different O_2 concentrations. Parameters, such as reaction order, kinetic current as well as the number of electrons transferred were determined [5]. Furthermore, electrochemical impedance spectroscopy measurement was used accordingly and The EIS data were analyzed.



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Biography

Nisrine BENZBIRIA is a PhD student currently attending Faculty of Sciences of El Jadida at ChouaibDoukkali University, with a joint supervision in Faculty of Sciences of Casablanca at Hassan II University. Her current research project takes part in the study of the kinetic parameters of oxygen reduction reaction on copper and aluminium, which are widely used in aeronautical industry. Prior to her doctoral studies, she received her engineering degree in materials from Cadi Ayyad University in 2012. Then, she worked as a head of slip casting Department in Casablanca.

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Effect of Sodium Chloride on the survival of *Legionella pneumophila*

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Abstract

The presence of *L. pneumophila* in water systems is a public health problem, *Legionella* is an important cause of both nosocomial and community-acquired cases of legionellosis, the bacterium is the causative agent for, and is most often associated with Legionnaires' disease. It has proved to be a recalcitrant pathogen which is capable of resisting or recolonizing water networks after repeated cycles of treatment. the aims of this study were to investigate the effect of Sodium Chloride and different temperatures (20 and 37°C) on the survival of *Legionella pneumophila* in planktonic and sessile state. It was found that at 20°C, *L. pneumophila* was able to survive in salt concentrations up to 2% NaCl. While at 37°C with sodium chloride concentrations over 2% reduce systematically the numbers of bacterial cells. Biofilms were growth for 20 days in the absence and presence of sodium chloride. The results show that bacterial strains were able to survive in sodium chloride solutions (2%-3%) and continue to growth. Moreover, it seems that this effect is less expressed with the age of the biofilm.

Keywords: *Legionella pneumophila*, biofilms, Sodium chloride, water.

Analysis of optomechanical coupling in triangular lattice phoxonic crystal cavities

Madiha Amrani[1], Abdellatif Gueddida[1,2],Adnane Noual[1], El Houssaine El Boudouti[1], Yan Pennec[2] and Bahram Djafari-Rouhani[2]

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Abstract

Phoxonic crystals are periodic structures that can exhibit simultaneously phononic and photonic band gaps. Therefore, when creating defects such as cavities inside such dual phononic/photonic crystals, it becomes possible to confine both photons and phonons in the same region. The high confinement of the two excitations would allow a significant enhancement of their interaction for the purpose of conceiving novel and highly-performant optomechanical devices and their applications.

The simultaneous band gaps for phonons and photons in different structures have attracted much attention in recent years. Many papers have investigated the simultaneous existence of photonic and phononic band gaps in (2-D) and (3-D) structures. Maldovan and Thomas [1,2] have shown theoretically that dual photonic and phononic band gaps can be easily obtained in 2D square and hexagonal lattice crystals made of silicon matrix drilled with air holes. Sadat-Saleh et al [3] demonstrated the possibility to obtain simultaneously phononic and photonic band gaps in complex arrays such as multiple cylinders per unit cell in a lithium niobate-based 2D structure. Shortly after, similar calculations were also performed for a crystal slab constituted by an array of Si pillars on a SiO2 plate [4].

Recently, optomecanical (OM) interaction has been investigated in different structures based on slabs using well constructed cavities. Gavartin et al [5] reported, theoretically and experimentally, the existence of a strong OM coupling inside a 2D optomechanical slab cavity. Furthermore, Fuhrman et al [6] were able to demonstrate experimentally the acoustic modulation of the resonant optical frequency of a confined mode inside a cavity. El-jallal et al [7] have also investigated the acousto-optic interaction in 2D infinite Si and GaAs phoxonic crystal drilled with holes. They have shown that GaAs phoXonic crystal presents a full acousto-optic interaction almost two times higher than in Si.

In this work, we have theoretically investigated the OM interaction in a cavity created in a phoxonic crystal slab constituted by an array of Si pillars on a SiO2 plate (Fig. 1) presenting band gaps for both photonic and phononic modes. We have shown that both elastic and electromagnetic waves can be confined simultaneously inside a cavity created by varying the height of the pillar. The optomechanical coupling has been calculated considering the two main mechanisms: the photoelastic (PE) and the moving interface (MI) effects. Two methods of calculation have been considered, the calculation of the coupling rate (based on a first order perturbation theory) and the modulation of the photonic mode frequency.

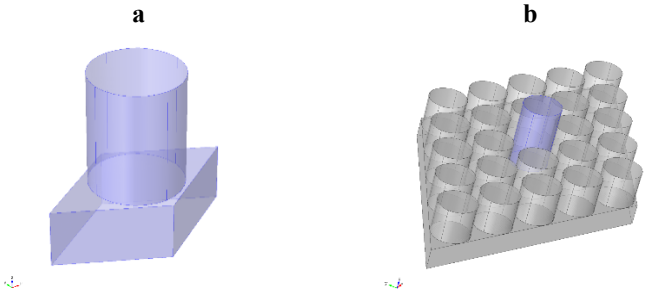

FIG 1. (a) Schematic view of a unit cell of the structure made out of cylindrical Si pillar on a SiO2 plate. (b) Sketch of the cavity created inside a triangular lattice phoxonic crystal.

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Biography

The Author has an expertise in modeling and simulating (numerically) phononic and photonic structures for the modulation of light by acoustic waves. She is a PhD student at the Faculty of science 0ujda (Morocco).

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The effect of leachate irrigation on soil properties

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Abstract

The reuse of treated leachate in irrigation or watering of green spaces, can be considered as an alternative solution to face water deficit. However, it represents a risk of environment contamination by the accumulation of polluting elements in the plants tissues and the change of soils and groundwater properties.

This article will focus on the study of the effects of irrigation by different types of leachate on the soil properties. The Physico-chemical parameters of the treated and non-treated leachate (TSS, conductivity...) influences the soil interactions, they generates a change at the level of those characteristics parameters.

The test has been conducted at the center of waste disposal and recovery of the municipality of Meknes, on the period May-October. We have ten irrigated parcels of the corn sorghum by four types of effluent: Drinking Water (witness parcel), gross leachate, leachate Treated by ultrafiltration and leachate Treated by reverse osmosis.

Subsequently we have measured the permeability, salinity and the pH of the soils of various parcels, the results obtained shoxs that the soils permeability decreases with the leachate pollution load, more leachate are loaded more the permeability decreases. As well as to salinity, which increases in parallel to the effluent conductivity.

The monitoring of these parameters has allowed to show the degradation of the soil quality according to the leachate composition.

Image: The differet effluents used during the irrigation test

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Biography

Author is an environment engineer. Her focus is based on the treatment of leachate and the waste management. Phd Student in faculty of sciences, University of IbnTofail, Kénitra.

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Study of the corrosion inhibition of heat treated titanium in a 3M HCl solution by electrochemical impedance spectroscopy

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Abstract

The effect of heat treatment on the corrosion resistance of titanium samples was realised in a 3M hydrochloric medium. Two samples were heat-treated at different temperatures (700°C and 900°C) and cooled using different methods to recrystallize the material, while the third was left untreated. The results obtained show that the heat treatment showed resistance to corrosion in the aggressive medium. The thermal corrosion inhibition of these samples was studied using the electrochemical impedance spectroscopy method and the corrosion inhibition rate was calculated through the Tafel slopes.

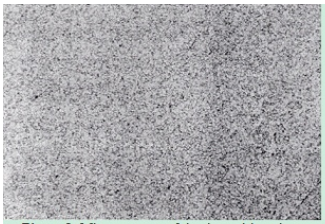

Figure 1: Microstructure of titanium without heat treatment. (X150)

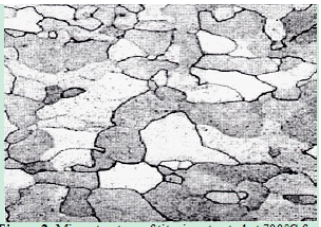

Figure 2: Microstructure of titanium treated at 700°C for 1h. (X150)

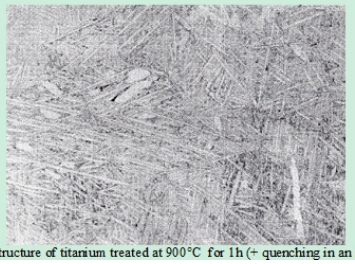

Figure 3: Microstructure of titanium treated at 900°C for 1h (+ quenching in an ice bath). (x 150)

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Biography

The objective was to change the structure of the studied material (grain texture and orientation of the reticular planes) by heat treatment and/or mechanical treatment and to have the effect of this modification on the corrosion behavior of the material in an aggressive environment. This study was the objective of my doctoral thesis in 2004 with the publication of about ten articles in national and international scientific journals.

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Elaboration of Molecularly imprinted polymersby Non-covalent approach

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Abstract

The technology of molecular imprinting has increased tremendously in the last years. It is based on the manufacture of synthetic polymers that selectively binds to a particular target molecule. The recognition capabilities of molecularly imprinted polymers (MIPs) are being successfully exploited in many application areas such as sensors, separations and extraction of chemical compounds, drug development, and drug delivery [1-5]. The work presented here focuses on the elaboration and the characterisation of MIPs by Non-covalent approach in presence of a target molecule.

The MIP materials were prepared by radical photopolymerisation of mixture conataining the n-butylacrylate (BuA) as monomer, 1, 6 hexanedioldiacrylate (HDDA) as crosslinking agent and 2-hydroxy-2- methyl-1-phenyl-propane-1-one as photoinitiator. The printed molecule chosen is 2-phenoxy-propionic acid (APP) analogous to (2,4-D) herbicide.

Non- imprinted materials (NIPs) and imprinted materials (MIPs) were characterized by infrared spectroscopy (FTIR), and differential scanning calorimetry (DSC). The Infra Red (IR) analysis confirmed the presence of non-covalent hydrogen-binding between the target molecule and the monomer in pre-polymerisation mixtur.

The extraction of the target by several washes was confirmed by UV spectroscopy. The recognition properties of the NIP and MIP materials obtained toward APP were evaluated by GC assays of the batch rebinding solutions. The obtained results showed a specificity of printed materials.

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Biography

Author has her expertise in Preparation and characterization of several kinds of polymers ; chemically crosslinked polymer networks (synthesis, characterization, swelling/deswelling studies); photochemistry of polymers (ultraviolet irradiation, polymerization/crosslinking processes,….) . She was warded her Master in 2016 from the University of Tlemcen (Algeria).

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New Benzyloxyethyl Cellulose (BEC) Crosslinked EDTA: Synthesis, Characterization and Application for Supramolecular Self-Assembling Nanoencapsulation of Pb (II)

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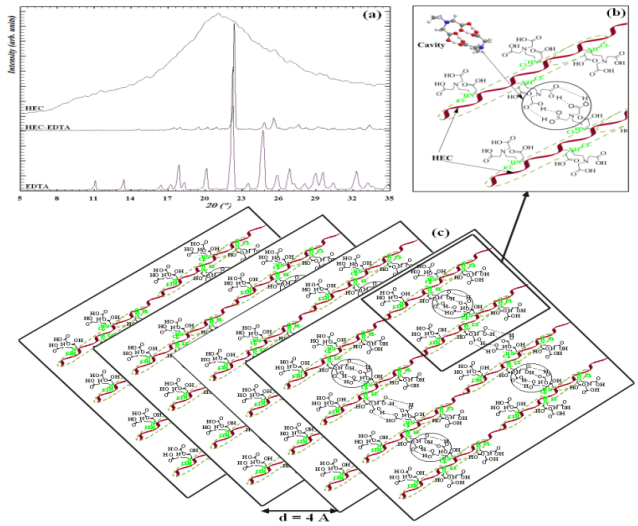
Abstract

In this work, new quaternized cellulose derivative based on Ethylenediaminetetraacetic acid (EDTA) and hydroxyethyl cellulose (HEC) is successfully prepared in homogeneous medium. The resulted product is characterized using spectroscopy techniques (FTIR,1H NMR and 13C NMR). At the supramolecular level, the x-ray patterns show that a high hydrogen bond density occurs by grafting EDTA on the HEC fibers. The new adsorbent (HEC-EDTA) shows a high adsorption capacity of heavy metals (Pb (II) and Cu (II)) from aqueous metals solutions. The adsorption of the both metal ions follows the pseudo-second-order kinetic model, while the adsorption isotherms are well described by the Langmuir model. The qm values are determined for Pb (II) and Cu(II), respectively. For each metal, the equilibrium adsorption time is found to be 30 min. Moreover, the HEC-EDTA adsorption capacity is strongly dependent on the pH value; and the adsorption is favorable for pH values between 4 and 6. Moreover, the results show a high affinity toward Cu (II) than Pb (II).



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Evaluation of the anti-corrosive behavior of the aqueous extract of *Daphne gnidium* L leaves on mild steel in hydrochloric acid

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Abstract

Mild steel is the most widely used in industrial applications due to its excellent mechanical properties and low cost. Acids are used in industry during, chemical cleaning, petrochemical processes and other electrochemical systems. The dissymmetry potentials between iron and hydrogen couples are the principal cause of this attack. The use of inhibitors is one of the most practical methods for protection against corrosion especially in acid solutions to prevent metal dissolution and acid application. The aim of this work is to obtain deeper insight into the mechanism of the protective action of corrosion inhibition of mild steel in 1 M HCl solution by plant extracts of *Daphne gnidium* L(DG) as green corrosion inhibitor. Tafel polarization, electrochemical impedance spectroscopy (EIS) and gravimetric measurement were the main methods used to investigate the inhibitor effect. The inhibitor DG showed 90% inhibition efficiency at optimum concentration 0.2g/l. The obtained results revealed that inhibition occurs through adsorption of the DG on metal surface. Potentiodynamic polarization studies suggest that DG acted as mixed type inhibitor. Electrochemical impedance spectroscopy techniques were also used to investigate the mechanism of corrosion inhibition.

Keywords: Corrosion, Inhibitor, gravimetric, EIS, potentiodynamic polarization.

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Biography

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Synthesis of Keggin-type Ruthenium substituted tungstophosphates encapsulated into mesoporous silica pillared in clay interlayer galleries and their catalytic performance in cyclohexene oxidation

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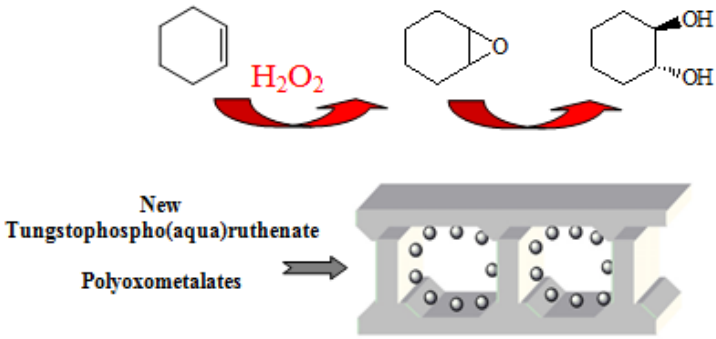
Abstract

Keggin-type ruthenium substituted polyoxotungstates was incorporated into the mesoporous silica pillared clays (PRuW-SPC) by a hydrothermal sol–gel method. The resulting materials retain the layered structure of the clay precursor and possess a mesoporous structure. X-ray diffraction, nitrogen adsorption–desorption, Fourier transform infrared spectra, X-ray fluorescence analyses and diffuse reflectance UV–vis spectrawere used to characterize the structures and the synthesizing mechanism of PRuW-SPCs.The materials are readily separable mesoporous materials with high specific surface areas. The results indicate that the surfactants play a decisive role in the introduction of PRuW molecule and the pore formation. Moreover, the surface area and pore size of the materials can be controlled by the molecular length and functional groups of the surfactants. The formation mechanism of the materials was also proposed. The catalytic performance of the materials was tested using cyclohexene oxidation with hydrogen peroxide as a probe reaction. The results indicated that PRuW-SPC possess a excellent catalytic performance The excellent catalytic performance for oxidation opens up new opportunities for applications of the synthesized materials in catalysis.



Biography

Author has her expertise in preparation and characterization of nano and mesoporous materials based clays and polyoxometalates. Her focus is based on the use of materials to have different applications including: Catalytic oxidation, Acid catalysis, Atmospheric pollution treatment, VOCs catalytic oxidation, Selective catalytic reduction of NO with propylene((HCSCR), Production of hydrogen by steam reforming of ethanol, Water pollution treatment, Photocatalytic oxidation under ultraviolet and simulated solar light irradiation, Heterogeneous Advanced Photo-Fenton Oxidation and Adsorption of heavy metals. She was warded her PhD in 2015 from the University of Tlemcen, Algeria. She published 7 papers. Her H-index is X on Thomson Reuters and Scopus.

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Large magnetic entropy change in $Pr_{2/3}Sr_{1/3}MnO_3$-CuO composite at room temperature

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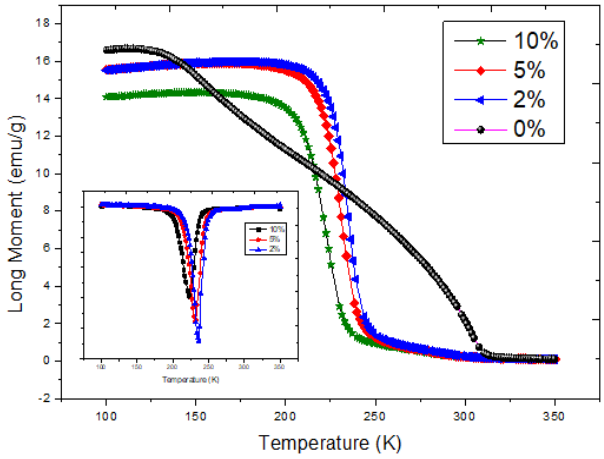
Abstract

In this paper, we report the impact of copper oxide (CuO) on the structural, magnetic and magnetocaloric properties of Pr2/3Sr1/3MnO3(PSMO) material. Copper oxide was added on the perovskite manganite with three concentrations 2%, 5% and 10%. The samples were synthesized by conventional solid-state reaction. The X-ray diffraction (XRD) technique was used to check the formation of the phase in samples composites. The magnetic properties were measured by Magnetic Properties Measurement System (MPMS). From the magnetization as function of temperature, we discussed the influence of the CuO on the nature of the transition order of the perovskite. The isothermal entropy change is calculated from the isothermal curve of the magnetization as function of the magnetic field. It is found to be around 5 J/kg K for the sample 10% of CuO composite under 5 Tesla.



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Modeling of operation of a proton exchange membrane fuel cell(PEMFC) and the environmental impact of using PEMFC

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Abstract

Following the huge industrial development and the requirements and climatic constraints to preserve the environment requires the research of alternatives to replace the fossil energy sources that dominate the world energy production, by cleaner energies is that best meet the need energy and climate change. In this context appeared the proton exchange membrane fuel cell as a better solution, and it has had considerable attention thanks to these many advantages. In this work, an appropriate study highlighting the state of art and the stage of development of this technology, an experimental electrochemical and thermodynamic study on the various parameters that affect performance. The results of our work concern the dynamic state characterization and the real performances show that the performance of the proton exchange membrane fuel cells PEMFCs depends on the several parameters which makes the optimization of the interactions between these different strongly torque phenomena is important for the good functioning.

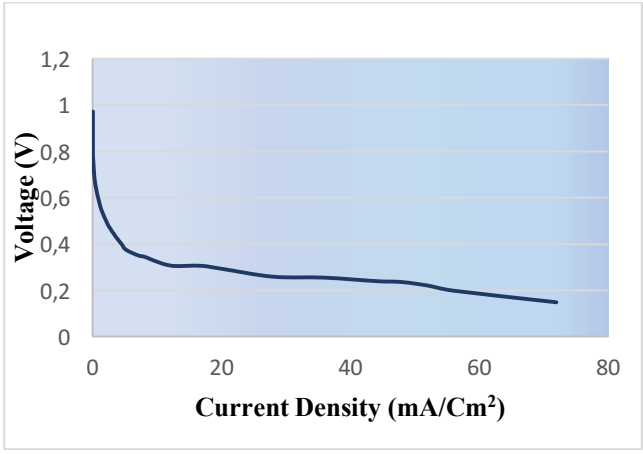

***Figure I**: Shows the variation of the voltage as a function of current density*

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Biography

I am Zineb Hbilate, aenergetic engineer from the University Hassan II. Actually, I am a PhD student inElectrochemistry Team, Laboratory of Physical Chemistry of Materials, Faculty of Sciences Ben M'sik,University of Hassan II Casablanca.

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Comparison of scattering spectra and density of states in a layer deposited on a substrate

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Abstract

There is a great interest in the study of acoustic phonons using light scattering. Lamb, Sezawa and Rayleigh waves have been observed in various systems made of bilayers materials deposited on SiO_2/Si [1] or amorphous Si/crystalline Si substrates [2]. Bilayers materials deposited on Si/SiO_2/Si substrates [3, 4], and on PMMA-Si3N_4membranes [5] have also been shown to support these types of waves.

In this work, we give a comparison between Brillouin light scattering spectra and density of states(DOS) to determine the dispersion relations in a structure made of PMMA layer on Si or SiO2 substrates. We first proposed a simple model to deduce the eigen-modes of the system from an exact calculation of DOS. The modes of the layer appear as well defined peaks in DOS. This model is valid due to the high mismatch between elastic and optical impedances of the substrate and the layer.The eigen modes of the systemaround a given frequency are determined by the choice of the incident laser andby means of the calculation of the intensity of the scattered light. A very good agreement betweenexperiment and theory was found. We also simplifiedconsiderably the expression of the scattered intensity to show that it is written in the form of a cardinal sinus for stokes and anti-stokes spectra.

Figure 1 (a) give numerical results of Raman intensity obtained with the simple model using the calculated expression of the intensity. The thicknesses of the PMMA layers are indicated on figure 1(a). Figure 1 (b) illustrates the DOS (top) and the Raman spectrum (bottom) of a layer with a thickness d_1 = 490 nm. One can notice that Raman spectrum gives only the modes of the deposited layer falling at the vicinity of 15 GHz and far from this frequency, the intensity of the spectrum falls down to zero.

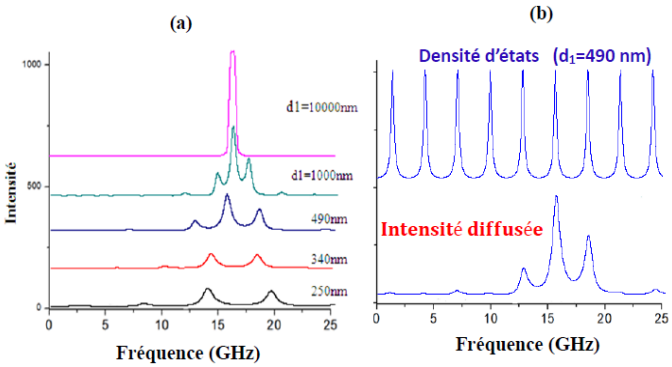

Figure 1 (a): Numerical results of Raman intensity obtained with the simple model using the calculated expression of the intensity. (b) Density of state (top) and the Raman spectrum (bottom) of a layer with a thickness d_1 = 490 nm.

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Chemical Durability and Structural Study of Bismuth Niobium Phosphate glasses

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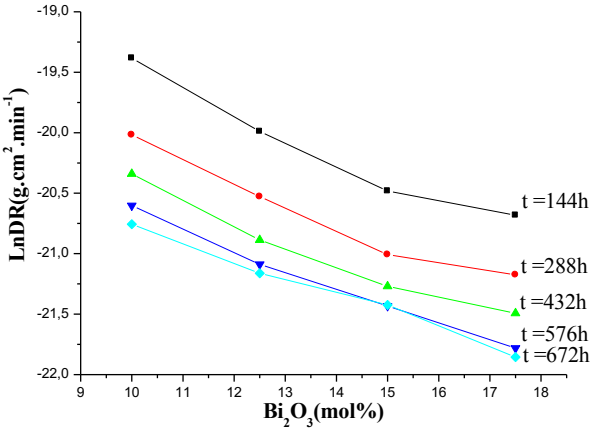
Abstract

Phosphate glasses have specific properties such as low glass transition and softening temperatures, a high thermal expansion coefficient and ultraviolet transparency [1-3]. However, the poor chemical durability of phosphate glasses has limited their practical application in real systems [4]. In this work, we investigated the chemical durability of glasses in the ternary system Bi_2O_3-Nb_2O_5-P_2O_5 [5], with two compositional lines, xBi_2O_3-$5Nb_2O_5$-(95-x) P_2O_5, with x = 10 –17,5 mol% Bi_2O_3, and $10Bi_2O_3$-xNb_2O_5-(90-x) P_2O_5, with x = 2,5 – 15 mol% Nb_2O_5. The durability of these glasses was studied in two solutions with different initial pH values. The changes in the pH of the solution as a function of the immersion time of the samples were used to study the dissolution mechanism. The chemical durability of the glasses is then correlated to the structure of the glasses wish was studied using Raman and FT-IR spectroscopy. Indeed, the relation between the structural and compositional change has been studied by the measurement of the density and glass transition temperature Tg. The obtained results show that the glass transition temperature and chemical properties (water-resistant qualities) increased with increasing compositions of Bi_2O_3 or Nb_2O_5 phase in the glasses, due to the increase in the number of bridging oxygens. The structure chains is broken into pyrophosphate groups $(P2O7)^{4-}$ and the P-O-P bonds are depolymerized by the incorporation of distorded Bi(6) (or Nb(6)) units through P-O-Bi bonds (P-O-Nb). These results agree with a closer structure and act in a manner that Bi_2O_3 or Nb_2O_5 enter the glassy matrix as a network former character.



Composition dependence of dissolution rates DR for $x$$Bi_2O_3$-$5Nb_2O_5$-(95-$x$)$P_2O_5$ (10≤x≤17,5 mol %) glasses after immersion in distilled water at 25°C at different point time.

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Biography

Laourayed Mohamed is a Moroccan national born in 1968 in Karia Ba Mohamed- Taounate, obtained a bachelor degree in 1990 at the Faculty of Sciences of Fes, and a DES in1997 at the Faculty of Sciences of Kenitra. He starts preparing a post-graduate doctorate, specializing in materials science in 2015s function. He participated in seminars, publishing articles. His research interests include the study of Novel phosphate glasses with different amounts of Bi2O3 and Nb2O5 for biomedical applications dissolution tests and proof of concept of fibre drawing.

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3Thermodynamic characterization of metal dissolution and inhibitor adsorption processes in mild steel / 3,5-bis(3,4-dimethoxyphenyl)-4-amino-1,2,4-triazole / hydrochloric acid system

I. Nadi[1], M. Tourabi[1], K. Nohair[1], A. Nyassi[1], B. Hammouti[2], C. Jama[3], F. Bentiss[1,2]

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[2] Laboratory of Bioorganic Chemistry, Faculty of Sciences, Chouaib Doukkali University, B.P. 20, M-24000 El Jadida, Morocco
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Abstract

New 3,5-disubstituted-4-amino-1,2,4-triazole derivative, namely 3,5-bis(3,4-dimethoxyphenyl)-4-amino-1,2,4-triazole (3,4- MAT) was synthesised and its inhibitive action against the corrosion of mild steel in 1 M HCl solution was investigated at 308 K. The detailed study of 3,4-MAT was been performed using gravimetric measurements and polarisation curves method.

Results show that 3,4-MAT is a good inhibitor and its inhibition efficiency reaches 98 % at·10−3 M. Tafel polarisation study revealed that 3,4-MAT acts as a mixed type inhibitor. The inhibitor adsorption process in mild steel/3,4-MAT /hydrochloric acid system was studied at different temperatures (308-323 K) by means of weight loss measurements. The adsorption of 3,4-MAT on steel surface obeyed Langmuir's adsorption isotherm. The kinetic and thermodynamic parameters for mild steel corrosion and inhibitor adsorption, respectively, were determined and discussed.

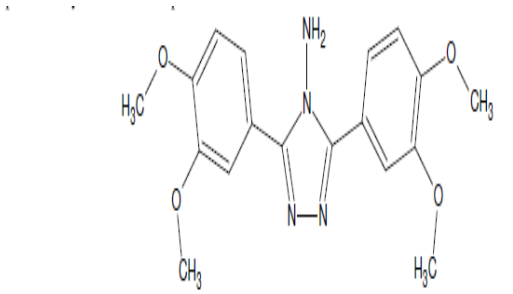

Figure 1: Chemical structure of 3,5-bis(3,4-dimethoxyphenyl)-4-amino-1,2,4-triazole (3,4-MAT).

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Biography

Imane NADI, PhD student in Faculty of Science Chouaib doukkali - El Jadida. she works on corrosion inhibition of carbon steel in acidic medium by organic compounds.

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Evaluation of alkaloids extract of Retama monosperma (L.) Boiss. stems as a green corrosion inhibitor for carbon steel in pickling acidic medium by means of gravimetric, AC impedance and surface studies

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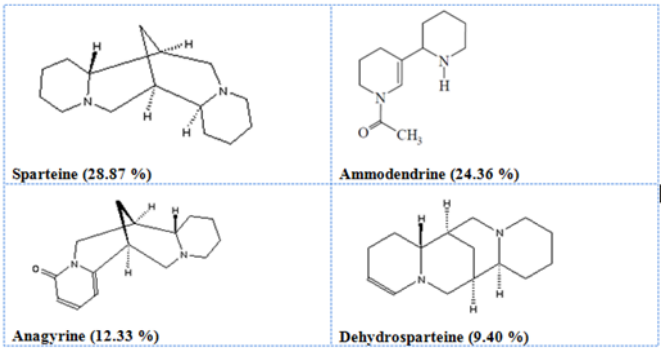
Abstract

The present work is devoted to the study of alkaloids extract from *Retama monosperma* stems (AERST) as green corrosion inhibitor to afford the protection of carbon steel in 1 M HCl medium at 30°C. Weight loss and AC impedance techniques were coupled with Scanning Electron Microscopy (AERST) and X-Ray Photoelectron Spectroscopy (XPS) analyses to characterize the inhibitive properties of AERST and to determine the chemical composition of the inhibitive film formed on the steel surface. AERST inhibited the corrosion of carbon steel in 1 M HCl, and its inhibition efficiency increased with the inhibitor concentration. However, a maximum inhibition efficiency of 83% was reached with 400 mg/L of AERST at 30°C. Adsorption of AERST on the steel surface in 1 M HCl solution followed Langmuir's isotherm. The XPS studies showed that the inhibitive layer is composed of an iron oxide/hydroxide mixture where AERST molecules are incorporated.



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Biography

Mustapha Tourabi, PhD student in Faculty of Science Chouaib doukkali - El Jadida. he works on the inhibition of corrosion of steel in acidic medium by organic compounds. he has published 11 articles.. His H-index is 4 on Scopus.

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Cationic distribution in the new Nd_2CaSnO_6 perovskite type-phase

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Abstract

Double perovskite oxides ($A_2BB'O_6$) continue to attract research interest, because of their unique electrical and magnetic properties that include metallic/half-metallic ferri-/ferromagnetism and magnetoresistance effects [1-3]. Despite the large number of perovskite oxides prepared over the years, the problem of the ordering of cations in the B-sublattice is only partly understood. Note that ordering of the (B and B') cations at the B-site of the perovskite structure plays a crucial role in determining their properties [4]. Although, it has been established that the size and charge difference between the B and B' cations facilitate ordering at the B-site [5], other factors, such as, specific bonding interactions (e. g. Jahn–Teller distortions and polarization properties) and also the synthesis condition and formation temperature may affect the degree of order. The arrangement of B and B' cations in $A_2BB'O_6$ double perovskites may be rock salt- or layered-type. While in rock salt-type ordering the B and B' cations order alternately in all three crystallographic directions, in a layered ordering, the layers of B and B' cations alternate along one of the crystallographic direction. Rock salt-type ordering is very common among double perovskites and gives rise to diverse materials properties. In a continuation of our search concerning perovskite-like structure [6-8], the new Nd_2CaSnO_6 perovskite was prepared by solid state reaction at 1200°C in air atmosphere. In a first time, structural characterization of Nd_2CaSnO_6 was carried out by using the Rietveld refinement, from X-ray powder diffraction (XRD) data, in the space group Pbnm with a disordered Ca/Sn arrangement within the perovskite B-sites. However, the profile description was inadequate since all the observed reflections could not be indexed (e.g. (021) and (103) reflections). As shown by the fit between the experimental and calculated XRD patterns (Fig. 1), the Rietveld refinement in $P2_1/n$ space group gave a satisfactory reliability factors (R_{WP} = 8.94%, R_B = 3.8%). The diffraction pattern is interpreted to exhibit splitting of the hkl and h0l lines indicative of a monoclinic ($P2_1/n$ space group) derivative of the $GdFeO_3$-type structure with lattice parameters : a = 5.658(1) Å, b = 5.925(1) Å, c = 8.188(2)Å and β = 90.11(2)°. The monoclinic structural distortion involves partial 1:1 ordering between Sn^{4+} (in 2c site) and a random mixture ($_{0.45}Ca^{2+}$;$_{0.05}Nd^{3+}$) (in 2d site) all at the B-perovskite sites.

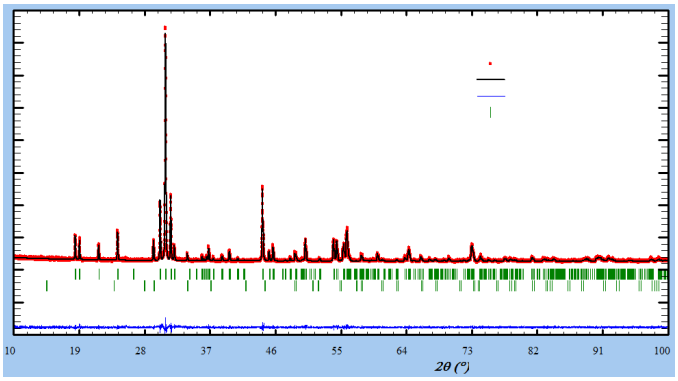

Fig. 1: Experimental (•••) calculated (—), and difference profile (—) of the XRD pattern of Nd_2CaSnO_6. Main diffraction lines of the secondary phase $Nd_2Sn_2O_7$ are indicated by red star (*)

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Biography

Author has her expertise in synthesis and structural refinement by Rietveld analysis using X ray or neutron powder diffraction. Her focus is based on the use of synthetic phosphate and oxide to have application as electrode in Lithium Batteries. She was awarded her PhD in 1987 from the University of Mohamed V Rabat, Morocco. She published more than 32 papers. Her H-index is 11 on Scopus.

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Analytical nanometrological approach for screening and confirmation of titanium dioxide nano/micro-particles in sugary samples based on Raman spectroscopy-capillary electrophoresis

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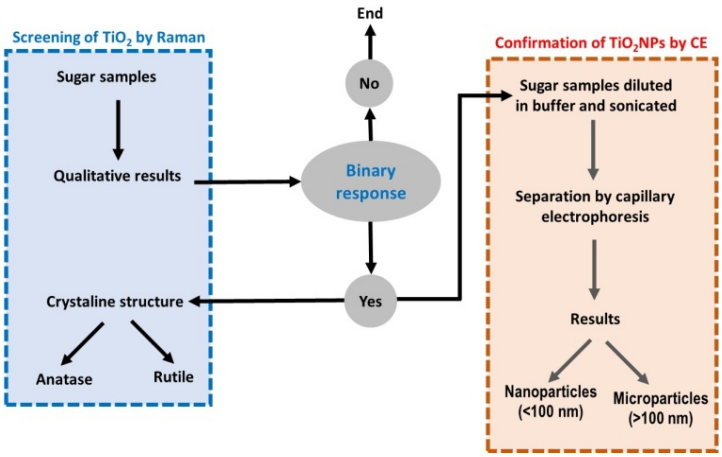
Abstract

Analytical nanometrology is a present challenge in today analytical science, particularly from a practical point of view and when it is addressed to routine/control laboratories. In this way, a screening-confirmation scheme is described for the characterization and distinction between titanium dioxide nano/micro-particles in sugary food samples. It is known that TiO_2 is a common additive used in many food, personal care and other costumer products, which after use can enter the sewage system and, subsequently, the environment. The first step of this study involves the confirmation of the presence of TiO_2 in the sample using a portable Raman spectrometer without any treatment of the samples. The crystalline structure of TiO_2 in the positive samples can be also obtained (anatase or rutile) in this step. Then, the second step, only for positive samples, involves the use of Capillary Electrophoresis (CE), which allows to distinguish between TiO_2-nanoparticles (<100 nm) from TiO_2-microparticles (>100 nm). Additionally, nanoparticles (TiO_2 anatase 5 nm and TiO_2 rutile 60 nm) and microparticles (TiO_2 rutile 0.1-0.2 µm) can be electrophoretically separated. The general procedure is simple, fast and low cost, providing a valuable analytical tool in the field of food safety and control.



Acknowledgments

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Biography

Author is a PhD student at Department of Analytical Chemistry and Food Technology, working at the Regional Institute for Applied Science Research (IRICA) at University of Castilla-La Mancha (UCLM), Spain, since 2014. She received her Bachelor´s Degree in Chemical Science in 2013 and Master´s Degree in 2014 from UCLM. She obtained an official research grant from JCCM of Spain for the PhD Thesis in 2014. In addition, her Thesis work is focused on the development and validation of new analytical processes incorporating nanomaterials for the control of residues in food.

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Investigation of the effects of Formulation, process parameters, Dispersions, and Rheology, using combined Modelling and experimental simulations

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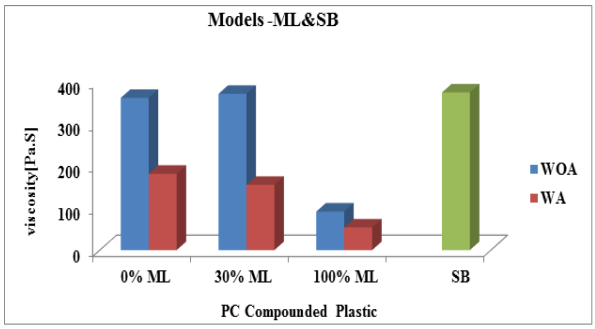
Abstract

The objective of this research is to study the rheological characteristics and dispersions of PC composition blends, at variant temperatures for two different extruders, and simulate viscosity models.

The research aims to identify the underlying science by conducting a systematic study of two stages.First, The polycarbonate grade was chosen from historical data mining was extracted in our project as was showing a high number of adjustment; The materialwas melt-blended using a (Coperion) Co-rotating twin screw extruder(SB).The two polycarbonate resins (PC1/PC2) were PC1 content (30wt%-pph) of MFI (25gm/10mins) and PC2 content (70 wt.%-pph) of MFI (6.5gm/10mins). The grades also included four different color pigments and three additives.

The second stage, the same material was included the same composition were blended in a Thermo Haake Mini Lab II twin-screw micro compounder (ML).The PC blend steps were (30%/70%), (50%/50%), further tests were carried on without pigments and additive WOP, with pigment WP, with pigment but no additives WPNA batches.

Further to the previous study, the effect of varying temperatures onWOP and (WP), the rheological behavior of the compositions on (WP), (WOP) and (WPNA) for PCs blends at 30/70% and 50/50% have been characterized through experimental measurements. The viscosity measurements and the dispersion of the PCs blends at certain processing of Coperion twin screw (SB) are higher than Minilab twin screw (ML), and the various interactions indicated a significant effects on color shifts. This will help in understanding some more factors that have bearings on color variations for different PC blends.By understanding the relationship between viscosities, temperature, and PC blends it becomes possible to simulate models with exactly defined properties and characterization at different typeof twin screw extruders.Finally, the most influential variation factors are the minute formulation (Wt. %) of polycarbonates, additives` and minute variation of processing extruders. The color variations for the (SB)-PC grade at the temperature of 280°C has indicateda significant effect on dispersion and minimizing the colorshifts.



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5. Saeed, U., Ahmad, S., Alsadi, J., Rizvi,G. and Ross, D. , 2013, Annual International Conference, PPS-29, Nuremberg, Germany, pp. 1-4.

Biography

I am a PhD-Assistance Professor on the Faculty of Mechanical Engineering and Applied Science, graduated from the University of Ontario Institute of Technology-Oshawa, Ontario .Canada. Before that, I received a Master's degree in Mechanical Engineering from Concordia University-Montreal, Quebec, Canada. I am currently a Faculty of Mechanical Engineering Technology at the Higher Colleges of Technology, Curriculum Development Committee Chair (CDCC) and Track Coordinator. My research area in polymer-SABIC-Canada (2008-2015). My research investigates of scientific reasons causing color mismatch in plastic compounds and to study the relationship among materials and processing parameters during compounding of plastics. Rheology and plastics processing, polymer blends and material characterizations. I have also worked for over twenty-five years, in the areas of Research, Teaching, Mechanical, Marine Engineering and Plastic Engineering. I have published approximately 30 articles in international journals and conference proceedings, and I am in the process of writing a few more research articles.

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New crystal design of a series of complexes and coordination polymers based on pyrazole-carboxylic acid ligands

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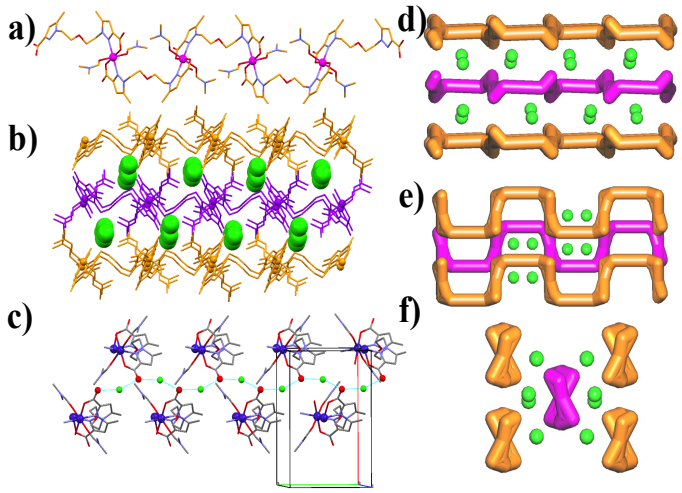
Abstract

The synthesis and characterization of novel coordination polymers (CPs) have called great attention because of their variety of architectures and topologies, as well as large potential applications in various domains such as molecular magnetism, photoluminescence, gas storage, catalysis, to name a few of them. Supramolecular chemistry tools, more precisely crystal engineering are used to create such structurally intriguing and functionally diverse coordination polymeric materials. We have been investigating the understanding of the supramolecular architectures and various structure-related properties of pyrazole derived CPs, in particular complexes combining pyrazole and carboxylic functionalities in a single building block.2 Three new coordination complexes namely [Cu(L1)H2O]·2H2O (1), [Cu2(L4)2(DMF)2(H2O)2](NO3)2 (4) and [{Cd2(L4)2Cl2(DMF)2}] (5), and two coordination polymers namely [Co(μ-L2)(DMF)2]·2H2O (2) and [Co(μ-L3)(DMF)2·H2O (3) have been synthesized from a series of pyrazole-carboxylate ligands namely 1,1'-(ethane-1,2-diyl)bis(5-methyl-1H-pyrazole-3-carboxylicacid) (H2L1), 1,1'-(oxybis(ethane-2,1-diyl))bis(5-methyl-1H-pyrazole-3-carboxylic acid) (H2L2), 1,1'-(butane-1,4-diyl)bis(5-methyl-1H-pyrazole-3-carboxylic acid) (H2L3), and 2-(1', 5, 5'-trimethyl-1H, 1'H-[3, 3'-bipyrazol]-1-yl) acetic acid (H2L4), and Cu(II)/Cd(II)/Co(II) ions. Single crystal structures of these compounds are discussed in the context of the effect of conformation of the ligands and supramolecular interactions observed within these edifices. Temperature dependent magnetic data of 4 could be fitted best using two non-interacting Cu(II) ions (S = 1/2) ions per molecule with giso = 2.28 and a temperature independent paramagnetism TIP = 1.75 x 10-5 cm^3mol^{-1}.



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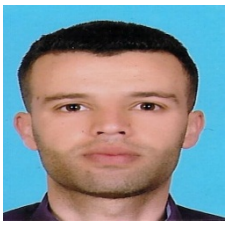
Biography



Mohamed El-massaoudi is a PhD student in the laboratory of Applied and Environmental Chemistry, Mohamed the first University Oujda-Morocco. His work is based on the synthesis and characterization of new hybrid materials used in a wide range of areas for their variety of architectures and topologies such as magnetism, catalysis, biological activities and the removal of heavy metals from water. He has published about 11 papers with a total citation of >40 and an H-index of 3 on Scopus.

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Enhancement of electrocoagulation-flotation process for urban wastewater treatment using Al and Fe electrode: techno-economic study

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Abstract

The performance of batch electrocoagulation-flotation (ECF) process using aluminum (Al) and iron (Fe) electrodes with monopolar configuration for the treatment of real urban wastewater was investigated. The effect of several operational parameters (initial pH, current density, electrodes material, initial NaCl concentration and operating time) on the removal efficiencies of chemical oxygen demand (COD) from urban wastewater was studied. Under optimal conditions (pH 7, current density of 20 $mA.cm^{-2}$, NaCl concentration of 2 $g.L^{-1}$ and 6 minutes of electrolysis time), the maximum removal efficiencies of COD using Al and Fe electrodes were found to be respectively, 85% and 83%. The operating costs were found to be 0.80 $/Kg COD for Al electrode, while it was noted 0.82 $/Kg COD for Fe electrode.

Keywords: Urban wastewater; Electrocoagulation-flotation (ECF); operating cost; Energy consumption

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Study of the effect of the inhibitor (LEUCINE) on the corrosion of the soft steel in the middle HCl (1 M): application of the Plans of Experiences

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Abstract

The present study attempted to investigate the best conditions for the use of a mixture of LEUCINE and iodide ions as corrosion inhibitor of mild steel in 1 M HCl through the use of the surface response methodology.

A composit design of four factors was used as the experimental design in this research as it permits the use of the response surface methodology in a cubic field.

The response used in the exploitation of the design was the determination of the inhibitor efficiency. It was assessed through gravimetric measurements on samples in the absence and presence of the inhibitor.

Our study also put a point on the adsorption of LEUCINE alone and in combination with iodide ions on the metal surface which is found to obey the Langmuir isotherm. The values of ΔG_{ads} obtained refer to the Phenomenon of chemical adsorption.

Keywords: Experimental designs, Corrosion inhibition, Composit design, Iodide ions.

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Biography

Jamila Lazrak is a Ph. D student in the first year, specialty chemistry, at the Faculty of Sciences Dhar Mehraz, University Sidi Mohamed Ben Abdellah. His subject is based on the study of Tool chimiometrique for the study of the inhibition of the corrosion of a metal by amino acides

Response Surface Methodology for the optimization of 4-Nitrophenol degradation by a heterogeneous Fenton-like reaction on Moroccan pillared clays

Baragh Fidâ[1,2], Draoui Khalid[3], El Bali Brahim, Agunaou Mahfoud[1], Kherbeche Abdelhak[2]

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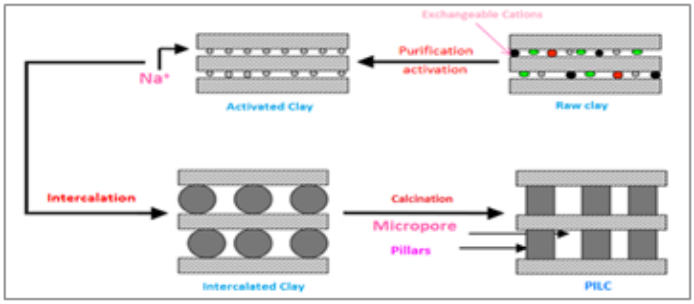
Abstract

Organic non-biodegradable pollutants have increasingly become a serious environmental issue and a real challenge for industries and thus disposing safely these compounds is becoming a necessity and an important area of research. Among other processes used to deal with these recalcitrant pollutants, Catalytic wet peroxide oxidation (CWPO) using pillared clays has attracted considerable attention.

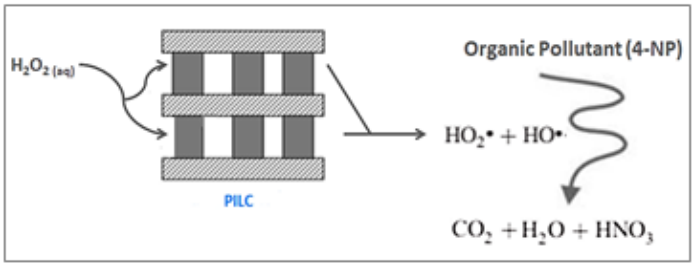
Pillared interlayered clays (PILCs) have attracted great attention in the past three decades, because of their abundance, ecofriendly, low cost, high stability and great flexibility for applications in adsorption and catalysis. It is a family of porousmaterials containing micropores that are larger than those of conventional zeolites, and thus exhibit new properties according to the nature of the pillars.

In this study, Heterogeneous Fenton-like reactions on pillared clays were investigated for the degradation of 4-Nitrophenol (4-NP). A Box–Behnken design coupled with response surface methodology (RSM) was applied to evaluate and optimize the important variables. A significant quadratic model (P-value < 0.0008, R^2= 0.9526) was derived using analysis of variance (ANOVA), which was adequate to perform the process variables optimization. More than 90% of 4-NP was experimentally degraded after 4h of reaction time under the optimum conditions.

Keywords: 4-nitrophenol, pillared clay catalysts, catalytic wet peroxide oxidation, Box–Behnken design, and responsesurface methodology.



Preparation of Pillared clay catalysts (PILC)



Catalytic wet peroxide oxidation using PILC

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Biography

The author is a process, energy and environmental engineer. She studied the wastewater treatment using advanced oxidation processes and especially using natural clays as catalysts in order to reduce and eliminate water pollution by organic pollutants. She won the price of the best presentation in ECGP'14 held on December 5th-7th, 2017 in IMT Douai, France.This project is under Financial support by CNRST-Maroc (Projetsdans les domainesPrioritaires de la Recherchescientifique et du développementtechnologique PPR2)qualified for the preparation of the national doctoral degree at Faculty of Sciences ChouaibDoukkali University (UCD) El Jadida, Morocco.

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The influence of the canopy on the horizontal wind out-flow

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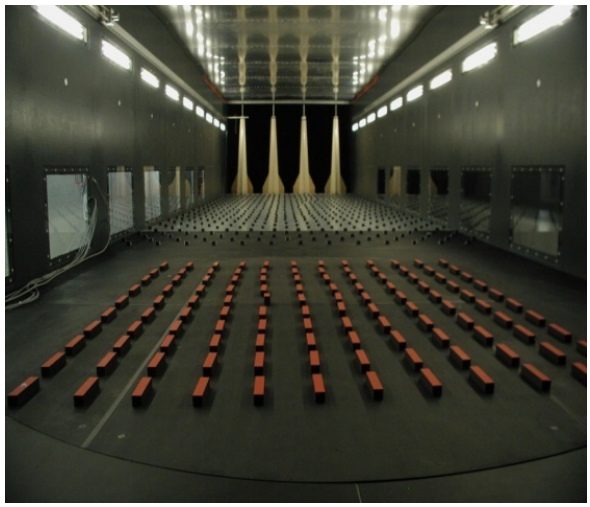
Abstract

The Simulation of the physical phenomena to the scale of the urban canopy constitutes an important stake therefore. Among these phenomena, the scattering in an urban environment was the subject of numerous previous studies, which presents some limits nevertheless. First, most these studies cut down to the assessment of the middle concentrations. However, the fluctuations of the concentrations are also important for the assessment of the risks, the effects harmful of some pollutants capable to be characterized by scales of time of the order of the second. Besides, most studies of scattering are led therefore in conditions of neutral and neglectful atmosphere the thermal effects of the buildings. The urban structure yet modifies meaningful manner the balance radiative, and the cities develop a local stratification thus. Our micro-meteorological simulation works in the present city therefore a main objective. It is the survey retailed of the out-flow in the cities, while simulating the fields of speed and the turbulent kinetic energy at a time. In it, we do numeric simulations while solving the buildings explicitly, with the help of a model of CFD (Computational Fluid Dynamics). We use the CHENSI code (developed by Dynamic Team from the atmosphere in the central school of Nantes, France); a three-dimensional model adapted to the atmospheric out-flows.

Key words: Urban, Dynamics, horizontal, CHENSI code, k–ε model, MUST.



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Biography

Author has her expertise in urban poullution and mechanical domain of fluid and atmosphere. She was warded her PhD in 2017 from the University of Mostaganem, Algeria. She published more than 05 papers. Her H-index is 1 on Scopus.

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Rapid sample screening method for authenticity controlling vanilla flavours using liquid chromatography with electrochemical detection at aluminium doped zirconia nanoparticles-modified electrode

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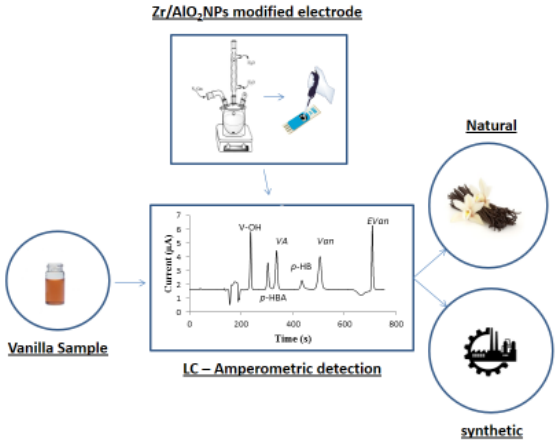
Abstract

Considered a major flavoring product, natural vanilla faces many frauds. Thus, several analytical methods have been optimized in order to determine its chemical constitution. Moreover, the use of screen-printed electrodes as electrochemical sensors capable of detecting several compounds in numerous sectors have significantly increased over last years due to their high selectivity, reproducibility, low-cost production, simple modification surface and the increasing miniaturization challenge. In the present work, a screen-printed carbon electrode (SPCE) was modified using a composite film of AlO_2 nanoparticles doped with Zr (Zr/AlO_2NPs) in the aim of providing a high sensitive and selective electrochemical sensor for the amperometric quantification and detection of adulterations in vanilla flavors. Zr/AlO_2NPs were synthetized and characterized by X-ray diffraction. SPCE was then modified using an optimal volume of Zr/AlO_2NPs and compared with non-modified SPCE by cyclic voltammetry on dopamine. Further, the home-made sensor was employed for the development and validation of a new analytical method using high pressure liquid chromatography with amperometric detection of six phenolic compounds of vanilla flavors namely; vanillin, *p*-hydroxybenzoic acid, *p*-hydroxybenzaldehyde, vanillyl alcohol, vanillic acid and ethyl vanillin. The proposed method allowed the quantification of vanilla compounds at 0.5-10 mg/L linear range. The limit of detection, limit of quantification and relative standard deviations were inferior to 0.14 mg/L, 0.48 mg/L and 4.76%, respectively. The natural origin of real samples was finally investigated by discriminating the vanilla phenolic compounds where several cases were obtained and discussed.



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Biography

Authoris a PhD student at Department of Analytical Chemistry and Food Technology, working at the Regional Institute for Applied Science Research (IRICA) at University of Castilla-La Mancha (UCLM), Spain, since 2016. He received hismaster's degree in process, energy and environmental engineering in 2016 from Ibn Zohr university in Agadir, Morocco. Histhesis work is aimed at the development and validation of new analytical methods involving nanomaterialsfor environment and food field.

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Zinc carboxylates used as anticorrosive pigments: corrosion inhibition of steel by water extract in NaCl medium

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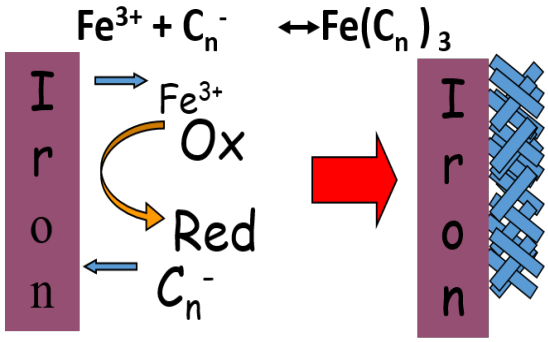
Abstract

The development of new anticorrosive pigments for paints is mainly guided by the replacement of polluting substance. In this framework, organometallic zinc(II) compounds was evaluated as pigments to replace phosphate anions with non-toxic carboxylate anions. For that lamellar zinc carboxylate, zinc heptanoate (ZC_7) and zinc decanoate (ZC_{10}) was simply synthesized by co-precipitation method and characterized by X-ray-diffraction. The corrosion inhibition performance of the pigments on steel was studied by using pigments extracts in NaCl corrosive medium through with stationary and dynamic electrochemical measurements (EIS). The composition and morphology of the films precipitated on the steel surface was investigated by XRD and SEM analysis. This corrosion inhibition performance of ZC_n pigments compared to hopeite pigments is due to the development onto steel surface of a protective layer of iron carboxylate in contact with ferric anions, released by the corrosion reaction of iron.

Figure



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Biography

Author has her expertise in corrosion science, especially anticorrosion pigments used in paints. The synthesis of an environment friendly pigments like modified natural clay minerals and modified layered double hydroxide and metallic carboxylates and their studies as corrosion inhibitors in NaCl medium.. He was warded her PhD in 2014 under joint supervision from the Cadi ayyad Universityof Morocco and Lorraine University of France. He published more than 8 papers and more than 20 communications.

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AlO_x-chitosan biodegradable nanocomposite development for the removing organic dye

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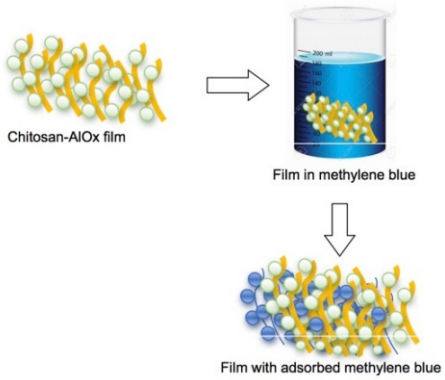
Abstract

A novel method was attempted for the development of alumina-enriched biodegradable nanocomposite which using sol-gel approach. To do that, the biodegradable chitosan was used as the organic matrix and aluminum ethoxide (AEO) as the inorganic metal precursor. The hydroxyl and amino group of chitosan was bonded to the ether functional group of AEO to develop, after the sol-gel process, an *in situ* composite of AlO_x network bonded to chitosan. To observe the bond formation, FTIR was used and found amide I, amide II and C=O vibrations in the spectrum. Authors have also given attention of the thermal stability of the nanocomoposite. With the help of thermogravimetry analysis, it was revealed that the amount of inorganic precursor added to the matrix was quantitatively bounded. It was found also that the nanocomposites have higher thermal stability than the pristine chitosan matrix. AFM and FESEM confirmed that, after the sol-gel process, the successfully bonded AlO_x with the chitosan are nanometer in size. The X-ray photon spectroscopy was used to study the surface chemistry of the composite films. This chitosan-AlO_x nanocomposite was tested for methylene blue adsorption and the removal of the organic dye was successful up to 65wt%. Authors have come to conclusion that this biodegradable organic-inorganic film nano-composite can be used for some environmentally green applications.



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Biography

Author received his Ph.D. from University of Bristol, in 2000. He is now a full professor at Kuwait University. His specialty is related to nanomaterials and nanotechnology with focus on surfaces and colloidal properties of nanomaterials. In his research, he targeted materials with environmental, renewable energy, sensors, and green chemistry applications. He was well trained on using neuron scattering facilities and he visited several times Rutherford Appleton Laboratory (ISIS, UK), Institut Laue-Langevin (ILL, France), National Institute of Standards and Technology (NIST) Center for Neutron Research (Gaithersburg, USA) and Oakridge National Lab (ORNL, USA). The author has over 60 peered revired publications and he is a frequent reviewer to over 50 international journals in the field of nanotechnology and surface chemistry. He was the chair of the first Kuwait International Nanotechnology Conference and Exhibition that was held in 2016. His H-index is 14 on Scopus.

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New compounds based on polythiophen for organic solar cells: A Quantum chemical investigation of structural and optoelectronic properties relationship

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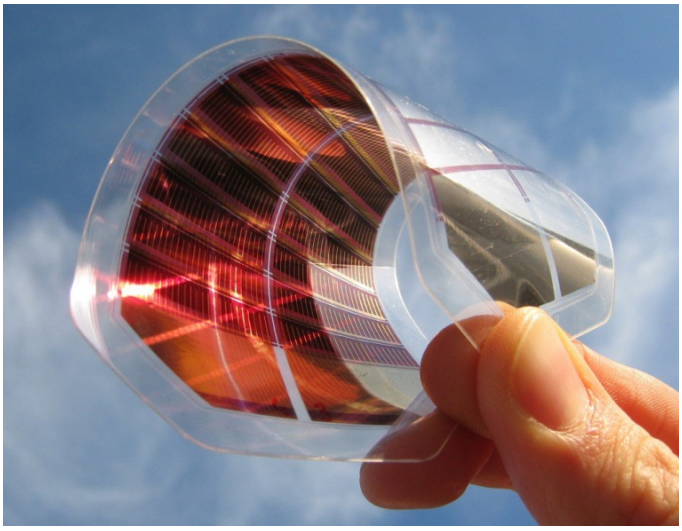
Abstract

In the last decade, organic electronic devices represent an important part of the electronic research, these electronic devices need special polymers and molecules with specific and adapted properties. π-conjugated molecules with low gap have received much attention for electronic and photovoltaic applications such as, electroluminescent devices, field-effect transistors and organic photovoltaic cells. Polythiophen have attracted much interest for potential application in opto-electronic devices due to their interesting optical and electronic properties. So, it's very important to study the electronic properties, photovoltaic properties and optical properties of these materials and to understand the nature of the relationship between the molecular structure and the electronic properties, which is necessary to benefit from their adaptive properties to photovoltaic application. In this context, quantum chemical methods have been increasingly applied by using density functional theory (DFT) and time-dependent (TD) calculations. In this work, the study of the structural and optoelectronic properties (HOMO, LUMO, Gap energy, Voc) is realized by using DFT method at Becke's three-parameter functional and Lee– Yang–Parr functional (B3LYP) level with 6-31G(d) basis set. The calculations were performed by Gaussian 09 program supported by Gauss View 5.0. Besides, Time-Dependent Density Functional Theory (TD/DFT) calculations were used to enumerate the absorption properties like the maximum absorption wavelengths, the excitation energy and oscillator strengths corresponding to molecules studied our results lead to the likelihood to suggest these materials for organic solar cells application.



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New treatment for the protection of heritage steel against atmospheric corrosion

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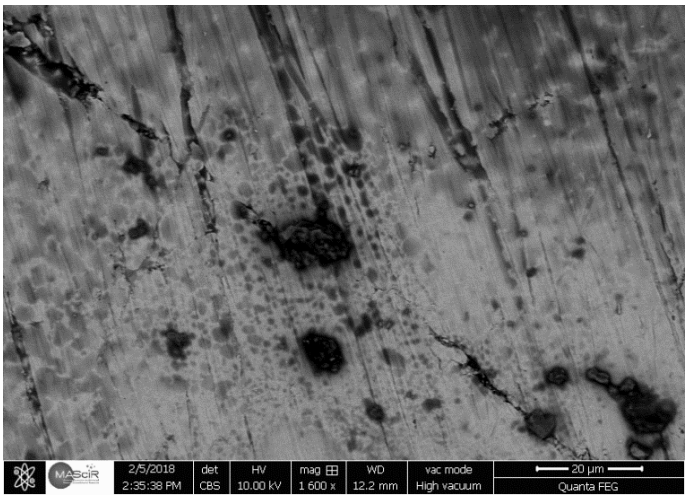
Abstract

Atmospheric corrosion of ferrous alloys is a complex natural phenomenon, governed by several physicochemical factors such as ambient temperature, relative humidity and salinity. In the case of museum objects, conservators have proposed various techniques based on corrosion inhibitors, waxes or varnishes in order to stabilize objects. This work aim is to develop a new corrosion inhibitor treatments free from toxins and reversible. In this context, two families of organic molecules are studied, a sequestering agent and a heterocyclic aromatic compound. This study is carried out on uncorroded and corroded iron coupons , using electrochemical methods, stationary polarization curves and electrochemical impedance spectroscopy (EIS), coupled by X-ray diffraction analyzes. and imaging by metallographic microscope. The results obtained during this work show an important inhibitory efficiency. In order to simulate the atmospheric conditions, the chosen electrolyte is the atmospheric medium of the ASTM D1384-87 standard



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The effect of Pseudomonas aeruginosa biofilm on the corrosion behavior of copper in an artificial drinking water

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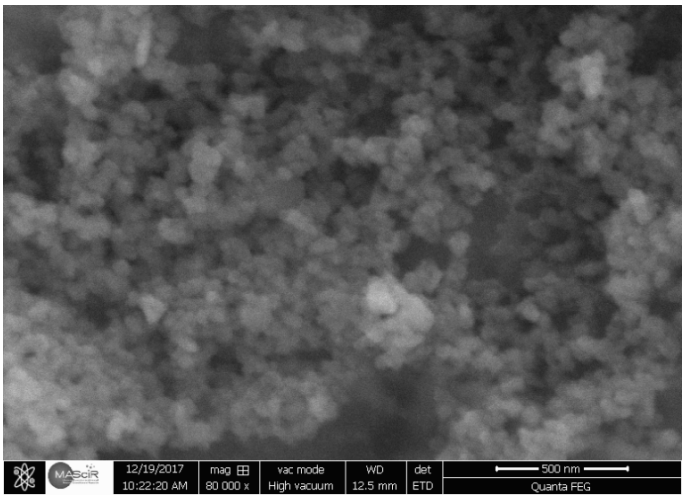
Abstract

Atmospheric A biofilm is a heterogeneous bacterial community from metabolic activities and growth point of view. However, it is highly structured and colonizes solid surfaces. This structure represents the normal way of a bacterium life. Biofilms are found on mineral, plant and animal surfaces, but also in water systems that are ideal places for the biofilms formation. in order to implement the corrosion phenomena due to biofilm, a study of copper behavior in a simulated drinking water inoculated with a bacterial suspension was made. P. aeruginosa is a water isolate from a drinking water pipeline in a pilot system. the Identification was performed according to analytical microbiology techniques to study the corrosion behavior of copper in the presence of the Ps strain stationary (polarization curves) and transient electrochemical methods have been exploited. inductively coupled plasma spectrometry (ICP-OS) was used to monitor the evolution of free Cu^{2+} ions in solution, using scanning microscopy technique a study of the surface composition and morphology in the presence and in the absence of the biofilm has been made. In order to study the effect of the bacterial strain on the medium, the evolution of abandonment potential and pH have been monitored. All results and observations confirm the influence of the isolated bacteria on the corrosion behavior of copper in the studied medium, either through metabolic effect due to bacterial growth or by biofilm formation.



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Study of corrosion behavior and dezincification of single-phase Cu-Zn alloys in drinking water

R. Lachhab, R. Belkhmima, A. Ech-Chebab, M. Ebntouhami

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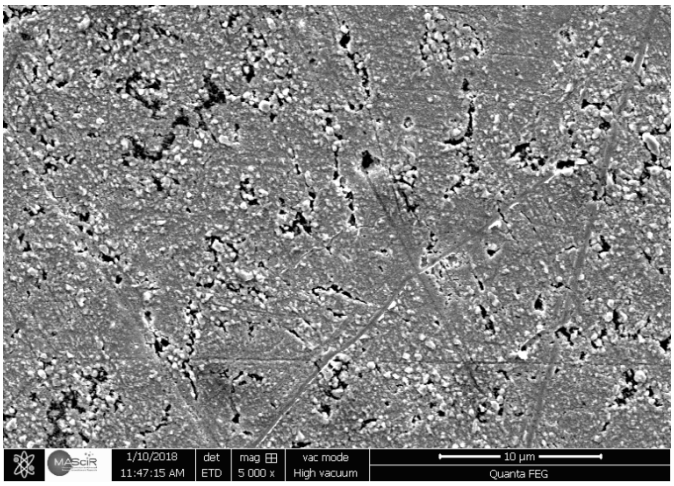
Abstract

Cu-Zn alloys are widely used in various industrial and domestic fields, these alloys are therefore of interest to researchers. In particular, their resistance to corrosion determines the application sectors for each alloy. The presence of the α phase, the contents of chemical elements such as Al, Ni, As, Fe, Mn can act directly on the corrosion behavior of these alloys in aqueous solutions. This contributes to the study of the corrosion behavior of Cu-Zn αalloys in drinking water and the determination of protection mode for each alloy, so this work aims to characterizethe action of certain chemical additives on the corrosion resistance of the studied surfaces. In this context, stationary (trace polarization) and transient (EIS) electrochemical methods have been used for the corrosion study.

The study of the metal surface is provided by X-ray diffraction analyzes and Scanning electron microscopy coupled with EDX. The dezincification factor has been studied by ICP. The results obtained during this work revealed that the percentages of the α and β phases and the presence of some elements in the surface composition modified significantly the corrosion and resistance behavior as well as the dezincification of Cu-Znalloys.



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Study of the effect of acid concentration on the protection of industrial steels in hydrochloric acid pickling baths by quinoxaline molecules

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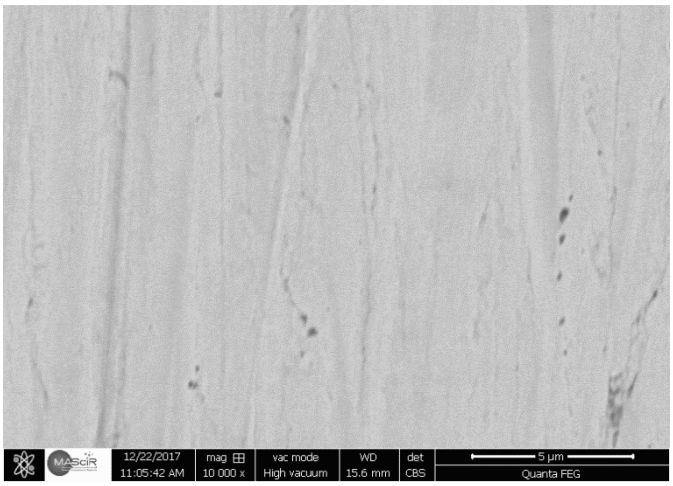
Abstract

In the industrial sector, surface treatments present the most important and delicate phase. Pickling is the removal of oxides and traces of corrosion from the metal surface. Hydrochloric acid is the most widely used in these treatments, however the problem of corrosion remains the major risk that can cause irreversible damage in the base material. Corrosion inhibitors are one of the most cost-effective solutions for corrosion in pickling baths. The surface composition and the acid concentration can significantly affect the inhibitory performance of a molecule. In this context, this work contributes to the study and protection against corrosion of two types of steel by adding 3 inhibitors based on the quinoxaline family. Two concentrations of HCL are evaluated (0.5M and 1M). This study is carried out on breast steel coupons, is conducted by electrochemical methods, plotting stationary polarization curves and electrochemical impedance spectroscopy (EIS), coupled with analysis and imaging by metallography and EDX microscope. The results obtained during this work focus on the effect of acid concentration on inhibitory efficiency and the contribution of surface components to improve inhibitor performance. Thus, the molecules studied revealed a promising inhibitory efficiency, the evaluated treatments were applied on artificially corroded parts in order to prove the effectiveness of the formulated bath.



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Effects of jet velocity and impingement angle on the erosion-corrosion behavior of ECOBRASS & DZR alloys in drinking water

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Abstract

Erosion-corrosion is one of the major responsible factors of material degradation in hydraulic components (pumps, elbows, piping, and valves).in fact, the interaction between mechanical erosion and electrochemical corrosion accelerates the degradation mechanisms, thus, the material loss will be higher than the sum of the damage caused by erosion and corrosion acting separately.

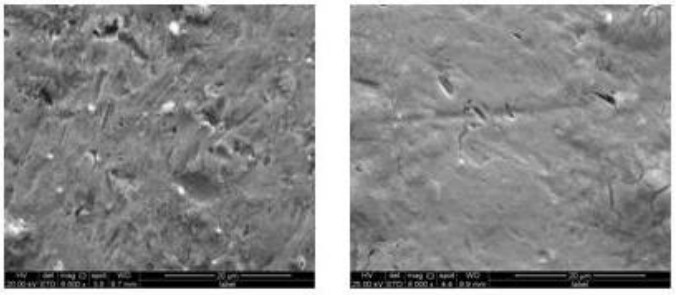
The objective of this work is to study and compare the erosion-corrosion behavior of two types of brass, DZR (CuZn36Pb2As) and ECOBRASS (unleaded alloy) in drinking water at various impingement angles and jet velocities.

All tests were carried out by using an impingement jet device, which is made up of a rotating sample holder able to be adjusted at different angles (0° to 90°); and a pump producing a variable flow of drinking water (jet velocity : up to 20 m/s) . the silica S_iO_2 (average size: 0.063-0.2mm) was used as a solid eroding particle.

Erosion-corrosion behaviors of DZR & ECROBRASS samples were characterized using Tafel polarization and electrochemical impedance spectroscopy (EIS) and scanning electron microscope (SEM).

The tests results showed that the maximum erosion-corrosion for DZR & ECOBRASS rate occurred at an impingement angle of 45°. And their erosion-corrosion resistance polarization was decreased with an increase in jet velocity; also in pure erosion test, ECOBRASS was more resistant than DZR. In contrast, in pure corrosion test, the DZR was more resistant than ECOBRASS.

Keywords: Erosion, corrosion, brass, impingement angle, jet velocity, silica.



SEM pictures of DZR & ECOBRASS samples after erosion-corrosion tests (during1h, impingement angle:45°, jet velocity:11m/s)

The Anti-corrosive behavior of three Gums Arabic from the north coast of Africa on the mild steel in acidic medium

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Abstract

The corrosion has the primary concern in the last decades, due to the excessive use of metals and it alloys in modern life. The mild steel like most metals can be exposed to some aggressive environments, as a result of an alterations by chemical and electrochemical reactions that lead to corrosion of the metal. Corrosion always causes a lot of damage and affects many areas. It is estimated, for example, that every year a quarter of the steel production is destroyed by corrosion, which corresponds to about 5 tons per second, Acacia gum collectedfrom acacia trees is one of the most common natural gums in sub-Saharan regions. It is a highly branched, neutral or slightlyacidic arabinogalactan polysaccharide. Besides itsknown biological activities, the GA is also known to have anticorrosive properties.

The current study focused to compare the inhibitive effect of three gums Arabic species collected from acacia trees found in the countries along the west African coast (Morocco, Mauritania and Senegal) on the corrosion of the mild steel in hydrochloric 1M medium. The study was performed by the gravimetric and electrochemical methods (EIS and polarization measurements), in order to confirm the adsorption of the gums Arabic on the carbon steel surface, the scanning microscopy electronic SEM were performed to preview the morphology of the surface. Moreover, some theoretical calculations were carried out by the DFT and molecular dynamic techniques in order to find a correlation between the effectiveness of the studied GA and their molecular structures.

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Biography

Authorhas graduated from the University of Mohammed first – Sciences Faculty (Oujda), where he undertook a PhD into the corrosion inhibition behavior of some Schiff base derivatives, during his thesis, he has developed skills in the electrochemical methods such as the voltammetry linear and cyclic, and electrochemical impedance spectroscopy (EIS),he published until now 25 papers.

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Stability analysis of a functionally graded plates with porosity using high order shear deformation theory

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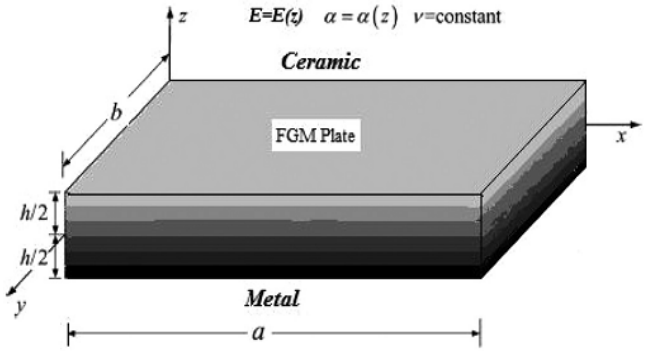
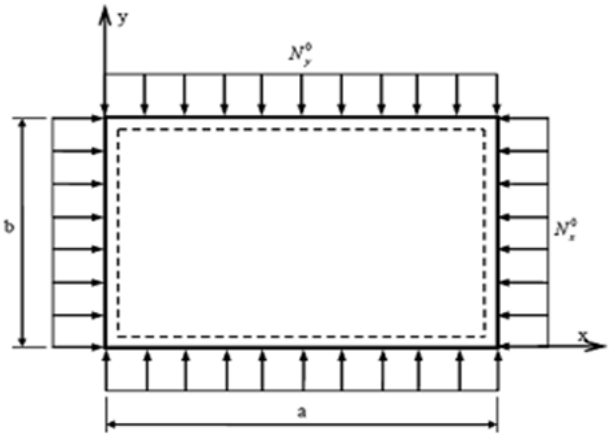
Abstract

Functionally Graded Material (FGM) is a type of material whose composition is designed to change continuously within the solid, the concept of FGM was first considered in Japan in1984 during a space plane project. The FGM materials can be designed for specific applications depending on the desirable characteristics of the structure, it had attracted much attention in many engineering applications due to their advantages of being able to resist high temperature gradient while maintaining structural integrity.

The aim of the present paper is to investigate a buckling analysis of a functionally graded plate under in-plane load taking into account the effect of porosity , the transverse shear stresses are incorporated using a high order deformation theory which doesn't need a shear correction factors and give accurate results , the mechanical characteristics of the FG plate vary through the thickness following a power law and the poisson's ratio is considered constant through the thickness, governing equations are derived from the principle of minimum total potential energy. The closed-form solution of a simply supported rectangular plate subjected to in-plane loading has been obtained by using the Navier method, a parametric study is carried out to show the effect of porosity and volume fraction on the behavior of the plate, also the effect of some geometric parameters is investigated, the accuracy of the present solutions is verified by comparing the obtained results with the existing solutions.





Biography

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Corrosion Inhibition of Al-alloy 7075 in 3,5% NaCl Solution by a Natural Inhibitor (Pumpkin Pepo)
An Electrochemical and Surface Study

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Abstract

Aluminium alloys have received unprecedented attention due to their high strength / density ratio, the wrought aluminium, zinc, magnesium and copper. AA7075 series alloys are being utilised in many areas such as the transport applications, aviation industry, bicycle components…
The inhibition of the corrosion of 7075 aluminum alloy in 3.5 % NaCl solution by Pumpkin Pepo has been studied using electro-chemical impedance spectroscopy (EIS), potentio-dynamic polarization and scanning electron microscopy (SEM). Inhibition efficiency reaches 95% for 1g/L. The adsorption of the PP on the 7075 aluminum alloy surface obeyed the Langmuir adsorption isotherm. The adsorbed film on 7075 aluminum alloy surface containing inhibitor was confirmed by the SEM. The results obtained shows that:**(1)**the Pumpkin Pepo (PP) acted as a cathodic inhibitor.**(2)**η% values obtained from different methods employed are in good agreement **(3)** The Pumpkin is a green corrosion inhibitor of AA7075 alloys in a 3.5% NaCl solution and adsorbed on the surface of AA7075 alloy according to the Langmuir adsorption isotherm.These results show that the Pumppkin Pepo could serve as an effective corrosion inhibitor of 7075 aluminum alloy in 3.5% NaCl solution.

Key words: corrosion, inhibition, Al-alloy 7075, 3.5 % NaCl, Pumpkin Pepo, electrochemical methods, Langmuir, EIS, SEM.

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Experimental investigation of corrosion inhibition of Aluminums alloy alloy 2024-T3 in 3.5% of NaCl

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Abstract

Aluminum alloy AA 2024-T3 has been used in aircraft construction for over the years due to its high strength to weight ratio, extremely good damage tolerance and high resistance to fatigue crack propagation. The corrosion inhibition of Al 2024-T3 by two organic products namely (ER and SUL) in 3.5% of NaCl has been investigated at various temperatures using electrochemical techniques such as impedance spectroscopy (EIS) and potentiodynamic polarization. The polarization curves indicated that inhibitor tested acted as cathodic inhibitors. Inhibition efficiency (IE %) increased with the increase of inhibitors concentration to attain 93% at 10^{-2} M of ER and 98% at 5.10^{-3} M of SUL. The adsorption of tested compounds on the Aluminum surface in 3.5% of NaCl follows the Langmuir isotherm model. Data obtained from EIS studies are analyzed to model inhibition process through appropriate equivalent circuit models. The temperature effect on the corrosion behavior of Aluminum in 3.5% of NaCl without and with the inhibitor was studied in the temperature range from 298 to 328K. The adsorption free energy and activation parameters for the Aluminum dissolution reaction in the presence of ER and SUL were determined.

Keywords*: corrosion; inhibition; Aluminum; NaCl; EIS; Polarization.*

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Structural and spin crossover studies of coordination compounds based on 4H-1,2,4-triazole derivatives and pyrazole carboxylic acids

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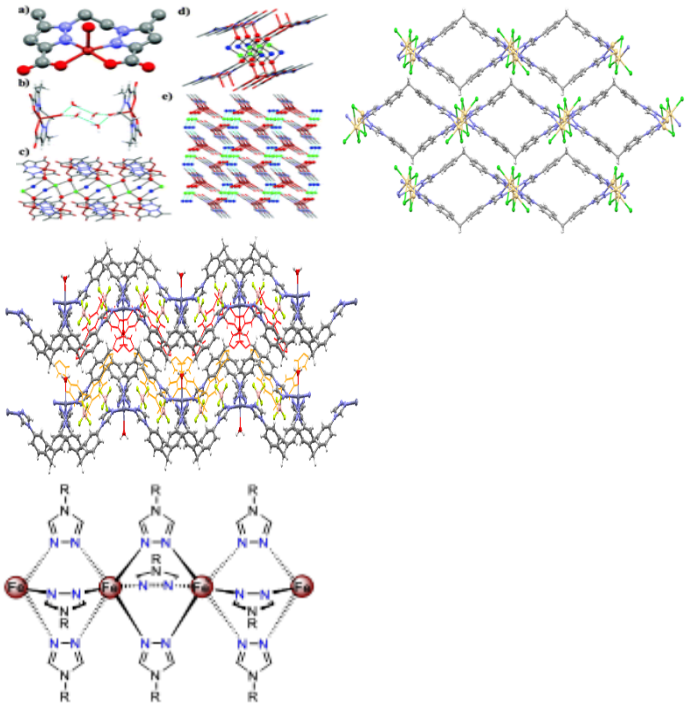
Abstract

In this work, we studied the properties of new inorganic complexes containing 1, 2,4-triazole and pyrazole carboxylic acid type ligands. These new ligands containing both N-donor and O-atoms are simultaneously adapted to coordinate various transition metal ions.[1] Developing strategies that allow the tailoring of such functional materials with predictable architecture and properties is an important objective and current interest in crystal engineering.[1] These compounds recently emerged as a new generation of smart materials due their various potential applications including gas storage, metallic mercury entrapment, gas sensing, luminescence, drug delivery etc.[2] Interestingly such materials can also display spin crossover (SCO) properties,[3] which is considered as a booming field in nanochemistry.[4] Crystal engineering tools are used to create such structurally intriguing and functionally diverse coordination polymer materials.[5] We present herein the study of Fe(II) 1D chains containing 4H-1,2,4-triazole hybrid ligands synthesized from thiourea derivatives. Their SCO properties were studied by temperature dependent SQUID magnetometry and ^{57}Fe Mössbauer spectroscopy, both for solvated and desolvated complexes. Important structural property relationships will be discussed, as well as rare observation of SCO around room temperature, a discovery which bears interest for optical sensors and smart displays.



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Biography

Houria Benaissa is a PhD student in the laboratory of Prof. Yann Garcia at the Institute of Condensed Matter and Nanosciences (IMCN) of the **Université catholique de Louvain** (Louvain-la-Neuve, Belgium). Her work is based on the synthesis and characterization of new molecular based magnetic materials exhibiting spin crossover phenomena with photo and thermochromism. She collaborates closely with Prof. Smaail Radi on coordination polymers engineering and is included in the COP 22 WBI programme on environment nanoscience leaded by Prof. S. Radi and Prof. Y. Garcia. In 2017, she received the *Dalton Trans.* poster prize from Prof. Hiroki Oshio (board member) in Béni-Mellal (Morocco).

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Effect of chloride ion on steel reinforcement corrosion in concrete powder solution extracts (CPSE) in the presence of sulfate ions.

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Abstract

The corrosion of the reinforcing steel is very worrying because it is probably the most common cause of the degradation of reinforced concrete. Initially, the reinforcing steel naturally protected against corrosion by the high alkalinity of concrete's interstitial solution. However, this passive state can be inhibited by the destruction of the passive film by aggressive ions (chlorides, sulfates) or by acidification of the environment in the vicinity of the reinforcing steel (carbonation). The corrosion of the reinforcing steel is the natural result of the penetration of chloride into the reinforced concrete.

In this work, an experimental study was conducted to evaluate the corrosion behavior of steel in concrete powder solutio extracts (CPSE) from various concrete mixtures.The corrosion behaviour of steel immersed in concrete powder solutions extracts contaminated with different concentrations of chloride and sulfate ions, was studied by electrochemical impedance spectroscopy [EIS] and potentiodynamic polarization measurements [PP]. The concrete powder solution extracts (CPSE) were prepared from concrete mixes made with a normal-weight aggregates concrete (NAC) and two of lightweight aggregate concrete (LAC). Experimental results showed different zones of corrosion of steel reinforcements. XRD analysis was also performed on concrete powder samples to analyze the formed products due to the presence of chloride in the absence / presence of sulfate ions.

In addition, the results of the electrochemical studies indicated that the passivity range of the steel reinforcement decreased with the increase of free chloride ion concentration in both the absence / presence of sulfate ions. Moreover, Sulfate ions attenuated the effect of chloride ions in reducing the passivity of steel and the presence of higher concentrations of sulphate ions can reduce the risk of pitting corrosion as chloride tolerance increases with increased concentration of sulfate ion in both concrete solutions.

Keywords : *Reinforcing steel ; EIS ; Potentiodynamic polarization ; Corrosion ; Chloride ; Sulfate ; XRD ; concrete powder solution extracts.*

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Setting Properties of Calcium Phosphate Bone Cements

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Abstract

Calcium phosphate cements (CPCs) are widely used in bone repair. CPCs show many advantages comparing to other calcium phosphate-based materials. Currently there are two main types of CPCs, brushite and apatite. An apatitic calcium phosphate cement is obtained by mixing α -tricalcium phosphate (αTCP) and hydroxyapatite (HA) with dicalcium phosphate dehydrate (DCPD) into a cement powder, and by then mixing this powder with an aqueous solution of Na_2HPO_4 as an accelerator at two different liquid-to-powder ratios L/P (0.35 and 0.50 mL/g). The cement samples are then soaked in water at 37°C for periods ranging from 1 day to 29. The objective of this study was to investigate the influence of paste concentration controlled by liquid-to-powder ratio on the sitting times and on the phase composition of α-TCP based calcium phosphate cements. The cements were characterized in terms of setting time. Also XRD technique is employed to evaluate the phase composition. The results reveal that by reducing the L/P ratio from 0.50 to 0.35, initial and final setting times of the CPCs decreased 15 and 9 minutes respectively. Also the powder XRD data shows that the cement samples soaked in water partially transformed into calcium deficient hydroxyapatite.

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Exploitation of local natural clays for the adsorption of heavy metals from wastewater: case of nickel ions

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Abstract

During this work, we have been able to optimize the adsorption rate of the heavy metals contained in the synthesized solutions of water charged with nickel, based on the adsorption process by two types of natural clay of the ELOulja regions. -Salé and Ain Dourij-Ouazzane from Morocco.

The results of this study show that the adsorption of nickel ions by the clay which was taken from the ELOulja-Salé region was more efficient than that which was made by the clay taken from the region Ain Dourij-Ouazzane. The difference obtained in terms of the obtained performance can return to the speed of the adsorption the nickel by the clay of the ELOulja-Salé region, while increasing the masses of adsorbent, the pH, the time of contact and the contents ions nickel.

Based on the kinetic adsorption study and the Langmuir and Freundlich adsorption model equations, the linear forms of which show that the maximum adsorption capacity of nickel ions is adequate with the Langmuir isothermal models and Freundlich.

Keywords: Exploitation, Adsorption, Clay, nickel, Comparative study, Isothermal models.

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Structure of Pentylenediammonium hexachlorostannate(IV)

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Abstract

This work is part of our study of crystal structures and vibrationnal properties of alkylammonium and alkylenediammonium metal halogenides. Up to now, little attention has held to the compounds of the type $[NH_3(CH_2)nNH_3]MCl_6$. Single crystal was obtained by slow evaporation, at room temerature of an hydrochloric acid solution containing stoichiometric amounts of $[H_3N-(CH_2)_4- NH_3]Cl_2$ and anhydous $SnCl_4$.This crystal is transparent, non hygroscopic and of sufficient size to achieve the structural study. Data were collected on BRUKER SMART 1K CCD diffractometer using MoKa graphite-monochromated radiation. The structure was solved by direct methods.

The crystal structure of Pentylenediammonium hexachlorostannate(IV) was determined by X-ray diffraction. This compound crystallize in the orthorhombic space group Pbca. The structure consists of isolated $[H_3N-(CH_2)_5- NH_3]^{2+}$ cation and $(SnCl_6)^{2-}$ anion, wish adopts a slightly distorted one in compound. The shortest N...Cl distances indicate that an extensive hydrogen-bonding network connects the ions. Single crystal was obtained by slow evaporation, at room temerature of an hydrochloric acid solution containing stoichiometric amounts of $[H_3N-(CH_2)_5- NH_3]Cl_2$ and anhydous $SnCl_4$.This crystal is transparent, non hygroscopic and of sufficient size to achieve the structural study.

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Experimental study of the corrosion inhibition of ordinary steel by glasses materials in 3% NaCl medium

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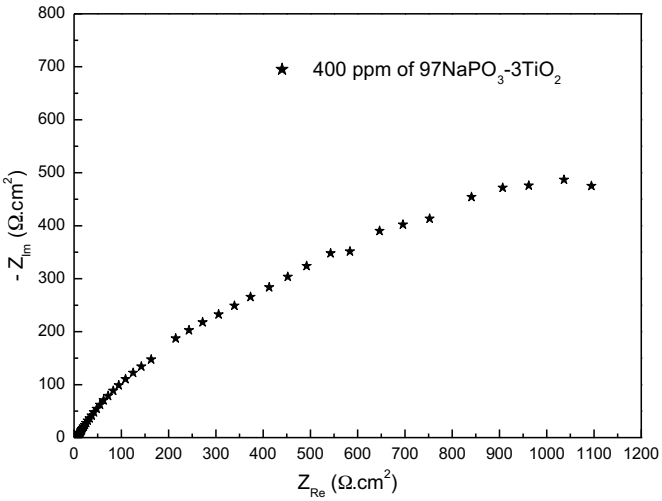
Abstract

All metal materials used in construction, especially ordinary steel, are used in aggressive environments; which leads their alteration [1]. Several methods of protection against corrosion have been developed, among these methods are cited the use of corrosion inhibitors. In practice, many formulations for the treatment of water have been used to remedy this problem [2]. As the new directives concerning industrial discharges are becoming more and more severe in terms of ecology, the development of eco-compatible and biodegradable corrosion inhibitors is becoming a major issue today.

In this work, we investigated the corrosion inhibition of ordinary steel in 3% NaCl by using two inorganic compounds namely $NaPO_3$ and 97 $NaPO_3$-3TiO_2.

This study was carried out by different electrochemical techniques. The results obtained show that these compounds have a better inhibitory efficiency which reaches 92 % at 400 ppm of $NaPO_3$ and 94 % at same concentration of 97$NaPO_3$-3TiO2 and it depends on the inhibitors concentrations, and the immersion time.

Keywords: Glasses Materials, Corrosion inhibition, Ordinary steel, NaCl Medium, Electrochemical techniques.



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Biography

Author has his expertise in Materials and synthesis of vitreous compounds. he was received his PhD in 2001 at Ibn Tofail University, Morocco. He had published more than 15 papers in international journals with H-index = 8.

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Development of anti-corrosive Titanium nitride coating using high power impulse magnetron sputtering

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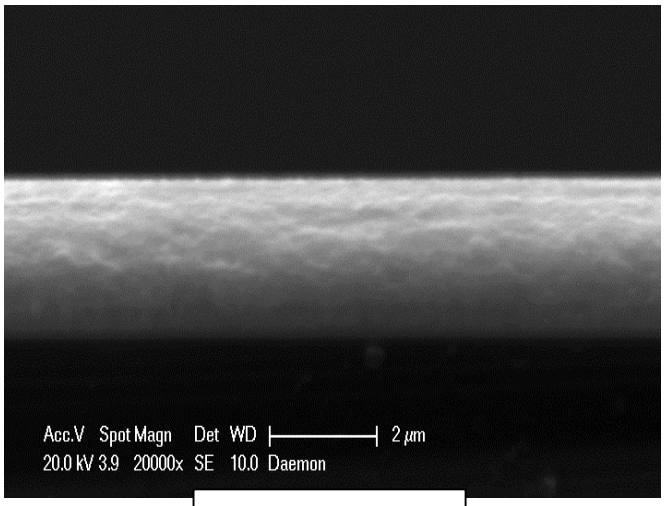
Abstract

Titanium nitride, TiN, is known to be used as a protective coating against corrosion for steel substrates [1]. Arc evaporation is the preferred deposition technique of TiN as it results in a dense morphology and good mechanical properties. However, due to the formation of droplets, which act as "easy" corrosion attack points, magnetron sputtering has been investigated as an alternative deposition technique. However, it has been found that coatings deposited by direct current magnetron sputtering (dcMS) process contain micro-pores resulting from columnar growth mode, typical for dcMS [2]. These porous areas represent diffusion channels to attack the substrate [3].

In the present work, HIPIMS, a highly ionized pulsed magnetron sputtering deposition technique that results in increased densification of deposited coatings, is used. The inherent micro porosity of TiN was reduced by using HIPIMS while taking into account the deposition rate. The reduction in porosity was qualitatively indicated by comparing the cross sectional morphology of HIPIMS and dcMS deposited films. Coatings deposited using a magnetic field strength of 55mT (with all other parameters considered constant)exhibited a featureless morphology and had the highest deposition rate. The influence of varying the magnetic field strength in the range [55 mT - 103mT] on deposition rate and morphology is investigated and explained.



Morphology of TiN

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Biography

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Green synthesis of titanium oxide and evaluation of their performances as anode material for lithium ion batteries

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Abstract

Transition metal oxides hold great potentials and have attracted much attention because of their high specific capacities and performances since they were first reported as active anode materials for lithium-ion batteries (LIBs) [1]. TiO_2 has been particularly attractive for large-scale energy storage, because TiO_2 is an abundant, inexpensive, and environmentally benign material with various types of nanostructures available. Also, TiO_2 is structurally stable with a small volume change (<4%) during Li ion insertion/ extraction processes and intrinsically safe by avoiding Li electrochemical deposition [2]. In this work, we synthesized a titanium oxide materials by using the gelation of biopolymers method. The structural and the morphological characterization of the as-prepared sample were carried out using XRD, Raman spectroscopy, and FE-SEM. The electrochemical measurements were conducted by using 2032 coin cells assembled in an argon-filled glove box. Galvanostatic charge/discharge was carried out in the voltage range of 0.8–3.0 V and cyclic voltammetry was performed over a potential range of 3.0–1.0 V with a scan rate of 0.02 mV s^{-1}. The calcined sample at 300 °C shows peaks at 2θ values which correspond to anatase diffraction planes as shown Figure 1. Identical conclusions as those derived through XRD about the crystalline phase of TiO_2 were confirmed by Raman spectroscopy. The charge/ discharge profiles of the TiO_2 electrode at a current rate of C/10 are giving in Figure 2. The discharging plateaus at ~1.7 V indicates the Li-intercalation into anatase TiO_2 lattice and the charging plateaus observed at ~1.9 V represented the Li-deintercalation of $LixTiO_2$. Our sample shows an initial Coulombic efficiency of 78% and promising reversible capacity of 152 mAh g^{-1}, as shown in Figure 2.

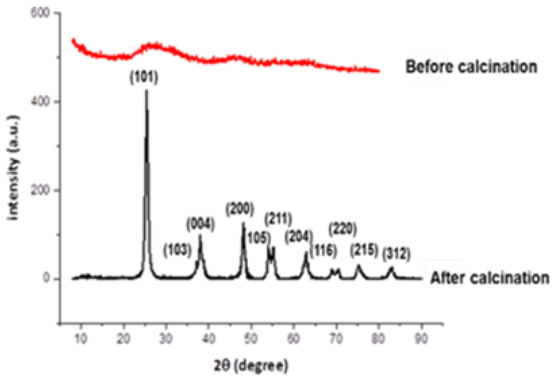

Figure 1: XRD pattern of TiO_2 sample

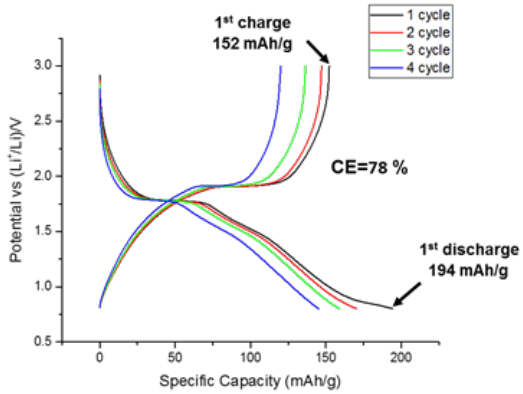

Figure 2: Galvanostatic charge–discharge curves of the TiO_2 between 0.8 V and 3.0 V (vs Li/Li+) at C/10 current rate

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Biography

Mr Karim EL OUARDI, 28 years old, is a second year PhD student at University Mohammed VI Polytechnic and University Hassan II Casablanca since October 2016. He received a bachelor degree in chemistry in 2013 and a Master degree in Materials engineering in 2015 from University Hassan II Casablanca. His research interests the development of nanocomposites based on graphene and metal oxide nanoparticles for energy storage application.

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Flaxseed grafted polyacrylamide aspossible green corrosion inhibitor for low carbon steel

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Abstract

Green corrosion inhibitors especially of organic nature are considered to have a high anti-corrosion efficiency in steel protection without any environmental limitations.**[1]** Therefore it is necessary to identify potential and highly effective corrosion inhibitors as well as to develop and improvethese compounds or combinations by new formulations. In this regard solutions based on natural and sustainable resources are of great value and a part of this research focus. In the present work we synthesized a new green polymeric material, so called "flaxseed grafted Polyacrylamide" (flax-g-PAM). This compound was generated by grafting the monomeric building block acrylamide onto extracted and purified flaxseed mucilage. The subsequently applied radical polymerization was realized in an aqueous system usingceric ion/nitric acid as redox initiator.**[2]** The structural characterization of the resulting polymeric inhibitor system was carried out using FTIR-spectroscopy. The electrochemical experiments were performed using a conventional three-electrode cell assembly with samples of low carbon steel (CR4 / DC01) in 0.1 M NaCl and 0.1 M H_2SO_4. The potentiodynamicpolarization studies were carried out over a potential of +250 to -250 mV with respect to the equilibrated open circuit potential (OCP) at a scan rate of 0.5 mV s^{-1}.
The FTIR spectrum in Figure 1 shows characteristic peaks for the flax-g-PAM composition and contains C=O amide, –NH, –CN stretching and –C–C–N asymmetric stretching confirming the successful grafting process. The inhibition efficiency of the new flax-g-PAM inhibitor increased with increasing inhibitor concentration up to a maximum of 96% for 100 ppm at 25 °C. Further investigation is under progress concerning temperature and concentration effect, impedance behavior as well as the inhibitor adsorption.

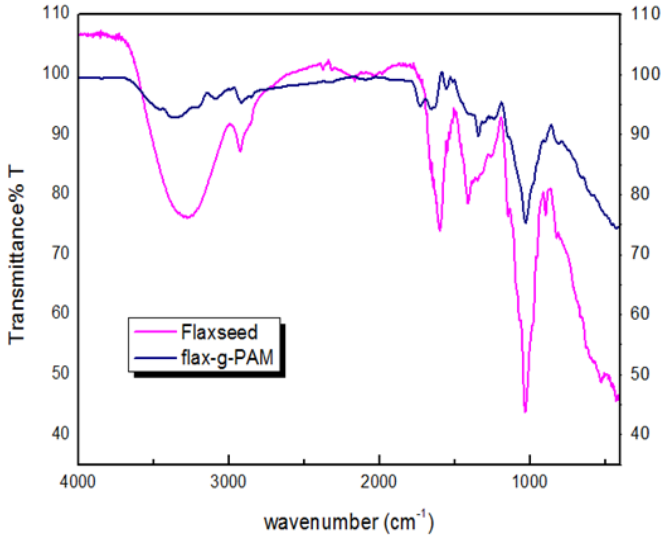

Figure 1: IR spectra of flaxseed mucilage and flaxseed grafted-PAM

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Biography

Ms. Chaymae HEJJAJ, 25 years old, is a first year PhD student at Mohammed VI Polytechnic University and Cadi Ayad University. She received a bachelor degree in physico-chemistry of Materials in 2014 and a Master degree in Functional Materials in 2016 from FSTG (Faculty of Science and Technology) Cadi Ayad University. Her research interests on green corrosion inhibitors and pigmented coatings using phosphate.

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Production of Cellulose Nanocrystals from Various Lignocellulosic Materials and its Application in Polymer Composites Development

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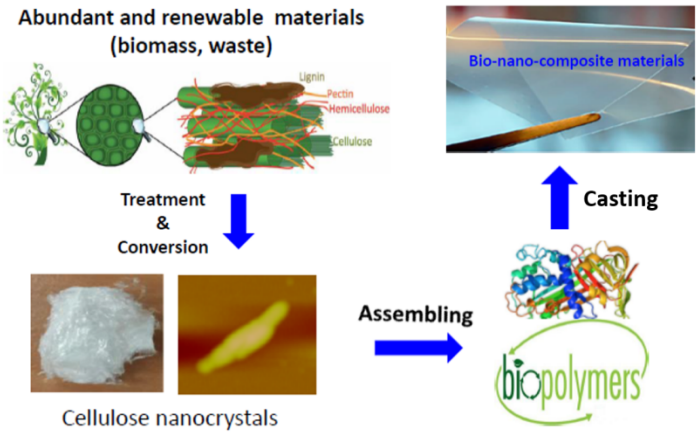
Abstract

In recent years, much attention has been given to biopolymers with a focus on sustainable development and environmental preservation. Following this tendency, the attempt has been made to replace polymers derived from petroleum with superior biodegradable polymers (biopolymers); nevertheless, some of their physicochemical properties are required to be improved. Therefore, the addition of renewable source-derived fillers into biopolymer matrix allows us the possibility of producing novel nanostructured bio-nanocomposite materials with specific functional and structural properties.

With the emergence of nanostructured bio-composite materials, elongated rod-like cellulose nanocrystals (CNC) have attracted more attention in the field of nanotechnology. The aim of this study is to develop bio-composite films based on biopolymer matrices and reinforced with CNC using the solution casting method.

In this work, the CNC were extracted from various lignocellulosic materials (red algae waste, alfa fibers and sugarcane bagasse fibers) *via* sulfuric acid hydrolysis and then characterized using X-ray diffraction (XRD), thermos-gravimetric analysis (TGA), infrared spectroscopy (IR), transmission electron microscopy (TEM) technique, and atomic force microscopy (AFM). The as-extracted CNC were used as a nanoreinforcing filler to produce a variety of bio-composite films, using various biopolymer matrices. Then, the structural, optical transparency, water vapor permeability, thermal stability, and mechanical properties of all prepared bio-composite films were evaluated and discussed. The high performances of these bio-composite films are expected to have potential in biomaterials or packaging applications.

Figure



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Biography

Zineb Kassab is currently a PhD student at Materials Science and Nanoengineering Department, Mohamed VI Polytechnic University, in collaboration with the Faculty of Sciences Ben M'sik, Hassan II University. Her research interests focus on the development of structured bionanocomposite materials for food packaging applications.

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Indoor and Outdoor Air Quality Analysis for the City of Nablus in Palestine: Seasonal Trends of PM_{10}, $PM_{5.0}$, $PM_{2.5}$ & $PM_{1.0}$ of Residential Homes

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Abstract

Nablus city is an important urban and industrial center in the West Bank, Palestine. The topography of the city, combined with multiple sources of air pollution, creates a potential air quality problem that might affect human health. The indoor and outdoor particle concentration distributions of PM_{10}, $PM_{5.0}$, $PM_{2.5}$ and $PM_{1.0}$ were measured using a Grimm aerosol spectrometer from December 2014 to November 2015, at four roadsides and four urban homes in Nablus. The results of the annual averages of PM_{10} and $PM_{2.5}$ concentrations were found to be at least three times higher than that of the European Air Quality Standards both in indoors, as well as outdoors. The difference in the results between both the roadside and the urban areas was attributed to human and industrial activities in Nablus. The results revealed that the highest concentrations of the particulate matters are during summer, especially June and July, in the roadside areas due to heavy industrial activities during these months. The same behavior was noticed for urban areas during summer, and due to other human activities. The results of indoor/outdoor (I/O) ratios were found to be less than, but very close to, 1 for both roadside and urban areas in summer and winter months. In winter times, areas with poor ventilation indicated the existence of additional sources of PM within indoor environment, especially when smoking cigarettes and using fuel based heaters such as fire places gas and kerosene heaters.

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Biography

Jodeh has wide range interest of research including environmental and water pollution, Preperation of nanomaterials from polymers and corrosion studies. Finished his Ph.D in Physical chemistry(1991) Wayne State University (USA), Postdoctorate Los Alamos National Labs, US Ministry of Defence(USA), More than 200 papers and 5 US Patents..

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Study of synergistic effects of amino tris (methylene phosphonic acid) and Zn^{2+} on the carbon steel corrosion in acidic media

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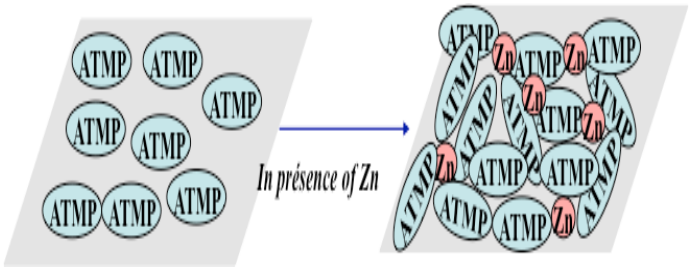
Abstract

Carbon steel is an important material used in chemical and petro-chemical industries due to its easy availability, excellent mechanical workability and low cost [1]. Corrosion, a very destructive chemical and electrochemical process, is one of the biggest problems encountered in this industry [2]. Acid solutions are widely used in industries for acid pickling, industrial cleaning, acid descaling, oil will acidizing and petrochemical processes [3].

The aim of this study is to investigate the phenomenon of synergism and also mechanistic aspects of corrosion inhibition of carbon steel in the presence of Zn-ATMP in HCl 1M solution.

Synergistic effects of amino tris (methylene phosphonic acid) (ATMP) and (Zn^{2+}) on corrosion inhibition of carbon steel in hydrochloric acid have been studied using weight loss measurements, polarization, EIS, adsorption and computational methods.

The results show that the inhibition efficiency depends on the ration ATMP/Zn^{2+}. The maximum value of inhibition effect is obtained for 10^{-2}M of ATMP and 10^{-3}M of Zn^{2+}. The synergism effects depend on temperature and ratio ATMP/Zn^{+2}. The synergistic parameter was found to be greater to 1. The adsorption mechanism obeys to Langmuir adsorption isotherm [4-5]. Quantum chemical studies confirm the experimental results.



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Biography

Holds a PhD in Materials Science, Assistant Professor at ENSET UM5, the author has a important number of works dealing with the evaluation and inhibition of the corrosion phenomena.

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STUDY OF PROPERTIES OF FLY ASH CEMENTS

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Abstract

Laboratory experiments in LafargeHolcim- Oujda- Morocco were conducted to investigate the effect of addition of fly ash on Ordinary Portland Cement OPC. In this study a portion of this cement was replaced by fly ash with different dosages (15%, 25%, 35% and 45%).
The results of these experiments showed technical benefits of fly ash cements compared to Portland cements:

- Less water demand.
- Less heat of hydration and less risk of early age cracking.
- High late strength gain.

However the inferior property of fly ash cements is lower early strength.

Keywords: fly ash, Portland cements, water demand, heat of hydration, strength.

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Posters

Extraction and characterization of chitin and chitosan: applications of the crosslinked chitosan in the adsorption of copper in an aqueous environment

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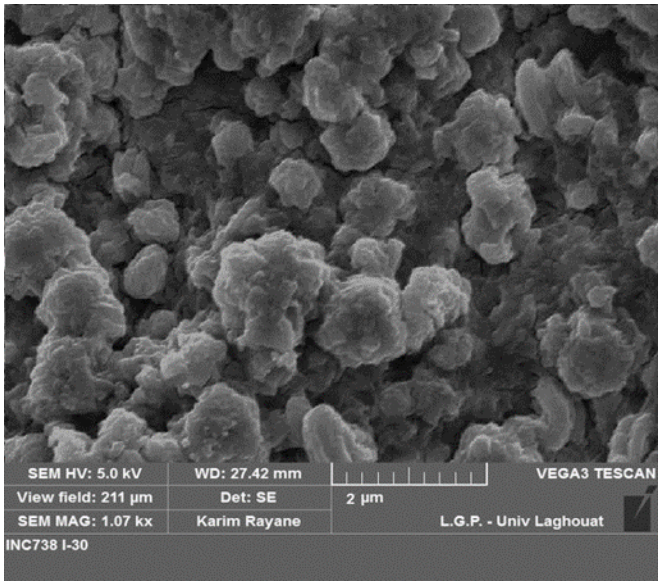
Abstract

Application of chitosan-based materials as adsorbent for the treatment of wastewater has attracted considerable attention in recent years. The main objective of the present work is to formulate and characterize a new generation of adsorbent supports in the form of gelllified porous beads made of chitosan nanoparticles, bentonite and alginate. In this work, three steps were performed: first the preparation of chitosan by deacetylation of chitin extracted from shrimp shells after deproteinization and demineralization. The degree of deacetylation of chitosan is 85.49%. Thereafter, the chitosan nanoparticles were prepared based on pure chitosan and modified by ion tripolyphosphate. These have been encapsulated by a mixture of bentonite and alginate. All the products obtained were characterized by: infrared spectroscopy (FTIR), X-ray diffraction (XRD), thermogravimetric analysis (TGA), dynamic light scattering (DLS), scanning electron microscope (SEM). A set of parameters such as pH, contact time, metal concentration, mass of the adsorbent have been studied to optimize the adsorption capacity of this new generation of beads using transition metals such as copper in aqueous environment. The estimation of this elimination has been performed using an atomic absorption spectrometry apparatus (AAS).



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Biography

Oumkeltoum Rahmani is a doctoral student in molecular chemistry at Amar Teledji University in Laghouat, Algeria. She is currently interested in the extraction and characterization of chitin and chitosan. She has published a .Her H-index article is e-polymers in De Gruyter.

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Synthesis, structures and magnetic properties of dimeric copper and trimeric cobalt complexes supported by bridging cinnamate and chelating phénantroline

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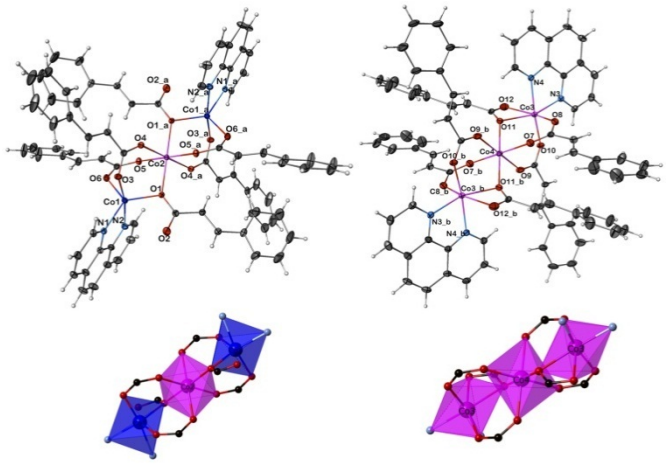
Abstract

The synthetic and structural chemistry of metal– organic frameworks are fast developing areas of research beaming at the rational design of novel materials for potential applications in fields ranging from catalysis, gas storage, separation, and chromatography. Their physical properties, such as magnetism, proton conduction, dielectricity, and optics are also of major interests. One of the basic rules in the synthesis is the use of multitopic organic ligands to connect metal centers through coordination bonds. We present in this poster, two polynuclear transition-metal complexes, $[Co^{II}_3(cinna)_6(phen)_2]$ **(1)**, $[Cu^{II}_2(cinna)_2(phen)_2(NO_3)(H_2O)].NO_3.CH_3OH$ **(2)**, where cinna = trans-cinnamate, PhCH = $CHCO_2^-$ and phen = 1,10-phenanthroline, have been synthesized and characterized by elemental analyses, infrared spectroscopy, single-crystal X-ray diffraction (XRD) and magnetic measurements. **1** contains two independent geometrical isomers of $[Co^{II}_3(cinna)_6(phen)_2]$, where the cobalt atoms form a linear spine bridged by carboxylate from cinnamate radiating perpendicular to it, the 1,10-phenanthroline chelating the ends. **1** behaves as a paramagnet due to the absence of magnetic exchange between the trimers in the absence of chemical bonds between trimers. **2** contains a positively charged dimer of copper ions bridged to two cinnamate in syn–syn mode with two almost parallel phenanthroline molecules chelating the two copper ions, while a water molecule and one $NO3^-$ coordinate their axial positions. The exchange coupling within the doubly- bridged copper atoms is antiferromagnetic (J = -153(1) K).



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Biography

I supported my doctorate in 2016 at university of frères Mentouri de Constantine, Algeria, my research interests inorganic molecular materials by studying their magnetic properties and correlated their structures with their propertiesI published 3 papers.

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Synthesis, Crystal structure, Spectral studies and Hirshfeld Surface Analysis of p-phenylenediammonium di(hydrogenesulfate)

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Abstract

In the last years, organic–inorganic hybrid salts have attracted more attention because of their interesting features and properties [1]. These materials exhibit remarkable structural diversity which results from various type of non-covalent interactions, such as hydrogen bonding, π-π staking, CH..π Interaction, etc. [2].
The present paper is interested in the structural, theoretical and vibrational (IR and Raman spectra) study of new hybrid salts of p-phenylenediamine. The organic entity in this hybrid compound belongs to the large family of p-phenylenediamine derivatives known by its wide range of properties [3].

Keywords: Synthesis, Vibrational spectra, Crystal structure, Hirshfeld surface analysis, XRD, p-phenylenediamine, Sulfuric acid.

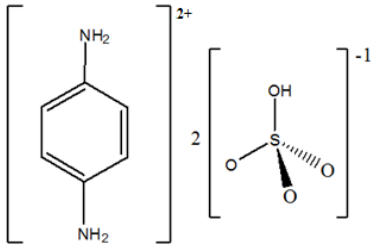

Figure 1: Representative scheme of the salts of p-phenelenediammonium di (hydrogenesulfate)

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Structural and Vibrational spectral investigations of p-phenylenediammonium di(hydrogenesulfate) by FTIR,FT-Raman and Hirshfeld Surface Analysis

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Abstract

The present study is a continuation of our investigations on characterization of phenylenediamine based crystals in the solid state. P-phenylenediamine and its derivatives of organic and inorganic complexes or salts can develop well defined non-covalent supramolecular architectures via multiple hydrogen bonds, since they contain complementary arrays of hydrogen bonding sites [1,2].

The present paper is interested in the structural and Hirschfeld surface analysis study of new hybrid salts of p-phenelenediammonium di(hydrogenesulfate). The intense hydrogen-bonded systems formed in these salts were widely investigated as responsible for structural changes occurred. We also were interested in vibrational spectra for p-pheneylenediammonium di (hydrogenedulfate) crystal among others due to hydrogen bond system present in this crystal. [3]

Keywords: DRX, FT-IR,FT-Raman, p-phenylenediamine, Hirshfeld surface analysis, Sulfuric acid.

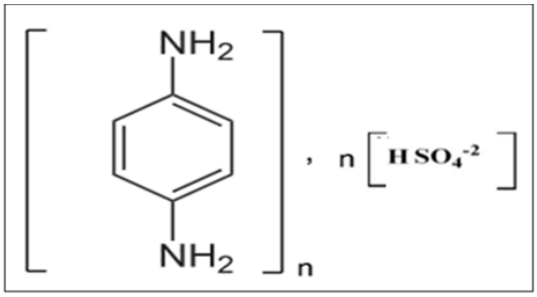

Figure 1: Representative scheme of the salts obtained with derivatives of p-phenelenediamine

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Biography

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Theoretical assessment of static and dynamic polarizabilities of single-walled carbon nanotubes: Semi-empirical PM6 study

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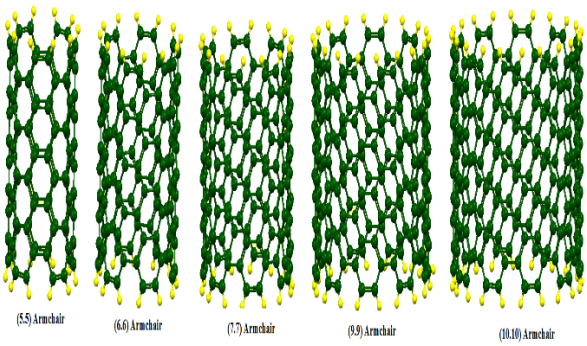
Abstract

Armchair carbon nanotubes (n,n) with n = 5,6,7,9 and 10 saturated with hydrogen at the ends have been studied using semi-empirical PM6 methods. Our results allowed sorting out the considered CNTs by decreasing molecular polarizability value. To understand this phenomenon in the context of molecular orbital picture, we examined the molecular HOMOs and molecular LUMOs energies. An excellent agreement between the PM6 polarizability value and the number of carbon atoms in armchair-CNTs, they give a correlation coefficient of 0.99. The study revealed that the Armchair carbon nanotubes had large polarizabilities values and hence may have potential applications in the development of non linear optical materials.



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Biography

Mr. N.S.LABIDI was born in 1982 in Khenchela city in Algeria. He received his PhD degree in chemistry on March 2013 from Batna University and the highest academic degree (HDR) specializing Chemistry and molecular modeling on September 2016 from University of Laghouat, Algeria. He research interests include: Modeling the kinetics isomerization of substituted polyacetylene using Semi empirical RM1 , Ab initio and DFT calculations, Modeling and Interpretation of Second-Order Nonlinear Optics for Push–Pull Π-conjugated systems, theoretical assessment of second-order nonlinear optical responses of heptahelicene and heptathiahelicene derivatives, study of polarizabilities of Push-Pull carbon nanotubes. He published 21 papers. His H-index is 4 on Scopus and a research gate score (SG) of 16.65 with an H-index of 6.

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New carboxylate derivatives: correlation between corrosion inhibition efficiency and chemical structure

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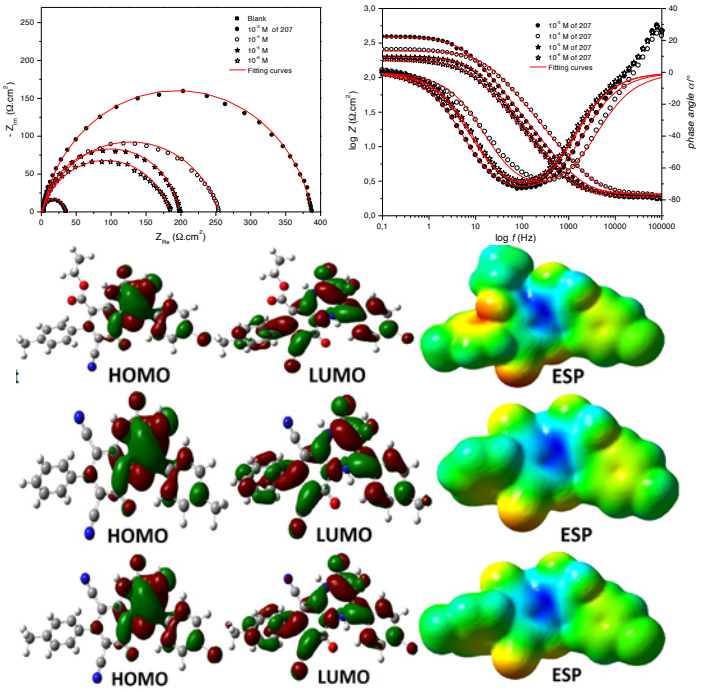
Abstract

Iron and its alloys used in industrial sectors became a major challenge to engineers or scientists in the fight against corrosion [1,5]. Currently, the development of new organic corrosion inhibitors having in their structure: (i) hetero-atoms as oxygen, nitrogen, phosphorus and Sulphur; (ii)π-bonds; (iii)triple bonds (eg. cyano groups); (iv) heterocyclic compounds such as imidazole, quinoline, quinoxaline, phenyltetrazole etc and/or ;(v) functional groups such as =NH, –N=N–, –CHO, –C≡N, etc. [2–4].Hence, new carboxylate derivatives were synthesized for the first time and evaluated as corrosion inhibitors for mild steel in 1.0 M HCl solution.

The evaluation was carried out using electrochemical impedance spectroscopy, polarization curves measurement. It is showed that these compounds are good inhibitors for mild steel corrosion in 1.0 M HCl solution, which are act as mixed type inhibitors. So, the inhibition efficiency was increased with inhibitor concentration in the order P1>P2>P3 which depended on their molecular structures. Electrochemical impedance spectroscopy showed that all compounds act by the formation of a protective film at the metal surface.

The thermodynamic parameters provided the evidence of the inhibitory effect. Langmuir isotherm model fitted well with the adsorption of the inhibitors. Furthermore, spontaneity of the adsorption process, evaluated from the sign of free energy values, showed an increase upon increase in temperature in the presence of inhibitors. The correlation between inhibition efficiency and molecular structure of the inhibitors is investigated by determination of chemical indexes, which were performed using density functional theory (DFT) at (B3LYP/6-31G) (d, p) level. Our experimental findings were in accordance with the theoretical analysis.



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Biography

Mrs. Khaoula Alaoui was born in Morocco. She received his B.Sc. in Chemical Sciences (2013) and M.Sc. degree in Bio-Organic Chemistry and Environment (2015). Then she started to his PhD education in Physical Chemistry (2016), from Ibn Tofail University, Kenitra, Morocco. His main research interests are in the field of corrosion and corrosion inhibition of metals and alloys using chemical and electrochemical techniques and quantum chemical methods (DFT & other semi-empirical methods).She published 2 Book chapter and more than 6 papers. Her H-index is 3 on Scopus.

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Synthesis and application of new hydrazine derivatives H_1 and H_2 as corrosion inhibitors of mild steel in 1.0 M HCl medium: Insight from electrochemical and theoretical studies

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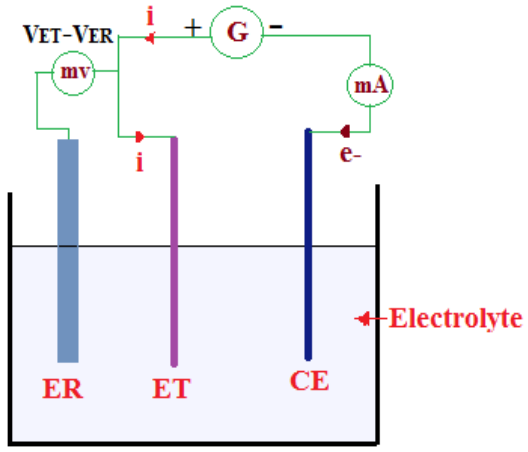
Abstract

In this work, the inhibition effect of synthesized organic inhibitors namely H1 and H2 on the corrosion of mild steel in 1M HCl have been investigated by a series of known techniques such the weight loss measurements, electrochemical impedance spectroscopy, Tafel polarization, density functional theory and molecular dynamics simulations. The obtained results show that compound H1 is a very good inhibitor compared to H2. Generally, the inhibition efficiency increased with the increase of inhibitor concentration. Changes in impedance parameters (Rct and Cdl) were indicative of adsorption of the compound on the metal surface, leading to the formation of a protective film. Tafel polarization measurements showed that the inhibitors are a mixed type. Their adsorption on the surface of carbon steel was found to obey Longmuir's adsorption isotherm.

Further, the quantum chemical calculations based on DFT methods at B3LYP/6-31G** level of theory, were performed using Gaussian 09 set of program. The structural parameters were calculated and discussed. Theoretical results are in accordance with experimental data to the good extent.



Mounting performed to study the electrochemical

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Biography

In order to prevent the undesirable effects of Acid washing used in many industrial fields and to minimize excessive metal corrosion, corrosion inhibitor addition was the most convenient and cost-effective approach to improve the corrosion phenomenon. The author analyzed the anti-corrosive efficiency of two organic compounds in acid meduim by several methods. She is a third year PhD student in the laboratory of Materials and Environment Engineering (LGME) Faculty of Sciences, Fez, Morocco.

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Corrosion and Tribological Properties of Electroless Ni-P-CNF Nanocomposite Coatings

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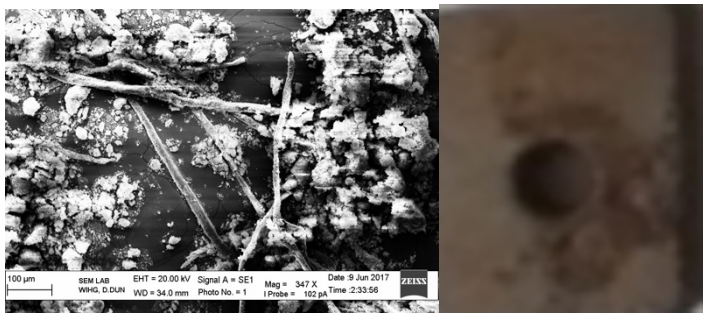
Abstract

In the current experimental work, the electroless Ni-P-CNF nano-composite plating has been deposited upon basic mild steel (AISI 1040) substrate. The 5 gpl activated CNF nano-particles were incorporated into an acidic electroless Ni-P matrix as a second phase material and were condensed by a reducing agent named as sodium hypophosphite. After coating, as-prepared Ni-P/ Ni-P-CNF EL deposition were heated at 400 °C in Ar environment for one hour duration and were analyzed for surface morphology and elemental composition by SEM and EDAX/XRD. The XRD/SEM examinations illustrate that EL Ni-P-CNF (As-plated) depositions have amorphous nature; while EL Ni-P-CNF (Heated) materials demonstrate decline in amorphous nature and enrichment in crystallization nature. These transformations propose to elevate hardness plus wear resistance in coated heated coupons. The heated Ni-P-CNF EL depositions depict less corrosion resistance in compare to as-plated coupons; even though it is improved than MS and SS316L coupons. Consequently heated depositions can be recommended for application in cases where obligation is for enhanced triobological qualities along with not so corrosive environment. Among all materials, a comparison of overall material performance against corrosion attack indicates that the electroless Ni-P-CNF composite coatings demonstrate better corrosion, hardness and wear resistance as against to conventional steel/ Ni-P EL coatings.

Figure: SEM image of Heated Ni-P-CNF coated coupon and (b) Ni-P-CNF As-coated coupon after 6 month exposure in Peroxide Solution.



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Biography

The Main Authors have expertise in Electrochemistry and Corrosion Science. The main focus is based on the preparation of new and innovative nano-composite coatings and their applications in many sectors. Authors were awarded their PhD in 2006 and 2007 from the IIT Roorkee, India. The Authors have published more than 25 research papers.

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New derivative of 2-mercaptobenzimidazole as Corrosion Inhibitors of Carbon Steel in Hydrochloridric Acid Media: Electrochemical, PZCand Monte Carlo simulations studies

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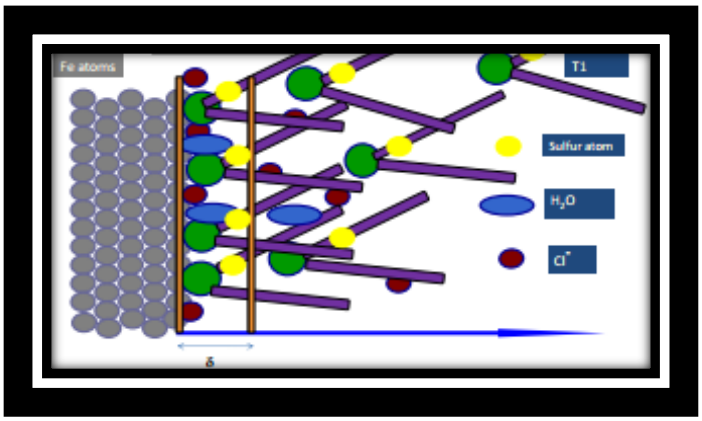
Abstract

In this work, we have synthesized a new compound derivative of 2-mercaptobenzimidazole susceptive to present interesting surfactant properties. We have shown that the compound present a good inhibition properties for the corrosion of carbon steel in (1M) HCl solution; Polarization curves indicated that the inhibitor behave mainly as mixed-type inhibitor. EIS showed that the charge transfer controls the corrosion process in the uninhibited and inhibited solutions. Different inhibition mechanisms were proposed for T1 molecules, based on their The potential of zero charge value in studied conditions. The adsorption of T1 followed El-Awady's kinetic-thermodynamic model. Dynamic simulation agrees the displacement of water molecules by the organic inhibitor.

Keywords: 2-mercaptobenzimidazole, hydrocarbon chains, carbon steel, corrosion inhibition, hydrochloric acid,Monte Carlo simulation,PZC.



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[2] Imane Merimi, Yasser El Ouadi, Kashif Rahmani Ansari, Hassan Oudda, Belkheir Hammouti, Mumtaz Ahmad Quraishi,,Fawzia Faleh Al-blewi, Nadjet Rezki, Mohamed Reda Aouad and MousslimMessali.

Biography

Author has his expertise in evaluation and passion in the use of inhibitors to protect metals against corrosion especially in acidic medium. Its goal is based on the use of its organic molecules to have applications in industries. She is a PhD student in the third year at the Laboratory of Separation Processes, Ibn Tofail University, Faculty of Sciences, Kenitra, Morocco.

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Structural, spectroscopic, and dielectric study of $SmFe_{0.5}Cr_{0.5}O_3$ perovskite

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Abstract

The understanding of functional rare-earth compounds represents a very active research area with relevance to both fundamental and application-related issues, because of their special optical, magnetic and structural properties. Among these functional materials, the Fe-doped rare-earth (RE) chromites with a Fe/Cr=1:1 composition $REFe_{0.5}Cr_{0.5}O_3$, which have been widely studied in the last few years [1] [2] [3] [4] [5] due to the interesting electrical and magnetic properties that they prove.

The perovskite $SmFe_{0.5}Cr_{0.5}O_3$ (referred to SFCO) was synthesized by conventional solid state reaction (SSR) method. The characterization of this compound was carried out by using X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FT-IR), field-emission scanning electron microscopy (FESEM), EDS elemental analysis, differential scanning calorimetry (DSC), dielectric measurements, and impedance spectroscopy (IS). The XRD data showed that the SFCO crystallizes in a Pbnm orthorhombic distorted perovskite structure. The homogeneity and composition of the sample were affirmed by the by FESEM images and EDS analysis. The infrared spectra highlighted a set of absorption peaks corresponding to the stretching and bending vibrations of bands binding respectively iron and chromium with oxygen. Dielectric properties of SFCO were investigated in a wide frequency and temperature range. The evolution of ε' and tanδ with frequency illustrated the relaxation phenomenon, while their evolution as a function of temperature revealed a ferroelectric-paraelectric transition occurring in the material. It was also observed that the compound becomes conductor at high temperatures. The temperature dependence of the ionic conductivity was also discussed and the activation energies were calculated. The fitted Impedance spectroscopy data revealed that both grain and grain boundary contribute in the electric conductivity of the SFCO perovskite.

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Biography

Boudad Lahcen is a second yeas PhD student, his research focuses on physico-chemical study of inorganic materials and particularly the rare-earth perovskites.

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Structural, spectroscopic and magnetic investigation of crystallized glasses $Na_2Pb_{1-x}CuxP_2O_7$

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[2] E2M LCCA, Faculté des Sciences, Université ChouaibDoukkali El Jadiada, Morocco.
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Abstract

The phosphate materials have been extensively studied owing to their wide applications in catalysts, solid electrolytes for batteries, linear and non-linear optical components, electronic device, piezoelectric, solid state lasers, ceramics and magnetic materials. The phosphate compound, in particular the pyrophosphate forms, are not widely studied. In this work we have elaborated the $Na_2Pb_{1-x}Cu_xP_2O_7$crystals,with a large range of composition ($0 \leq x \leq 1$), by annealing the synthesized corresponding glassesin the temperature range 600 – 700°C. The structure of the crystallized compound was characterized and investigated by X-Ray Diffraction and IR spectroscopy. The magnetic measurements were investigated in order to determine the magnetic behaviour of these materials as a function of applied magnetic field and temperature. The network structure of the crystals was drastically influenced by the copper content.

Palladium-catalyzed direct arylation using free NH_2 substituted thiophene and pyrazole derivatives

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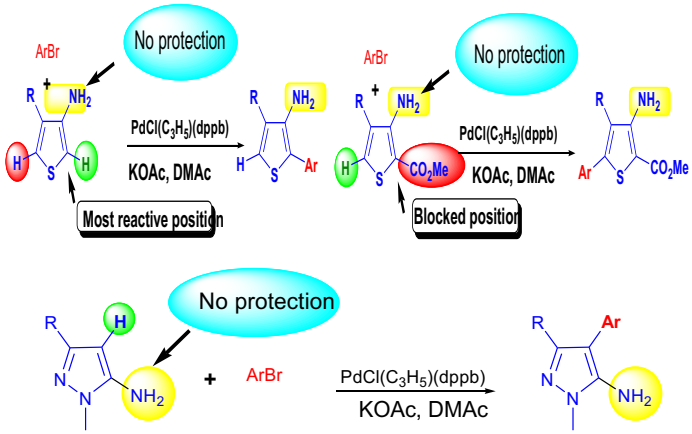
Abstract

Heteroarenes bearing aryl substituents display important biological or physical properties and their preparation represents an important field of research in organic chemistry.[1] In recent years, the palladium-catalyzed direct arylation of heteroaromatics has emerged as a very powerful tool for the preparation of arylated heteroaromatics. [2]

However, there are still important limitations in terms of heteroaromatics functional group tolerance for this coupling procedure. Direct arylations of thiophenes substituted by nitrile, carbonyl, ester, methylalcohol… as the functional groups have been described.[2] On the other hand, the use of heteroaromatics bearing free NH_2 substituents has attracted much less attention. In a few cases, protected amines have been employed.

However, the direct use of heteroaromatics bearing unprotected functions, such as NH_2, would be more useful in organic synthesis since it would allow us to avoid the protection/deprotection sequence and would provide a more environmentally and economically attractive access to such arylated heteroaromatics[3,4].



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Biography

Author has expertise in the synthesis of ligands by homogeneous catalysis and their complexation by transition metals and their application.She is a senior lecturer at the University Mouloud Mammeri of Tizi Ouzou Algeria, she published fifteen papers.

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Notes/Comments

We are grateful to ‘‘University Mouloud Mammeri Tizi Ouzou ” for providing financial support. We also thank CNRS and ‘‘Rennes Metropole” for its welcome and the realization of the work.

Pyrazole derivatives with N-pivot functionalized donor-group. Synthesis and preliminary metals binding properties.

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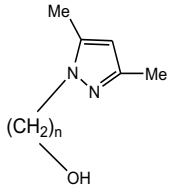
Abstract

The synthesis of pyrazoles ligands with N-pivot side-arm bearing a functionalized donor-group is reported. Complexation capabilities of these ligands towards bivalent metals (Hg^{2+}, Cd^{2+}, Pb^{2+}, Cu^{2+}, Zn^{2+}) and alkali metal ions (K^{+}, Na^{+}, Li^{+}) were investigated using liquid-liquid extraction process and compared to the C-pivot pyrazole one (1-5). The percentage limits of extraction were determined by atomic absorption measurements.

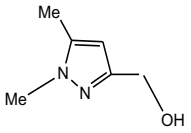
Image: Structure of our pyrazolic ligands.



n = 1 **L1**

n = 2 **L3**

n = 3 **L4**



n = 1 **L2**

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Biography

Author has his expertise in Synthesis and characterization of new compounds based on amino acids grafted on pyrazoles: synthesis and electrochemical applications. She is in her first year of doctorate at the University of Oujda in Morocco. She published two articles on pyrazolic ligands in 2007.

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Inhibition of the corrosion of steel in 1 M HCl by eugenol derivatives

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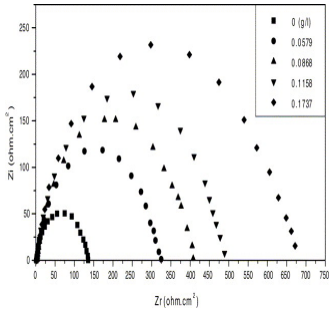
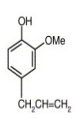
Abstract

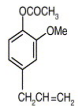
The effect of eugenol (Eug) and its derivative acetyleugenol (AcEug) extracted from the nail of giroflier on the corrosion of steel in molar hydrochloric acid has been studied using weight loss measurements, electrochemical polarisation and EIS methods. The naturally substances reduce the corrosion rate. The inhibition efficiency was found to increase with acetyleugenol content to attain 91% at 0.1737 g/l. Eugenol compounds act as mixed type inhibitors. The effect of temperature on the corrosion behaviour of steel indicates that inhibition efficiency of the natural substance increases with the rise of temperature. The adsorption of natural product on the steel is found to follow the Langmuir adsorption isotherm.

Figure





Eugenol (Eug)



Acetyl-eugenol (Ac.Eug)

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New organic molecular based on Bis-Dipolar Diphenylamino-Endcapped Oligo Aryl Fluorene application for organic solar cells

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Abstract

In this work, eleven conjugated compounds based on a series of bis-dipolar of the emissive oligoarylfluorenes D-A-D, (2) Ar-type NPh, have been studied using quantum chemical methods. The analysis of electronic, structural and photovoltaic properties of these molecules has been reported and discussed in this work. Thus, our objective is to elucidate the parameters that influence the effectiveness photovoltaic toward a better explanation of the structure-property relationships. The results of the calculations show that these compounds can be used as donors of electrons in organic solar cells (heterojunction BHJ), thanks to their optical and electronic properties.

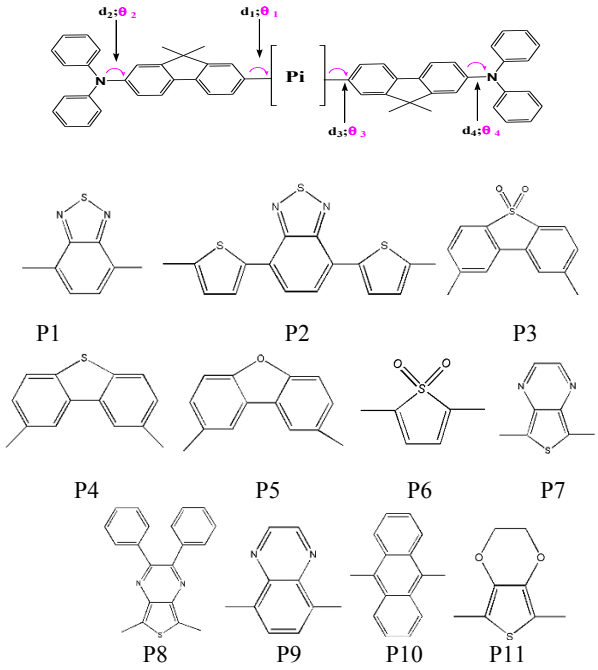

Fig. 1: Chemical structure of studied compounds Pi (1-11).

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Biography

Rchid Kacimi has expertise in the study of molecular materials of various structures based on pi-conjugated systems for applications in organic electronics. PhD student in Chemistry, Moulay Ismail University, Faculty of Sciences, Meknes, Morocco. He has published two articles in two international journals.

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AN EFFICIENT AND SELECTIVE N1-ALKYLATION OF PYRIMIDINES

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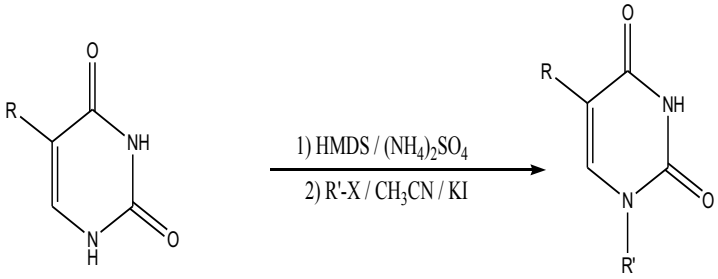
Abstract

The N-alkylation of pyrimidines nucleobases (Uracil, Thymine…) is one of the most studied reactions during recent years. Compounds containing pyrimidines are important class of heterocycles that display a range of significant biological properties, including functioning asanti VZV [1], antitumor [2] and anti HIV [3].The synthesis of these drugs goes through selective N1-alkylation reaction of nucleobases. Although, the various eligible methods include the use of protecting groups as 9-fluorenyl-methoxycarbonyl for the N3 of pyrimidine nuclebases, followed by N1-alkylation and finally N-3 deprotection. Moreover, basic medium as NaH, K2CO3 [2] were used. However, many of these methods have limited by some drawbacks, such as low yields, tedious work-up procedures. The second method is using silylation of pyrimidines by hexamethyldisilazanes (HMDS), then 2,4-bis(trimethylsiloxy)pyrimidine is distilled (harshed work up) and the alkyl halide is added in the presence of Lewis acid [3].

In this work, we developed a slightly modified one-pot (two steps) of Hilbert-Johnson reaction without using distillation of HMDS. Compared to the classical reaction conditions, this new approach consistently has the advantage of excellent yields, simple and convenient procedure. In addition, different alkyl halides and pyrimidines were mixed in the presence of HMDS/KI in MeCN, to give various N1-alkylpyrimidines.



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Biography

Author is a PHD student at the university of sciences and technologyMohammedia. His research focuses on the elaboration and characterization of Nano-catalyst and their application in the preparation of new compounds for therapeutics purpose. He was awarded hisMaster's degree in 2015 from the University of sciences Semlalia Marrakesh, Morocco.

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Corrosion inhibition properties of new hydroxyquinoline derivative: Electrochemical, theoretical and Monte Carlo simulation studies

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Abstract

Inhibition of carbon steel corrosion in 1N hydrochloric acid with a new hydroxyquinoline derivative was investigated by polarization (Tafel), electrochemical impedance (EIS), adsorption and computational calculations. The inhibition efficiency, η(%), increased with the increase in concentration inhibitor. The mixed type inhibitor property of this inhibitor molecules was investigated by potentiodynamic polarization studies. Obvious correlations were found between corrosion inhibition efficiency and some quantum chemical parameters. Monte Carlo simulations were applied to search for the most stable configuration and adsorption energy for the interaction of inhibitor on Fe (1 1 0) interface. Calculated results indicated that the difference in inhibition efficiencies between the compound can be clearly explained in terms of frontier molecular orbital theory.

Keywords: Corrosion inhibitor; Carbon steel; EIS; DFT; Fukui; Monte Carlo simulation.

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Effect of the network structure on the swelling and electro-optical properties of acrylate elastomers, in presence of liquid crystal solvents

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Abstract

The swelling study of polymers networks has already been the subject of several reviews and books [1]. Very recently, swollen LCEs with anisotropic solvents have been studied as the most promising material for artificial muscle, actuators, electro-optical and opto-mechanical devices [2-4].

This work concerns the elaboration and the characterization of isotropic and anisotropic networks and the study of their swelling behavior in nematic solvent. These networks were prepared by ultraviolet (UV) irradiation of reactive mixtures including a monomer, a crosslinking agent and a photo-initiator. Poly (n-butylacrylate) networks were prepared using two crosslinkers: 1,6-hexanedioldiacrylate (HDDA) and a mesogenic acrylic acid 6-(4'-(6-acryloyloxy-hexyloxy) bipheny l-4-yl oxy) hexyl ester (AHBH) which contains a mesogenic group showing a nematic isotropic transition (T_{NI}) at 82.7°C [5]. For the anisotropic network we just change the monomer where the (6-(4'-cyanophenyl-4''-phenoxy) hexyl acrylate (6OCBA) was used to obtain the nematic networks.The obtained dry networks were characterized by differential scanning calorimetry (DSC) and immersed in an excess of LC solvent 4-cyano-4'-pentylbiphenyl (5CB) forming polymer gels. Detailed study by polarized optical microscopy (POM) allowed us to determine the swelling degree of the gels and the phase behavior of the solvent inside the polymer matrix in a wide range of temperature.

It was revealed that the poly(nbutylacrylate) network obtained with the nematic crosslinking agent show fluctuations in the region of T_{NI} solvent. In the case of LCs networks the isotropic gel passes to a nemaic shunken state following the organization of the liquid crystals molecules inside the gel. The corresponding phase diagrams were analysed theoretically using a combination of the Flory-Rehner theory of isotropic mixing and the Maïer-Saupe theory of nematic ordering. A good agreement between theory and experiments is noted.

The electro-optical studies of obtained matrix in presence of liquid crystal showed that certain composites present a high transmittance for relatively weak tensions. This tends to confirm the good provision of these systems in the field of the display.

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Biography

Author has her expertise in Preparation and characterization of several kinds of polymers (polyelectrolytes and polymer liquid crystal) , investigation of phase separated dispersions of nano-and micron-sized liquid crystalline domains in polymers (morphology, structure, thermodynamics, kinetics of polymerization/crosslinking and phase separation, experimental and theoretical phase properties, electro-optical behaviour of polymer dispersed liquid crystal PDLCs; chemically crosslinked polymer networks (synthesis, characterization, swelling/deswelling studies); photochemistry of polymers (ultraviolet irradiation, electron beam bombardment, polymerization/crosslinking processes, grafting, ….) She was warded her PhD in 2015 from the University of Tlemcen (Algeria).

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Antioxidant activities of aqueous extract of *Anacyclusclavatus*

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Abstract

Excessive reactive oxygen species generation leading to oxidative stress in the biological system has been implicated in the pathology of several human diseases. Recently, interest has increased considerably in finding naturally occurring antioxidants to replace synthetic ones, which are being restricted due to their potential health risks and toxicity. This study was carried out to determine the phenolic content and the antioxidant activity of aqueous extract of aerial part of *Anacyclusclavatus* using the DPPH free radical, metal chelating, linoleic acid peroxidation and reducing power assays. The total polyphenol, flavonoid and tannin content of the aqueous extract was found to be79,06± 3,24 µg/mg gallic acid equivalent, 16,39 ± 1,38 µg/mg quercetin equivalent and 31,14 ± 2,27 µg/mg tannic acid equivalent, respectively. The aqueous extract showed a good free radical scavenging activity with IC_{50} value of 68,98 ± 1,64 µg/ml, while the IC_{50} value of the butylated hydroxyl toluene (BHT), used as standard antioxidant was 44.36 ± 3.10 µg/ml. The extract showed a good concentration-dependent chelating activity with IC_{50} of 74,64 ± 11,68. Moreover, the extract at 50 µg/ml inhibited strongly (76%) the linoleic acid peroxidation. Whereas, aqueous extract exerted a strong concentration-dependent reducing power. These results revealed a good antioxidant potential of *Anacyclusclavatus* probably due to its high phenolic contents. Our findings provide evidence that this plant is a potential source of natural antioxidants.

Keywords: Oxidative stress, antioxidant activity, *Anacyclusclavatus,* phenolic content.

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Synthesis of News Molecules of Benzimidazoles

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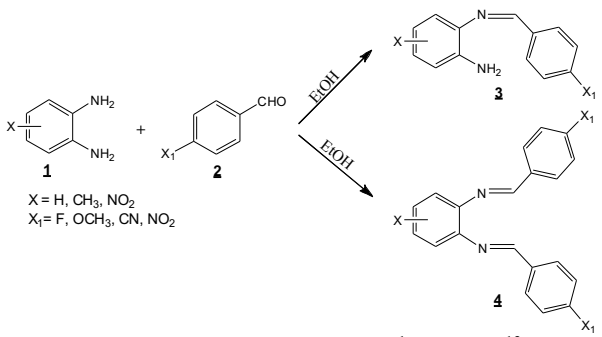
Abstract

Benzimidazoles have interesting pharmacological properties [1-3]. They are widely used as antibacterial, antifugal, antiparasite and anti-viral agents. The reaction of 1,2-Phenylenediamines with aromatic aldehyds allows simultaneous formation of two products [4,5]. In this case, we adopted an operational process which enables us to direct our reaction towards the selective formation of only one product. From these results, we have prepared some news products of benzimidazoles.

Key words: benzimidazolines, Benzimidazoles, 1,2-Phenylenediamines.



All compounds were characterized by H^1 NMR, C^{13} NMR and mass spectrometry.

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New crosslinked calcium alginates material applied forthe removal of ammoniumions from wastewater

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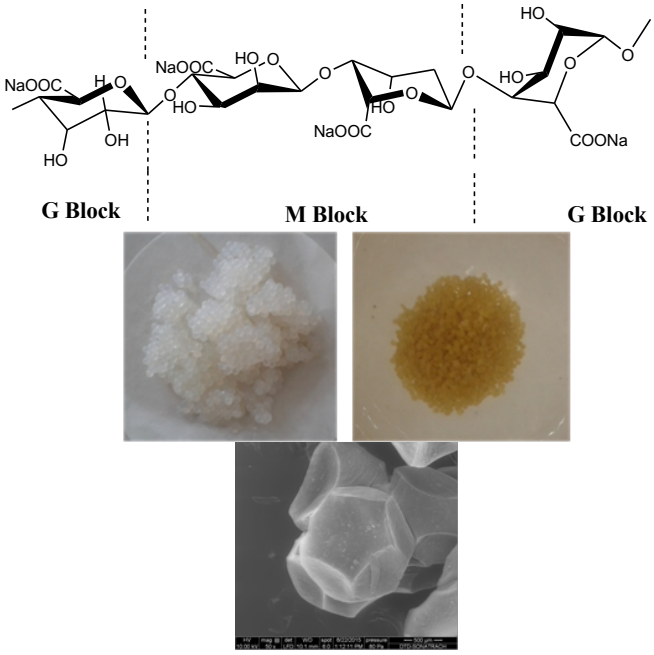
Abstract

Adverse environmental impacts associated to the rich ammonium discharges are undesirable because of their extreme toxicity to most aquatic fauna and human, which also lead to appearance of the eutrophication phenomena[1,2]. A successful adsorption technology depends on the origin, porosity and surface area of the used adsorbent. The best known adsorbents for this treatment are zeolites and its modified forms[3-5]. Recently, polymer hydrogels have been successfully used as adsorbents of ammonium ions. Hydrogels are hydrophilic crosslinked polymer networks in a three-dimensional structure which comprised flexible channels that allow the adsorption of several pollutants. These adsorbents have attracted more attention, because of its high adsorption capacity, speed, easy separation and its wide range of pH applications.

Sodium alginate (Na-Alg) is a binary heteropolymer, which contains varying amounts of 1,4-L-guluronic linked (G block) and BD-mannuronic acid (M block) in a pyranose form arranged to linear blocks (Fig. 1).[6-8]

In this work, sodium alginate solution was crosslinked by calcium divalentcations in the beads forms.The resulting beads were characterized by several techniques and applied as adsorbents in the treatment of ammoniumions. Indeed, optimization of the contact time, temperature, pH, initial adsorbate concentration and initial adsorbent concentration revealed that the best performance was marked at this operational conditions; pH7, T 30°C, C_{NH4+} =10 mg-NH_4^+/L and C_{beads}=4g/Lso, calcium alginate beads were able to remove 69.54% after 60 minutes of stirring. In the other hand, the modelling of experimental data suggested that the ammonium adsorption reactionis obeyed to the pseudo second order model. However, the intra-particle diffusion modelis not the limiting mechanism process.

Figure



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Biography

The author ANGAR Yassmina has 30 years old,is a doctor in chemistry and environment she got her PhD in 2016 at the University of Boumerdes of Algeria, she has a good expertise and a good evaluation methodology. the author has contributed to several national and international conferences and has published 9 scientific articles in well-known and indexed journals. now the author works as a teacher researcher at the University of Boumerdes of Algeria.

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Impact of Shear Lag on interfacial stresses of metallically beam reinforced by FRP composite plate

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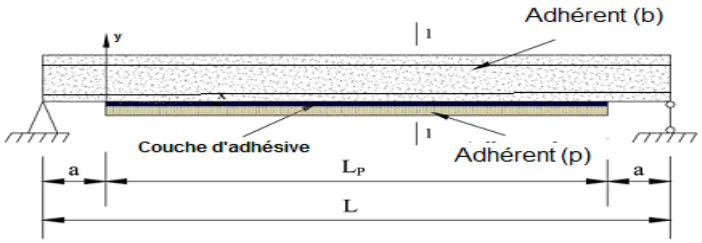
Abstract

Numerical illustrations show that *A.S Bouchikhi and al. (Material and Design 31 (2010) 1508–1515. Elsevier 2009)* analysis can predict interfacial stresses of reinforced beam with tapered plate with sufficient accuracy in most cases, but when the beam is rather short or a very thin adhesive layer or a high modulus adhesive agent is used in a CFRP or steel plated concrete beam, they may lead to solutions with a significant error because of the neglect of shear deformation effect.

A simple closed-form solution to calculate the interfacial stresses of retrofitted steel beams strengthened with FRP plates under thermal and mechanical loads inclining shear lag effect of adherends has been presented in this paperA parametric study is carried out to give information on the contribution of shear deformations on shear stresses by examining the relative difference defined as the percentage of the difference between the two solutions without and with consideration the shear deformation on the stresses interfaces



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Biography

In our study we will make a comparison between two different analytical solutions with and without including the shear deformations of adherents and present the impact of this deformations on distribution of interfacial stress .

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IMPROVING THE ECONOMIC AND PHYSICO-MECHANICAL PROPERTIES OF CEMENT BY USING THE MILLING AGENTS

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Abstract

The energy consumption of the cement mill is of the order of 70 to 80% of the total energy required for the cement manufacture. To reduce this consumption, cement manufacturers use milling agents during grinding. These adjuvants are the products that increase the grinding efficiency when are added to the clinker in small amounts (0.01 to 0.3%). In particular, they make it possible to increase production, to improve the fineness of the cement and to reduce the duration and the grinding energy. In this context, the objectives of our study are:

- Optimize the flow rate of these grinding agents for CPJ_{35} cement
- Determine the effect of grinding agent on the grinding time, energy consumption of the cement grinding process and on the balls coating.

The cements manufactured are milled with the grinding agents according to the combinations proposed by the experimental design used. For the results comparison, milled cements without milling agent will be the references. The results were processed by the statistical software "NemrodW".

Figure: Grinding agent effect of on the balls coating of the cement mill

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Biography

NourElHouda MTARFI has her expertise in improvement of the cement quality and evaluation of the cement additions effects. Her focus is based on the use of fly ash and milling agent to have application in cement field. She was awarded his PhD in 2018 from University of Sidi Mohamed Ben Abdellah, Fez, Morocco. She published 11 papers.

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DFT and experimental studies on the inhibition potentials of ethyl 7-cyano-2,6-dioxo-3,8-di-p-tolyl-2,3,4,6-tetrahydro-1H-pyrido[1,2-b][1,2,4]triazine-9-carboxylate on carbon steel corrosion in hydrochloric acid

A. Lachiri[1], A. Elyaktini[1], M. Zertoubi[1], M. Azzi[1], Z. Benzekri[2], H. Serrar[2], S. Boukhris[2], H. Zarrok[3], A. Zarrouk[4]

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Abstract

The effectiveness of ethyl 7-cyano-2,6-dioxo-3,8-di-p-tolyl-2,3,4,6-tetrahydro-1H-pyrido[1,2-b][1,2,4]triazine-9-carboxylate as a corrosion inhibitor for carbon steel in 1 M HCl solution was tested by electrochemical impedance spectroscopy (EIS), potentiodynamic polarization (PDP) and density functionaltheory (DFT) methods. Polarization measurements revealed the mixed type inhibitor character. The inhibiting action of these molecules is discussed in terms of blocking the electrode surface by the adsorption of inhibitor molecules obeying Langmuir isotherm. The DFT calculations were used to evaluate the electronic parameters of the neutral and protonated forms of this inhibitor.

Keywords: Corrosion inhibition, Carbon steel, Electrochemical impedance spectroscopy, Potentiodynamic polarization, Adsorption DFT.

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Corrosion inhibition studies of new triazine derivative on steel in 1 HCl solution acid

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Abstract

The inhibition efficiency of new triazine derivative against carbon steel on has been investigated in 1 M HCl solution by using electrochemical techniques and quantum chemical calculations. The electrochemical measurements indicate that the inhibition efficiencies increase with the increasing concentration of this inhibitor. According to polarization measurements triazine derivative retards both anodic and cathodic reactions. Electrochemical impedance spectroscopy study proved that triazine could adsorb on carbon steel surface and impart high charge-transfer resistance. Furthermore, quantum chemical parameters of this compound have been calculated to explain the corrosion inhibition mechanism.

Keywords: HCl, Carbon steel, Electrochemical techniques, Quantum chemical calculations.

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INVESTIGATION OF NEW ISONICOTINOHYDRAZIDE DERIVATIVES AS CORROSION INHIBITORS FOR CARBON STEEL IN ACIDIC MEDIUM: ELECTROCHEMICAL, DFT AND MONTE CARLO SIMULATION STUDIES

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Abstract

In the present paper, the inhibitive performance of two newly synthesized isonicotinohydrazide derivatives namely (E)-N'-(3,4-dihydroxybenzylidene)isonicotinohydrazide and (E)-N'-((1H-indol-3-yl)methylene)isonicotinohydrazide as corrosion inhibitors for carbon steel in 1 M HCl was examined using weight loss, Tafel polarization and electrochemical impedance spectroscopy (EIS). Quantum chemical calculations were also conducted to corroborate experimental findings. The results of electrochemical measurements show that the tested compounds are mixed type inhibitor following Langmuir adsorption isotherm and reveal an increase in polarization resistance. Generally, inhibition efficiency of the investigated compounds was found to depend on the concentration and the nature of the inhibitor. Results obtained from various techniques reveal that these compounds are good inhibitors. The inhibition efficiencies given by (E)-N'-((1H-indol-3-yl)methylene) isonicotinohydrazide and (E)-N'-(3,4-dihydroxybenzylidene) isonicotinohydrazide at $5x10^{-3}$ mol/L are 96.5% and 93.14% respectively. The inhibition property was further elucidated by theoretical approaches; quantum chemical calculation (DFT) and Molecular Dynamic (MD) simulation.

Keywords: Corrosion inhibition; Isonicotinohydrazide; Carbon steel; EIS; Quantum chemical calculation; Molecular Dynamic (MD) simulation.

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Decolorization of acidol red 2BE-NW dye in aqueous solutions using CMC-prepared nanoscale zero-valent iron

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Abstract

This study reports a new strategy for stabilizing iron (Fe) nanoparticles .This study demonstrated that carboxymethylcellulose (CMC) can be used for effective stabilization of zerovalent iron nanoparticuls (nZVI) .A systematic characterization of CMC-nZVI was performed using FTIR , XRD and SEM studies . This material is prepared in order to apply it to the retention of the anionic dye contained in the wastewater. The test results shows that we have decolorisation efficiency of around of 95% using CMC-nZVI.These promising results obviously demonstrate the potential of the prepared material for effectively decolorizing dyes in aqueous solutions.

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Biography

Our team is interested in the preparation of several biopolymers composite, and also studied their structure and its morphology by different techniques such as (FTIR, DRX, and SEM). For the purpose of the applied in the environmental field (water treatment against dyes) and in the antibacterial field. I am enrolled in 5th year PhD and I metise different method of characterization (such as FTIR and DRX and spectrophotomere, HPLC) and different software (excel, ppt, endnote).

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Kinetics and thermodynamic studies of adsorption process of methylene blue using PANI/SiO_2nanocomposite

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Abstract

Conducting Polymeric nanocomposites have attracted great attention over the last years because of their potential uses as chemical sensors, electronic and optical devices, and as catalysts as well as in adsorption processes. For adsorption applications, in particular, small and well dispersed nanoparticles are desired. We report in this work chemical synthesis of SiO_2-polyaniline (PANI)nanocomposite and their adsorptive performance in different mediums. In the present work, a polyaniline/SiO_2 composite was prepared and evaluated for its methylene blue (MB) dye adsorption characteristics from aqueous solution. We have synthesized PANI with hydrochloric acid as dopant and ammonium peroxodisulfate (APS) as an oxidant agent. Adsorption equilibrium kinetic and thermodynamic experiments of MB onto PANI/SiO_2 were studied with two different pH values. The effects of solution pH, initial dye concentration, contact time and temperature on the adsorption capacity of PANI/SiO_2 for MB have been investigated. The pseudo-first order and pseudo-second order kinetic models were used to describe the kinetic data. It was found that adsorption kinetics followed the pseudo-second order kinetic model at all of the studied temperatures. The Langmuir, Freundlich and DubininRaduschkevichadsorption models were used for the mathematical description of adsorption equilibrium data and the fit obtained using the DubininRaduschkevich isotherm has an R^2 value of 0.73. The properties of the synthesized polyaniline were investigated by FTIR analysis, differential scanning calotimetry (DSC), thermogravimetry (TGA) and X-ray diffraction (XRD).

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Biography

Author has his expertise in Synthesis of novel adsorbents based on conducting polymers (especially polyaniline). Hisfocus is based on the use of different adsorbents in the purification of polluted water. He was awarded hisMagister'sdegree in 2008 from the University of Ferhat ABBAS of Setif, Algeria. He published more than 3 papers.

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Synthesis, crystal structureand magnetic properties of bis(*N*,*N*-dimethylformamide)tetra(μ_2-thiopheneacetato-O,O')-dicopper(II)

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Abstract

Complexes containing two or more metal ions are of considerable interest not only because they offer high aesthetics in their structures but mainly because they offer new patterns in reactivity, magnetic exchange phenomena and the transfer of energy between their centers.

One dimeric copper carboxylate of formula *[Cu (taa)$_2$(dmf)]$_2$*(where taa denotes 2-thiopheneacetate anion) have been synthesized, structurally characterized, and his magnetic properties have been studied.The crystal structure of the complex belongs to monoclinic system with space group P2(1)/c, it consists of centrosymmetric dimers where the bidentate 2-thiopheneacetate anions form *syn, syn* bridges between copper (II) ions.The coordination polyhedron of each metal ion is completed by the dmf molecule, with a Cu … Cu distance of 2.632(6) Å.

The variable temperature magnetic susceptibilities of the complex have been measured in the range 2 – 400 K under external fields of 0.1T. The $X_mT$product at room temperature is close to the expected one for two isolated Cu(II) with S=1/2, when the T is lowered, $X_mT$decreases indicating the presence of a strong antiferromagnetic coupling between neighboring Cu(II) centers. The model leads to the following values, g(Landé factor) = 2.240, J(exchange coupling) = -321 cm^{-1}.

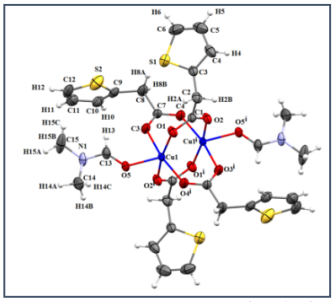

Fig1: molecular structure of *[Cu (taa)$_2$(dmf)]$_2$ dimer*

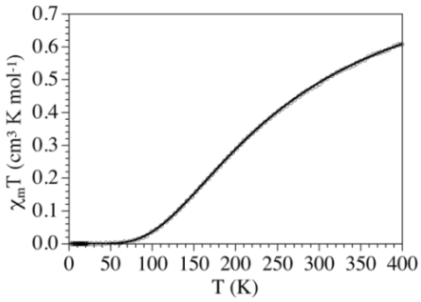

Fig2: $X_mT$as a function of temperature measured in field of 0.1 T

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Biography

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Effects of extraction solvents on phenolic contents and antioxidant activities of five date cultivars growing in Algeria

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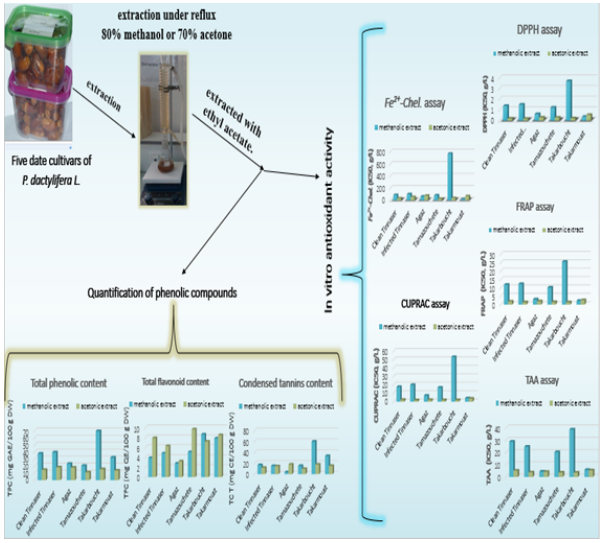
Abstract

Phenolic contents and antioxidant activities of five Algerian date cultivars were investigated using tow systems of organic-aqueous extraction solvents. The highest level of total phenolic contents and condensed tannins were found in 80% methanol extracts. This level ranged from 20.38-69.85 mg GAE/100 g DW and between 3.58-60.05 mg CE/100 g DW. The highest flavonoids were found in acetonic extracts. Antioxidant activities were evaluated in vitro using DPPH, FRAP, TAA, Fe^{2+}-*Chel.* and CUPRAC. The cultivars exerted different antioxidant activities and they were influenced by the extraction solvent. Although they have low phenolic contents, 70% acetone extracts gave highest antioxidant activities. 80% methanol extracts showed high phenolic contents but low antioxidant activities. This study showed that all cultivars in force are a good source of antioxidants.



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Biography

This work devised to investigate the phenolic contents and antioxidant capacities of date cultivars (specific to Ain Salah region in south Algeria) using tow systems of aqueous extraction solvents, 80% methanol and 70% acetone.

The idea originates from the general impact of extraction solvents on the phenolic contents and antioxidant capacities of date cultivars in order to choose the best solvent to run such investigation on date, since this latest is a good source of vital nutrients and antioxidant. For the first time Cupric Ion Reducing Antioxidant Capacity is used to evaluate the antioxidant capacity of date. The target research should be of great interest to vision, scientists, researchers, and scholars who are interested in this conference. This work was accepted previously in INTERNATIONAL SEMINAR ON MEDICINAL PLANTS (SIPM – 2018) UNIVERSITE D'EL-OUED, and Séminaire International sur: Phytodiversité et Plantes d'intérêt écologique et économique en Algérie-Inventaire, Conservation et Valorisation - SIPA.ICV17

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Design of covers with capillary barrier effect for protection of mine tailings and landfill sites

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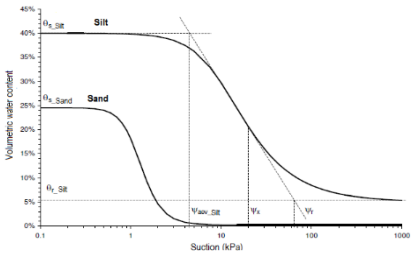
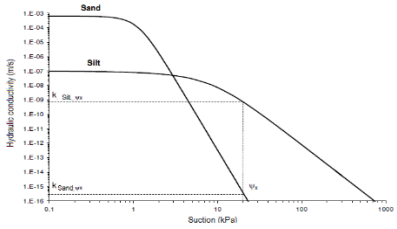
Abstract

The purpose of this work is to design Covers with Capillary Barrier Effect (CCBE) for mine tailings and landfill sites protection. Mining residues in contact with oxygen and water produce sulfuric acid, which is harmful for the environment. Water infiltration through landfills produces leachate, which is loaded with contaminants. The capillary barrier effect is created when a layer of material having the hydraulic properties of a fine soil is installed on a layer of material having the hydraulic properties of a coarse soil. The difference between the geometry and the pore distribution at the interface of the two materials creates, if the CCBC is well designed, a low permeability barrier. In the case of mine tailings, the CCBC causes the accumulation of water in the upper layer and thus limits the diffusion of oxygen which, when it comes into contact with water and mine tailings, produces sulfuric acid. In the case of landfills, the CCBC serves rather as a hydraulic and evapotranspiration barrier, i.e. it controls infiltration and acts as a buffer zone where water is accumulated and then transmitted into the atmosphere through evaporation or transpiration of plants. The behaviour of the CCBC is studied, in order to understand the phenomena of pressures in such recoveries. This study is done through numerical simulations under the designed software. These simulations allowed to analyze the behaviour of CCBCs subjected to long periods of drought and long periods of flooding. The phenomenological knowledge that derives from the numerical study of CCBCs makes it possible to optimize the design parameters, the selection of materials, according to their texture and chemical nature, the thickness and the inclination of the layers. As a conclusion, methodology is proposed to design the CCBC; this methodology requires the use of numerical simulation software for calculating flows in unsaturated porous media.

Key words: covers with capillary barrier effect; oxygen diffusion; water infiltration; mining residues; sulfuric acid, landfill; leachate; numerical simulation.



a) Water retention curves



b) Hydraulic conductivity curves

The CCBE phenomenology can be explained by the water retention curves and the hydraulic conductivity curves of the two materials, sand and silt. Figure a shows that the air entry value (AEV) and the degree of saturation of silt are higher than those of sand. In Figure b, we see that at saturation, the hydraulic conductivity of the silt is less than that of the sand, but that under a higher state of suction (ψ_x), the sand is less permeable than the silt ($k_{Sand_x} < k_{Silt_x}$). This creates a capillary barrier effect.

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Biography

Nacer E. EL KADRI E. received his B. Eng. and Ph. D. degrees in 1990 and 1996, respectively, at Laval University Quebec, Canada. EL KADRI has been professor of Mechanical Engineering at University of Quebec in Abitibi-Témiscamingue, Canada in 1997 and 2000. EL KADRI is professor of physics in Université Sidi Mohamed Ben-Abdellah, Faculté Polydisciplinaire de Taza. Morocco, since 2003. Author and co-author of numerous technical papers, his research interest is computational fluid dynamics.

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Jamil TOYIR, Professor of Chemistry at Faculté Polydisciplinaire Taza- Université Sidi Mohamed Ben Abdellah. has his expertise in development of sustainable processes for energy and environment using catalytic approaches and renewable sources. CO_2 recycling into chemicals and fuels besides hydrogen production, transport and storage are the main author's investigations He was awarded a European Label PhD from the University of Lyon, France. He performed as a long stay invited researcher in several laboratories around the world in France, Japan, and Spain. He published more than 50 papers. His H-index is 14 on Scopus with an average number of citations of 68 per year since 2012. His holding 8 patents.

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Study of diffusion of isotropic solvents into polymer network from swelling measurements

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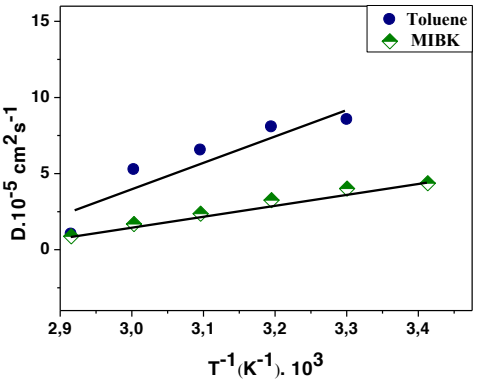
Abstract

The aim of this work is synthesis and characterization by swelling in isotropic solvents at equilibrium of crosslinked poly(PEA) network.Synthesis of photo-chemically polymer networks is carried out by exposing the mixture of compound: photoinitiator (Darocur 1173), the crosslinking agent (HDDA) and the precursor monomer (2-phenoxyethyl acrylate), under UV radiation. Polymer networks obtained are characterized by different physico-chemical techniques (DSC, TGA and FTIR). The swelling behavior of these networks was further investigated in different isotropic solvents and for a different temperature. The coefficient diffusion is calculated. We deduce the relation between the temperature and the diffusion process. The Arrhenius parameters were estimated. The Van't Hoff relationship was used to compute the entropy and enthalpy of sorption, and generally, the sorption process was found endothermic, and spontaneous.



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Biography

The authors Studied physics at the University of Tlemcen (Algeria) where he received his Magister's degree (Diploma) in 2012. Working on the phase behavior of polymer blends, in 2009. she joined the Laboratoire de Recherche sur les Macromolécules of the University of Tlemcen (Algeria). She participated in several symposia and congress.

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Study of synthetics dyes adsorption onto poly(vinyl alcohol)/glutaraldehyde/β-cyclodextrin polymer membranes

Ghemati Djamila, Aliouche Djamel

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Abstract

Among the numerous techniques of dye removal, adsorption on modified polymers is a procedure of choice; due to easy handling and removal efficiency. Polyvinyl alcohol (PVA) is a water-soluble synthetic biopolymer, biodegradable, and non-toxic. However, to improve the functionality of PVA, this polymer is often combined with nanoparticles and other synthetic and natural polymers, such as polyacrylic acid, chitosan, cyclodextrins, and gelatin. In this work, Crosslinked poly(vinyl alcohol)/glutaraldehyde (PVA/GA) membranes were prepared, and attempts to obtain hydrophilic crosslinked PVA membranes were made by adding various amounts of β-cyclodexrin, which is a typical cyclic oligosaccharide able to form inclusion complexes with organic host molecules (host-guest complexes). Thus, membranes of poly (vinyl alcohol)/glutaraldehyde/β-cyclodextrin (PVA/GA/β-CD)were synthesized.

The membranes were characterized by infrared spectroscopy (FTIR) and swelling measurements. The ability of cyclodextrin to include a wide variety of chemicals was also exploited for the dye adsorption to show the potentialities of the membranes in the textile liquid waste processing.

Adsorption of reactive, methyl orange and methylene blue dyes on (PVA/GA/β-CD)membranes was consequently studied using UV-Vis spectroscopy at wavelengths of 547, 463 and 660 nm respectively. Adsorption reached equilibrium after 24 hours.

Results indicated that there is no covalent bond formation between PVA and β-CD; the β-cyclodextrin is completely mixedinto the PVA matrix polymer. The adsorption capacity increase with increasing amount of cyclodextrin; the maximum adsorption capacity was obtained with 8% β-CD. Therefore, change in adsorption capacities may be due to dye structure effect, the negative value of free energy indicated the spontaneous nature of adsorption.

Key words: poly (vinyl alcohol), β-cyclodextrin, dyes, adsorption, swelling.

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Synthesis, crystal structureand magnetic properties of bis(*N*,*N*-dimethylformamide)tetra(μ_2-thiopheneacetato-O,O')-dicopper(II)

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[1] *Universitéd'Alger 1 benyoucef BENKHEDDA, Algeria*
[2] *Université d'Alger 1 benyoucef BENKHEDDA, Algeria*

Abstract

Complexes containing two or more metal ions are of considerable interest not only because they offer high aesthetics in their structures but mainly because they offer new patterns in reactivity, magnetic exchange phenomena and the transfer of energy between their centers.

One dimeric copper carboxylate of formula *[Cu (taa)$_2$(dmf)]$_2$*(where taa denotes 2-thiopheneacetate anion) have been synthesized, structurally characterized, and his magnetic properties have been studied.The crystal structure of the complex belongs to monoclinic system with space group P2(1)/c, it consists of centrosymmetric dimers where the bidentate 2-thiopheneacetate anions form *syn, syn* bridges between copper (II) ions.The coordination polyhedron of each metal ion is completed by the dmf molecule, with a Cu … Cu distance of 2.632(6) Å.

The variable temperature magnetic susceptibilities of the complex have been measured in the range 2 – 400 K under external fields of 0.1T. The $X_mT$product at room temperature is close to the expected one for two isolated Cu(II) with S=1/2, when the T is lowered, $X_mT$decreases indicating the presence of a strong antiferromagnetic coupling between neighboring Cu(II) centers. The model leads to the following values, g(Landé factor) = 2.240, J(exchange coupling) = -321 cm^{-1}.

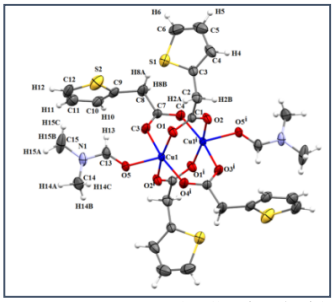

Fig1: molecular structure of *[Cu (taa)$_2$(dmf)]$_2$ dimer*

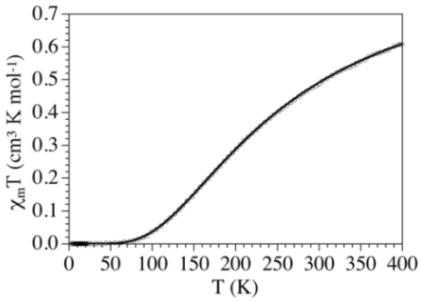

Fig2: $X_mT$as a function of temperature measured in field of 0.1 T

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Biography

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Photocatalytic degradation of pharmaceutical products by decatungstate based photocatalyst

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Abstract

In aqueous solution, the decatungstate shows an important photocatalytic activity under UV radiation (λ>300nm). Rafqah and al were demonstrated the degradation of metsulfuron methyl by decatungstate anion; the degradation rate was 80% of the initial concentration (1.10^{-4} $Mol.L^{-1}$). But homogenous photocatalysis require very specific separation processes of the photocatalyst after degradation of undesirable products, which is not practical or difficult in some cases. To overcome this problematic, heterogeneous photocatalysis remains the effective solution to avoid the separation processes after wastewater treatment.

The purpose of this study is to make the decatungstate insoluble by associating it with surfactants while keeping the same photocatlytic activity. The compound target is the sulfamethzine (SMT), one of the sulfonamide antibiotics. Our first concern is to confirm the degradation of sulfamethzine by decatungstate anion in aqueous solution. And then we will synthesize a new insoluble photocatlyst based on decatungstate with a significant catalytic activity.

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DEVELOPMENT OF MOROCCAN EXPANDERS FOR LEAD-ACID BATTERY FOR STARTING AUTOMOTIVE

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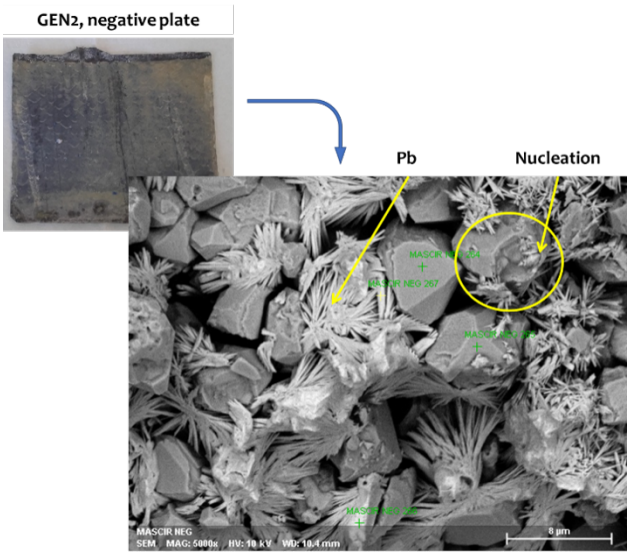
Abstract

Today, several lead acid battery technologies exist, such as valve regulated lead acid battery "VRLA" otherwise called maintenance-free battery, and the absorbent glass matt battery "AGM" with glass fibers, used for to immobilize the electrolyte. Whatever the technology, hard sulfation is one of the most important failure that touches the negative plate.

Sulfation is a chemical process irreversible that leads to the formation of non-conductive lead sulphate ($PbSO_4$) called hard sulfate, which leads to the passivation for electrochemical activity of negative plate. As a result, sulfation becomes the most discussed failure mode in lead–acid batteries [1]. To remedy this inconvenience in the negative paste, the expander is added to prevent the deposition of a continuous lead sulfate passivating layer during battery discharge [2]. Expanders are an essential component of the negative plate of lead-acid batteries. Without them the capacity and life would be significantly impaired [3].

This study aims the development of an expander for the Moroccan manufacturer of battery **ELECTRA BATTERIE**. In addition, it is dedicated to the various experimental tests and characterizations regarding expander, which offers to the Pb-acid battery the better results in terms of load acceptance, load capacity, and the number of charge-discharge cycles, which would automatically extend the life of the battery. The experimental study was carried out on 1.5 Kg of different samples of the expander. Many characterizations were realized particularly the density, the solubility, the rate of ash, thermal resistance and the particle size distribution. Electrical tests were carried out at **Afrique Cable Company** to evaluate the performance of the expanders. Five tests with different batteries were made including the effective capacity, the cold cranking amps 'CCA' and the electric voltage drop after 10 seconds of discharge, and all this according to the standards.



Negative plate, MAScIR GEN2, formed

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Optimization of extraction of polyphenols of citrus peels ionized Moroccan and stored under refrigeration

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Abstract

The extraction of compounds considered as active principles to high value added, from the fruits -in particular the case of polyphenols- of our days, have a lot of interest in several scientific research, due to their effects, beneficial impact on the health, and mainly due to their anti-oxidant properties and anti-radical.

There are different methods of extraction modern which are particularly adapted to the extraction of natural products. We used the extraction assisted by ultrasound (UAE), which is usable with any type of solvent and the interest of never having been used with the citrus peels. For these reasons, the UAE has therefore been chosen to achieve the different series of extraction of the peelings of our samples.

The purpose of our study is to optimize the time of the extraction, the solvent from the extraction and plant material this in relation to the different species of citrus fruit, in relation to the different parts of the fruit, as well as in relation to the form of the zests.

This work has led to optimize the conditions for extraction of polyphenols from the Citrus Zest freeze-dried.

optimum time for a better performance of this extraction is 6h. Ethanol is the better adapted with a concentration water/ethanol (30/70), the Zest contains almost two times more, quantity of polyphenols that in the juice, with respective values of 7.52 mg/g and 3.6 mg/g. The best performance of polyphenols is the one given by the powder of orange.

The phenolic content total is determined colorimetrically with the UV spectrophotometer-visible using the test for Folin-Ciocalteau

The analysis of the extracts obtained from the extraction method studied and that of the standard solutions available employed (narirutine, naringine, hesperidin, and quercetin) is determined by the liquid chromatography high performance (UPLC).

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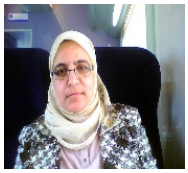
Biography



My research focuses primarily on the analytical chemistry and everything related to the agro-food, in addition to my research work in the field of treatment of the water. I obtained my doctorate in the optimization process for conservation treatment of citrus fruit by irradiation combined with refrigeration, the Laboratory of materials and the recovery of resources, Department of Chemistry, Faculty of Science and Technology, University EssaâdiAbdelmale, Tangier, Morocco.I continued my research work in the same field of the chemical analysis and the agro-food for other foods. I have crowned my work by national and international publications..

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Excitonic properties in an asymmetric quantum dot nanostructure under combined influence of temperature and lateral hydrostatic pressure

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Abstract

Simultaneous effects of temperature and lateral hydrostatic pressure combined to axial asymmetric confinement potential and size effects on the behaviour of the exciton in 0D GaAs/Ga(1-x)Al(x) asymmetric quantum dot nanostructure are investigated. Our calculations are performed in the framework of the effective mass approximation by using a variational method with a robust trial wave function by taking into account the dependence of exciton properties on the QD sizes, the axial asymmetric confinement potential, the temperature and the pressure. Variation of the excitonic binding energy, photoluminescence energy and band gap energy are discussed according to tempurature and hydrostatic pressure for different confinement regimes and various potential wells. Our numerical findings show that the applied pressure favours the attraction between electron and hole while the temperature tends to decrease the exciton binding energy. Furthermore, the photoluminescence energy is decreasing function of the temperature and increasing function of the pressure. The opposing influences caused by temperature and lateral hydrostatic pressure with contribution of variation of axial asymmetric confinement potential reveal a significant practical interest and offer an alternative manner to the tuning of the excitonic transition in optoelectronic devices.

***Keywords*:** Quantum dots, Exciton, Hydrostatic pressure, temperature, Asymmetric potential.

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Experimental and theoretical studies of amino phosphonates as new and effective corrosion inhibitors for carbon steel in 1M HCl solution

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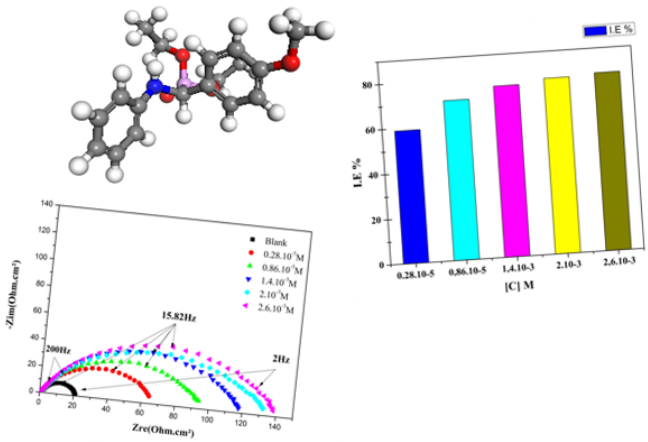
Abstract

Several industrial process use acid solutions in their techniques like acid cleaning, pickling or descaling. These acid solutions create serious metallic corrosion on the metallic surfaces. To reduce this unpleasant phenomenon, corrosion inhibitors are added in the acid solutions. For this purpose, organic compounds containing heteroatoms such as N, O, S, and P, aromatic rings and/or π-electrons are considered as one of the most practical issue to inhibit metallic corrosion.

In this study, the corrosion inhibition effect of our synthesized amino phosphonate (diethyl(4-methylphenyl) -N-(phenyl) aminométhylphosphonate) on the carbon steel has been investigated in aerated 1.0 M HCl solutions. Electrochemical impedance and polarization curves were used at different amino phosphonate concentrations.

The results indicate that the studied compound is an effective inhibitor with anodic type and its efficiency of inhibition increases with concentration. The adsorption of the inhibitor on steel surface has followed the adsorption isotherm of Temkin.

DFT quantum chemical calculations were used to interpret experimental results and to predict the inhibition efficiency for analog molecules.



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A Novel Approach for the Microwave-assisted synthesis of 5-substituted 1H-Tetrazoles

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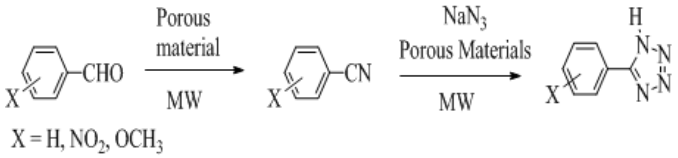
Abstract

Tetrazoles are a class of heterocyclic compounds with a wide range of applications in medicinal chemistry and in material sciences. **R. N. Butler, in Comprehensive Heterocyclic Chemistry II; A. R. Katritzky, C. W. Rees, E. F. V. Scriven, Eds., Pergamon Press: Oxford, Vol. 4, p. 621, 905(1996)**
The conventional method reported for the synthesis of 5-substituted tetrazoles suffer from drawbacks such as the use of strong Lewis acids, or expensive and toxic metals, and the in situ-generated hydrazoic acid, which is highly toxic and explosive. **R. N. Butler, in Comprehensive Heterocyclic Chemistry II; A. R. Katritzky, C. W. Rees, Eds., Pergamon Press: Oxford, Vol. 5, p. 791 (1984).**
Nowadays, more and more heterogeneous Bronsted acids, e.g., zeolites, are preferred from an economical perspective as well as from an ecological viewpoint, due to their high protonic acidity and unique shape-selective behavior.
In continuation of our interest in the development of efficient and environmentally friendly methods for the catalytic synthesis of heterocycles, and the application of heterogeneous reagents for the development of useful synthetic methodologies, the method of synthesis that we will adopt is to prepare these tetrazoles by microwaves irradiation of nitriles using micro and mesoporous materials as catalysts.



Our materials and compounds were characterized by different techniques : (DRX, BET, IR, 1H and 13C NMR).

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Biography

Author ,The work of Mr Hamadouche and his team focuses on the preparation of polyfunctional carbo- and heterocyclic compounds and their use as synthons in synthesis schemes of similar target molecules of natural products. for this, different methods are implemented, namely: the use of new methodologies more respectful of our environment (green chemistry), metathesis reactions (RMC), multicomponent domino reactions allowing access in a single step to new polyfunctional molecules that can be used as molecular scaffolds the substrates used in our work are commercial and easily accessible and respond to a wide range of reactivity. In addition, we strive to exploit the reactivity of widely available natural products. the application of these synthesis methodologies should allow us to access high potential synthetic molecules with very interesting potential application.

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Effect of water hardness on the survival and adhesion of *Legionella pneumophila* to Surfaces

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Abstract

Legionella pneumophila is the causative agent of 90% of Legionnaires' disease. This bacterium lives mainly in hot water systems and can colonize biofilms; that play an important role in protecting *Legionella* against environmental stressors. Some outbreaks of Legionnaires' disease are correlated with the presence of biofilm. The relationship between adhesion of *L. pneumophila* to surfaces and the hardness of water expressed by the calcium and magnesium levels is not well known. The aim of this study was to determine the effect of water hardness on the physicochemical properties of the bacterial surface, the survival and adhesion of *L. pneumophila serogroup1* (Lpn sg1) and *serogroup2-15* (Lpn Sg2- 15) to surfaces. The role of the minerals composition was also investigated. The adhesion of Lpn sg1 and Lpn Sg2-15 to surfaces is favoured by the presence of both minerals (calcium and magnesium). The extent of adhesion is in correlation with the water hardness. The number of adhered cells increases with increasing water hardness. Understanding these mechanisms is essential to find ways not only to prevent biofilm formation and water contamination, but also to minimize the risk of Legionellosis.

Keywords :*Legionella pneumophila,* adhesion, Survive, surfaces, water hardness.

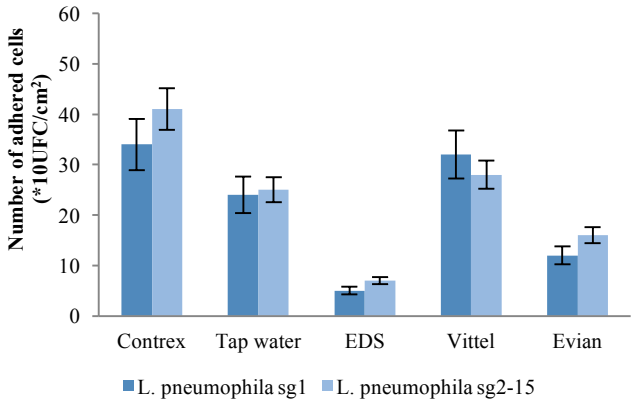

Figure1. Adhesion of *L. pneumophila* Sg1 and Sg2-15 strains to glass at different water

Synthesis and anti-corrosion research of 1-(4-dimethylaminobenzylidene)-2-(2- hydroxybenzylidene) hydrazine

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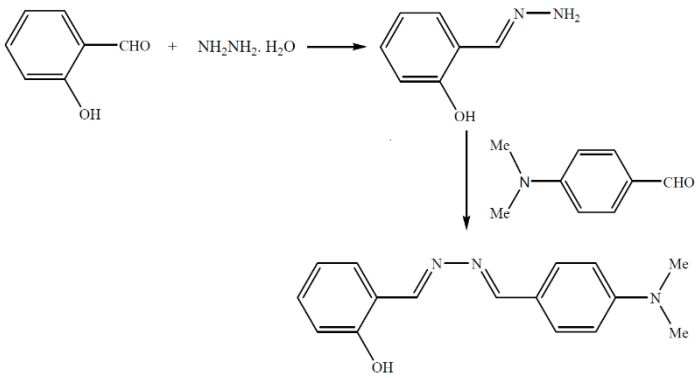
Abstract

The tested inhibitor namely 1-(4-dimethylaminobenzylidene)-2-(2- hydroxybenzylidene) hydrazine (HD) was synthesised in our laboratory according to a previously described experimental procedure [1,2], purified and characterised by 1H NMR, 13C NMR, IR spectroscopies and element analysis before use. The molecular structure of the studied hydrazone is shown in Fig. 1. HD was tested as a corrosion inhibitor for XC38 steel in 1M HCl using weight loss method and potentiodynamic polarization methods. The corrosion inhibition efficiency results obtained by all the both techniques were in good agreement with each other. This study revealed that, the inhibition efficiency increases with increasing the inhibitor concentration The effect of temperature on corrosion inhibition has been studied and activation energy has been calculated. Some thermodynamic parameters are calculated and discussed. The adsorption of this compound on the surface of XC38 steel obeys Frendlich's adsorption isotherm.

Fig 1: Synthesis of 1-(4-dimethylaminobenzylidene)-2-(2-hydroxybenzylidene) hydrazine



Biography

Fellah Amel, Assistant professor of chemistry since 2016, faculty of science, university of Tiziouzou, Algeria.
Her field of research is based on the use of organic inhibitors against corrosion of carbone alloys. She was warded her Magister in 2010 from the University of Tlemcen, Algeria.

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Electroleaching of a zinc ore in the presence of potassium permanganate

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Abstract

Electroleaching is a metal extraction technique that uses the electric field to migrate the leaching agent while raising the redox potential. This technique was developed at USTHB's hydrometallurgical and inorganic molecular chemistry laboratory [1-2]. It reduces the number of unit operations and the consumption of reagents. The idea of implementing this process stems from previous work on electroremediation [3-4] which is based on electrokinetic phenomena.

The work carried out consists in studying the role of the oxidant on the extraction of zinc from an Algerian ore by electroleaching.

Electroleaching can be versatile depending on the nature of the ore and physicochemical phenomena must be explored.

The purpose of this study is to contribute to the understanding of the behavior of reactive chemical species in ore and their transport under the action of an electric field.

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Remediation of Water Contaminated with Organic Pollutants by Moroccan Natural Clay

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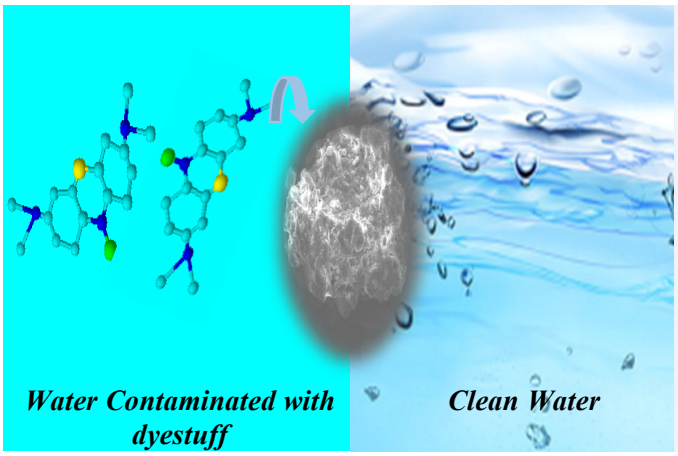
Abstract

In this study, the removal of a cationic dye namely, methylene blue (MB) by natural clay from aqueous solution was investigated. The morphology, structure and surface state of NC were characterized using X-Ray Diffraction (XRD), X-Ray Fluorescence (XRF), Fourier Transform Infrared Spectroscopy (FTIR), Differential Scanning Calorimetry (DSC), Scanning Electron Microscopy (SEM)) and Optical Microscope, respectively. Affecting factors solution pH, dye concentration, contact time and temperature were investigated. The maximum removal was obtained at basic pH. The experimental equilibrium data were examined using Langmuir, Freundlich, Temkin and Dubinin–Radushkevich. The equilibrium data for cationic dye adsorption was fitted to the Langmuir, and the maximum adsorption capacity of natural clay for dyestuff was up to 25 $mg.g^{-1}$. The adsorption kinetic dye was analyzed using pseudo-first order, pseudo-second order, Elovish and the intraparticle diffusion model. The kinetic data of cationic dye could be better described by the pseudo second-order model. The thermodynamic parameters such as the change in free energy (ΔG^o), enthalpy (ΔH^o) and entropy (ΔS^o) of adsorption were determined. These values show that the adsorption was exothermic and spontaneous.

Keywords: Natural clay, Adsorption model, Kinetics, Thermodynamics, Cationic dye.



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Biography

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Antimicrobial activity of some manganese (II) and copper (II) complexes with derivatives benzoxazole ligands

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Abstract

Resistance of bacteria to antimicrobial agents has been known since the earliest development of antimicrobial therapy, but the emergence of strains of bacteria resistant to the common antibacterial agents has become an increasingly great problem in clinical medicine. For these reasons, a synthesis of new chemical products with antimicrobial activity is necessary.

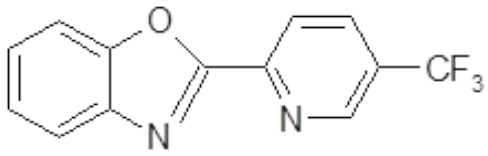
The family of the benzoxazole and its derivatives are ligands of great interest within the area of biological and pharmacological activities involving antibacterial, antifungal and anticancer activities. These mixed ligands possess heteroatoms (N, O) and present an enough rich cavity of electrons which could accept metallic ions.

Based on our earlier research on the activity of transition metal complexes, new derived benzoxazole ligands (Fig. 1) and their transition metal complexes with manganese (II) and copper (II) have been synthesized and characterized.

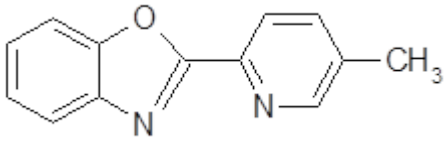
The antimicrobial activity of both ligands and their complexes was experimentally explored.

Also, in order to obtain data on the safety-in-use of these compounds, the acute and subacute oral toxicity in an animal model according to OECD guideline were reported in this paper.

Key words: benzoxazole ligand, complex, metal ions of biological interest, characterization, antibacterial activity, acute and subacute toxicity.



L^1



L^2

Fig.1. Structure of derived benzoxazole ligands; L^1: 2-(4-trifluoropyridin-2-yl)-benzoxazole and L^2: 2-(4-methylpyridin-2-yl)-benzoxazole**.**

Study of the corrosion behavior of reinforcing steel in reinforced concrete elements

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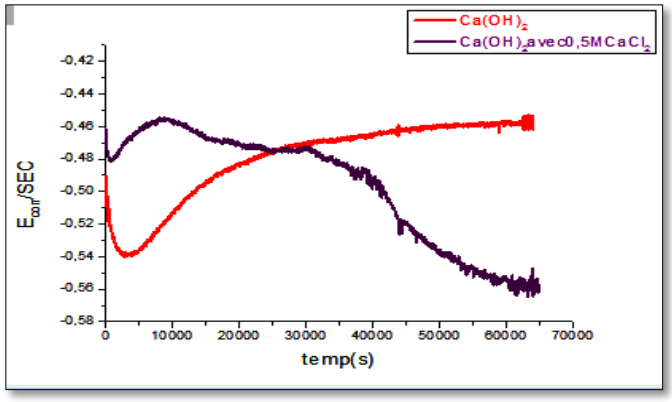
Abstract

Corrosion of steel in reinforcement concrete is complex. When chloride ions and oxygen reach reinforcing steel, corrosion is initiated. The deterioration process starts with expansions of the bare steel substrate thenafter cracks in the concrete are developed. The aim of this work is to determine firstly, through the electrochemical technic, the critical concentration of chloride ions which are responsible for the initiation of the dissolution step. Then, the effect of the external parameters on the rate of penetration of the chloride ions into the concrete are also evaluated. For this propose, the electrochemical bahavior of the steel of construction "E24" is studied in carbonate medium without and with different concentrations of chloride ions. The effetct of various parameters such as temperature, ions concentration and solution pH was also evaluated through the evolution of the open circuit potential, d.c polarisation measurment and electrochemical impedance spectroscopy. The d.c polarisation and EIS results shows that the addition of 0.5M $CaCl_2$ (as critical concentration) to the saturated $Ca(OH)_2$ solution, brings to a rapid and a continuoes dissolution of the susbstrate where after 3 hours of immersion time the whole surface of the susbtarte was covered the corrosion products. This is may be due to specific adsorption of Cl^-. According to Raman, SEM and EDS analyses of the surface after immersion in the corrosive media, the composition of rust layer is mainly composed of γ-FeOOH, β-FeOOH and α-Fe2O3.



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Chemical composition and insecticidal activity of five essential oils: *Citrus limonum*, *Cedrusatlantica*, *Rosmarinus officinalis*, *Syzygiumaromaticum* and *Eucalyptus globules*

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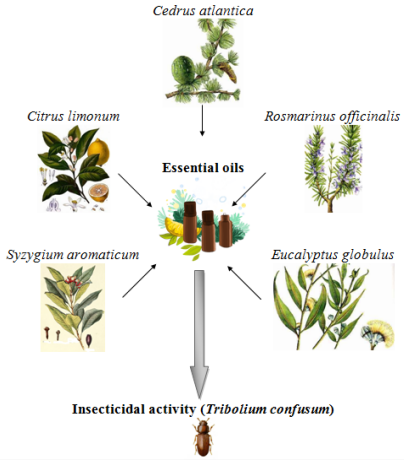
Abstract

The use of essential oils as bio-insecticides presents many previous world works particularly in Morocco. In addition, the present work is concerned with the measurement of the insecticidal activity of five essential oils: *Citrus limonum*, *Cedrusatlantica*, *Rosmarinus officinalis*, *Syzygiuma-romaticum* and *Eucalyptus globulus*, against insect pests of the flour (*Triboliumconfusum*).After extraction by a Clevenger distiller of the five species, the chemical composition of the extracted essential oil was studied by gas chromatography coupled with mass spectrometry (GC-MS). The majority identified compounds of *Citrus limonum* are: limonene, terpinene, paracymene, α-phellandrene, β-phellandrene, terpinolene. The major components of *Cedrusatlantica* are: α-Himachalene, β-Himachalene γ-Himachalene, β-Himachalene Oxide, α (E) -Atlantone. The majority compounds of *Rosmarinus officinalis* are: α-Pinene, Eucalyptol, Camphor, cis-Verbenone, α-Caryophyllene, β-Caryophyllene. The major compounds of *Syzygiumaromaticum* are: Eugenol, β-Caryophyllene, Eugenyl Acetate. The major compounds of *Eucalyptus globulus* are: α-Pinene, Limonene, Eucalyptol, α-Terpineol, α-Terpinyl Acetate.The insecticidal properties of the oils studied give an interesting anti-appetizing effect. A preliminary study showed that these oils have a high toxicity towards this insect.



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Biography

Ayoub AINANE, PhD. in physical chemistry, PhD work focuses on essential oils and their applications in the field of agriculture and food, particularly the anti-insecticidal activities of foodstuffs. 2 articles indexed in Scopus. H-Index: 0.3

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Investigation of Complex Impedance and Modulus Properties of La or/and Ca Doped $BaTiO_3$

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Abstract

$BaTiO_3$ (BT), $Ba_{0.99}La_{0.01}Ti_{0.9975}O_3$ (BLT), $Ba_{0.90}Ca_{0.1}TiO_3$ (BCT) and $La_{0.01}(Ba_{1-x}Ca_x)_{0.99}Ti_{0.9975}O_3$ (LBCTwith x= 0.1)powders were successfully synthesized by sol-gel process through Destabilization of Colloidal Solution (DCS) [1]. Sintering of pressed powders was performed at 1300 °C for 4h. XRD analysis showed a good crystallization of the samples in the pure perovskite structure, and allowed determination of the crystallite size. Microstructure morphology was analyzed using Scanning Electron Microscopy (SEM), and the grain size of the samples was estimated. Wide ranges of frequency (20Hz-1MHz) and temperature (ambient–400°C) dependence of the impedance relaxation were investigated. Both the complex impedance and modulus studies have suggested the presence of dielectric relaxation effects in bulk and grain boundary in the materials. Conductivity spectra reveal the presence of hopping mechanism in the electrical transport process of the samples.

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Biography

I havemy expertise in education, training and pedagogical ingineering. Myfocus is based on the integration of new teaching methods into the act teaching learning. I have obtained the aggregation diploma in physical sciences in 1990 from the ENS Takkadoum Rabat Morroco and I was awarded my Ph.D. in materials sciencesin 2007 from the Faculty of Science, DharMahraz Fes,Morroco. I publishedabout 3 papersin materials sciences and 1 paper in pedagogy.

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Comparative study of corrosion inhibitor effect in HCl 1M and H_2SO_4 0.5 M: *Cistus monspeliensis* L (CM) as green inhibitor for mild steel

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Abstract

The corrosion leads to significant economic losses concerning all industrial sectors. Among the methods of protection, the use of corrosion inhibitors are an indispensable technique for limiting the attack of materials in various media. In fact, these inhibitors molecules must be non-toxic, biodegradable and readily available in plenty. In this work, the incorporation of the aqueous extracts into the acids medium, evaluated by the electrochemical and gravimetric method at different concentrations of inhibitor *Cistus monspeliensis* L (CM) (*Cistaceae*) leaves in acid medium HCl 1M and H_2SO_4 0.5M, showed that the extracts of the plant has an anti-corrosion effect. In fact, the investigated inhibitor CM has shown good inhibition efficiency in these different acidic medium. The results of electrochemical impedance spectroscopy (EIS) indicate that the value of charge transfer resistance and inhibition efficiency tend to increase by increasing the inhibitor concentration. The efficiency obtained is 89% for the optimal concentration of 0.2 g/l in 1M HCl and 66% in 0.5M H_2SO_4 at room temperature. Moreover, the potentiodynamic polarization measurements show that CM acts essentially as a cathodic type inhibitor. The gravimetric results show that the adsorption of CM inhibitor obeyed Langmuir adsorption isotherm model in acid medium HCl 1M and H_2SO_4 0.5M.

Keywords: Mild steel, Inhibitor, EIS, Potentiodynamic Polarization, Gravimety.

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Biography

MechbalNaoual,Phd in faculty of sciences in university Mohamed firsti Oujda, I published 1 paper , journal morrocan for chemistry index in tomssonrothors.

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Synthesis, crystal structureand magnetic properties of bis(*N*,*N*-dimethylformamide)tetra(μ$_2$-thiopheneacetato-O,O')-dicopper(II)

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Abstract

Complexes containing two or more metal ions are of considerable interest not only because they offer high aesthetics in their structures but mainly because they offer new patterns in reactivity, magnetic exchange phenomena and the transfer of energy between their centers.

One dimeric copper carboxylate of formula *[Cu (taa)$_2$(dmf)]$_2$*(where taa denotes 2-thiopheneacetate anion) have been synthesized, structurally characterized, and his magnetic properties have been studied.The crystal structure of the complex belongs to monoclinic system with space group P2(1)/c, it consists of centrosymmetric dimers where the bidentate 2-thiopheneacetate anions form *syn, syn* bridges between copper (II) ions.The coordination polyhedron of each metal ion is completed by the dmf molecule, with a Cu … Cu distance of 2.632(6) Å.

The variable temperature magnetic susceptibilities of the complex have been measured in the range 2 – 400 K under external fields of 0.1T. The $X_mT$product at room temperature is close to the expected one for two isolated Cu(II) with S=1/2, when the T is lowered, $X_mT$decreases indicating the presence of a strong antiferromagnetic coupling between neighboring Cu(II) centers. The model leads to the following values, g(Landé factor) = 2.240, J(exchange coupling) = -321 cm^{-1}.

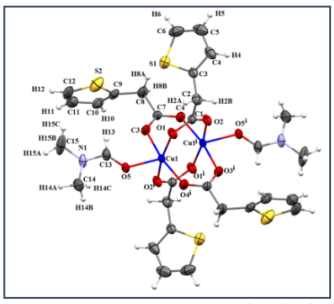

Fig1: molecular structure of *[Cu (taa)$_2$(dmf)]$_2$ dimer*

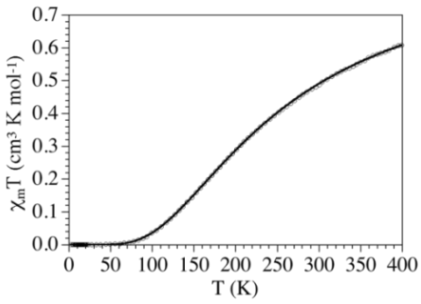

Fig2: $X_mT$as a function of temperature measured in field of 0.1 T

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Biography

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Physico-chemical study and phenolic metering of Rubus fruticosus of the Mediterranean zone of Morocco

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[2] Laboratory of physico-chemical materials, natural substances and environment, Department of Chemistry, Faculty of Sciences and Technology, AbdelmaleEssaâdi University, Tangier, Morocco.
[3] Department of Biology, Laboratory of Biochemistry and Molecular Genetics, Faculty of Science and Technology, University AbdelmalekEssaadi, BP 416, Tangier 90000, Morocco.

Abstract

Wild bramble (*Rubus fruticosus*) belongs to the *Rosaceae* family. It is very rich in essential and beneficial elements as polyphenols, as well as other pigments such as quercetin and tannins. In Morocco, despite its nutritional quality, this fruit remains among the forest species that are ignored.The present study has been focused on the physico-chemical characterization and quantification of phenolic compounds of this species.

The fruits have been harvested from the Mediterranean region of Morocco (Tanger-Tétouan-Al Hoceima Region). Analyses were made directly after the harvest for the determination of pH value, acidity, Brix, refraction index and total and reducer sugar levels. The phenolic compounds extraction has been carried out by ultrasound technic, associated with the ethyl solvent. The dosage of polyphenols, flavonoids and total anthocyanin was carried out by a spectrophotometer UV-visible.

The levels obtained in polyphenols, flavonoids and anthocyanin were 59, 37 mg GAE/g, 53,37mg EC/g and 0.55 mg/g respectively. Statistical analysis showed that the fruit contains a high and interesting nutritional quality. It must be valued by introducing it to our diet on a daily basis.

Biography

My research activities were started in 2015, in the Laboratory of Materials and Valorization of Resources, Department of Chemistry, where I studied the characterization biochemistry of the species 'Rubus fruticosus'. In parallel to this theme, I have been able to do research about phenolic compound of this fruit by different extraction techniques. Actually, I am in 3th year of my subject and I began to write my article that contains the latest results obtained from this study.

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Optimization of Microwave Assisted Extraction of phenolic compounds from celery leaf powder

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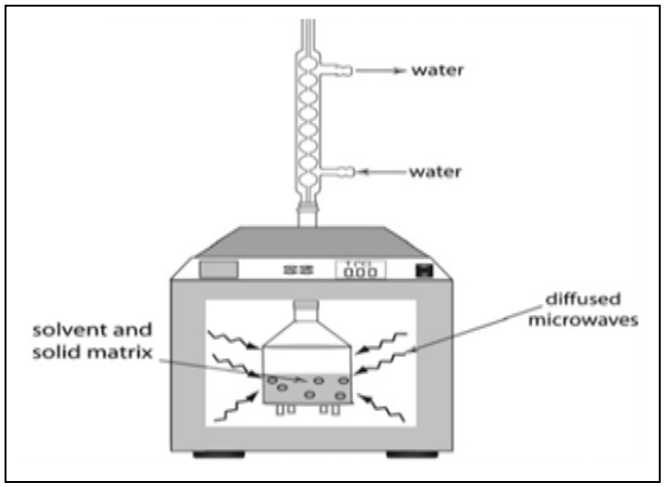
Abstract

Spice or herb drying is increasing from the high demand for flavoring ingredients as well as products of medicinal value. Celery (*Apium graveolens* L.) is one of these herbs that is usually dried and used for a variety of purposes [1]. However, it's important to know the effect of drying on the powder obtained, this by the determination of bioactive compounds including polphenols. For this purpose, the optimization such microwave assisted extraction (MAE) made by many authors [2], [3], [4] and [5] is adapted in the present study. The MAE was used to extract phenolic compounds from celery powder. The effect of four independent variables; solvent concentration, microwave power, irradiation time, and ratio were evaluated using the Response Surface Methodology (RSM). The analysis of results using the JMP software and the five-level CCD design allows choosing the optimal conditions of the MAE for obtaining a better yield of TPC and which are: 52% for the concentration of ethanol, 900W for the power, 44sec for the irradiation time and 49ml/g for the ratio. The experimental values are close to the predicted values, the predicted models are highly significant ($p \leq 0.05$) with high regression coefficients ($R^2 \geq 0.97$) and an insignificant lack of fit which confirms the validity of the mathematical model. For comparative purposes, the MAE was compared to a conventional extraction (husband bath) made using 49ml ethanol (52%) for 2h/60 °C. Statistical analysis of the results of the comparison showed no significant difference in terms of TPC content. Also, the evaluation of the antioxidant activity of the two extracts by four tests: DPPH, FRAP, NO and SO confirms the absence of significant difference between the two types of extraction. However, the MAE can be considered more efficient than the conventional method for obtaining TPC in terms of saving time.



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Biography

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MMT-supported for alginate bionanocomposite film incorporating essentail oil

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Abstract

Food safety, of which the microbiological quality of food is an essential component, is a major challenge. In terms of international trade, it is very often invoked to strengthen import barriers. In addition, it has a clear role to play in the prevention of food-borne illnesses and, as a result, contributes to the control of health expenditur [1] ; antimicrobial biodegradable films have received increasing attention because of their potential to delay microbial food corruption and reduce the risk of surface contamination of pathogenic microorganisms[2].
Among the many materials that can form edible films, alginate is an attractive film-forming compound because it is non-toxic, biodegradable and biocompatible [2-3];
The overall objective is to study the effect of incorporating essential oils (EO) of chamomile, lemon, lavender and olive oil (0.5, 1 and 1.5%) for two purposes. The behavior of antibacterial and total phenolic,. The results obtained are demonstrate a bactericidal effect of our composite and phenolic total content report that the majority of samples studied has antioxidant properties;
Second, microstructural specimen characterization is essential for understanding the relationships between structure and properties of nanocomposites by Fourier Transform Infrared Spectroscopy (FTIR) and Optical Magnification Magnification Microscope.

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Biography

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Synthesis by Microwave-assisted method and characterization of Er^{3+} activated $CaWO_4$

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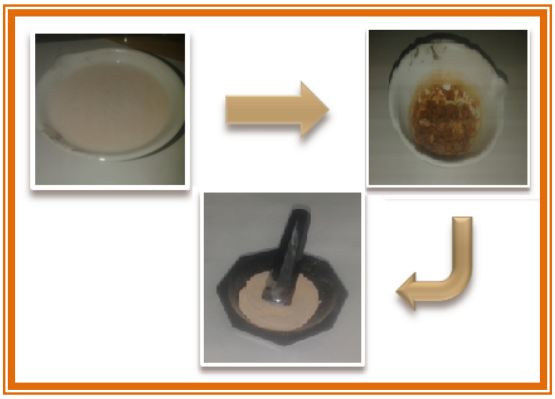
Abstract

The present work reports on the preparation of Calcium tungstate$CaWO_4$ doped with Er rare earth ion. The concentration of Er was varying as 0%, 1% and 4%. The synthesized samples by microwave irradiation method using Sodium tungstate Na_2WO_4 and Calcium Chloride dihydrate $CaCl_2$, $2H_2O$ as precursors have been characterized by X-Ray Diffraction DRX, Infrared Spectroscopy ATR-FTIR, X-Ray Fluorescence RFX techniques and The size distribution of particle and morphologies of the samples were determined using the Scherrer formula.The Inductively Coupled Plasma ICP-MS were performed for elemental composition.
Doped with rare-earth as Erbium, $CaWO_4$ found its application in many fields due to its interesting luminescence behavior.



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Biography

Author was registered her PhD in 2017 at the Ibn Tofail University, Morocco. Her expertise in materials, electrochemistry and environment, She made quite a lot of training courses in the domain of research laboratory and most importing it is the National Center for Energy, Sciences and Nuclear Techniques .
In 2017, she had a Master's degree of engineering of materials, treatment, characterization and quality control, she participated in tow international congresses in the AMPSEC was in Agadir and the second it is JME4 to Settat .she has participated in a publication of an article in the journal of JMES

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Effect of the metal loading on the catalytic oxidation of cyclohexene over ruthenium supported on titanium-pillared clay

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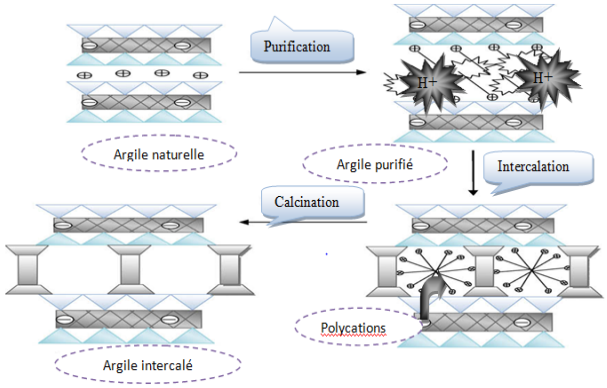
Abstract

The aim of this work is the valorization of bentonite-type clay from Maghnia (Algeria) as green catalyst for the production of added value fine chemicals. The modification of the clay structure by acid activation (H-Mont) and intercalation of transition metals such as titanium (Ti-PILC) and finally by impregnation of ruthenium, enhanced redox properties and increased Lewis and Bronsted acidity. Various x% Ru/ Ti-PILC were prepared and characterized by diffuse-reflectance UV–vis spectroscopy, surface acidity followed by FT-IR, chemical analysis, FT-IR, X-ray diffraction and nitrogen adsorption–desorption isotherms. The catalysts prepared were studied in the cyclohexene oxidation, using tert-butyl hydroperoxide as oxidant and heptane as solvent. All catalysts can selectively oxidize cyclohexene through allylic oxidation to give 2-cyclohexene-1-one (Enone) as the major product, and 2-cyclohexene-1-ol (Enol) as the minor product. With the catalyst 5% Ru/Ti-PILC, it was possible to reach 59 % cyclohexene conversion, 87 % selectivity to 2-cyclohexene-1-one and 13 % selectivity to 2-cyclohexene-1-ol, under ambient pressure, at the temperature of 70 °C, for a reaction time of 6 h. The materials were reused in four consecutive runs.

Catalyst	Conv (%)	Selectivity (%)	
		Enol	Enone
Blank	0	0	0
H-Mont	0	0	0
Ti-PILC	26	89	11
5% Ru/H-Mont	22	33	67
1% Ru/Ti-PILC	18	61	39
2% Ru/Ti-PILC	42	24	75
3% Ru/Ti-PILC	44	39	60
5% Ru/Ti-PILC	59	13	87



Effect of a compatibilizing agent on the morphology, interface and mechanical behaviour of recycled poly(ethylene terephthalate)/polypropylene blends

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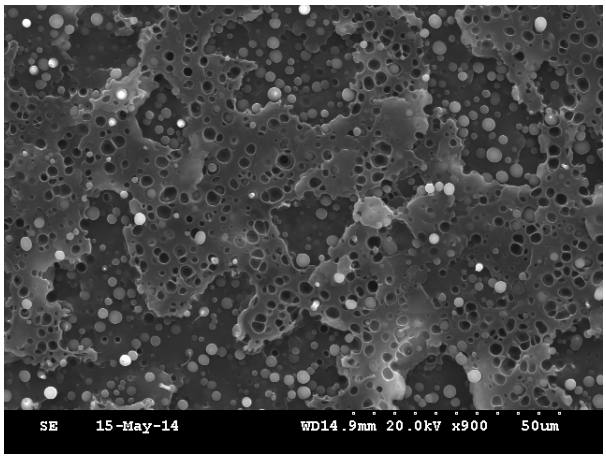
Abstract

Polyethylene terephthalate (PET) is widely used in the manufacturing of food packaging industry, especially mineral water bottles due to its high tensile and impact strength, chemical resistance, clarity, transparency, and good thermal stability. The production of PET bottles in large number has created a very large environmental problem, as most of these bottles do not decompose. The effective solution to deal with this problem is through recycling of used PET bottles. There are chemical and mechanical methods for recycling of PET. The last one includes re-melting and mixing of PET with other polymers and reinforcing fillers, is the widely used because it's the easiest and the cheapest to perform.In this study, Binary blends of polypropylene (PP)/recycled poly(ethylene terephthalate) (r-PET), and ternary blends of PP/r-PET (80/20 w/w) compatibilized with various amounts (2.5, 5 and 10 wt%) of maleic anhydride grafted polypropylene (PP-*g*-MA) were prepared on a twin-screw extruder. The effect of the compatibilizer content on the morphological and mechanical properties of PP/recycled PET blends was investigated. Tensile strength, and tensile strain at break, improved with the addition of the compatibilizer. The compatibilized blends had a smaller size of dispersed phase compared with the uncompatibilized blends. This may result from the enhanced interaction between the matrix and dispersed phase.



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Biography

Author has her expertise in composites and blends. She was warded her PhD in 2015 from the University of Bejaia, Algeria

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Biodegradability of lead dioxide in aqueous organic acid solutions

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Abstract

Processing industries generate wastes that can be found in the nature causing environmental pollution [1-3]. Among these wastes heavy metals and their oxides are considered as very problematic for living creatures. Lead dioxide is one of the most harmful compounds that can be found in landfills [4-6]. It may react with different components present in soil such as organic acids leading to dissolve it and consequently pollute the environment [7-9].

In this study we were interested on the kinetic release of lead dioxide when contacting two organic acids usually present in the nature which are citric and acetic acids. The effect of acid concentration and temperature were investigated. The results have shown that the dissolution of lead dioxide in the presence of acetic acid was faster than in citric acid. The complexometric character of citric acid may be the cause of such behavior.

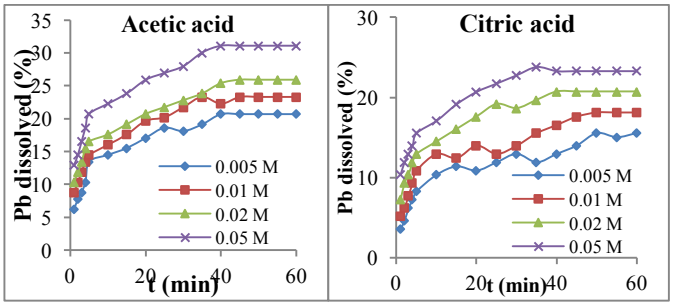

Fig.1. Effect of the concentration of acetic and citric acids on lead dioxide dissolution. Operation conditions: liquid/solid=2.5L/g, agitation= 0 rpm, T=25°C, m_{PbO2} =0,1152g .

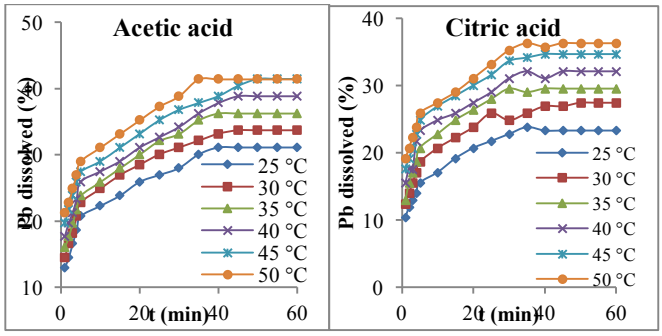

Fig.2. Effect of temperature on lead dioxide dissolution with acetic and citric acids. Operation conditions: C_{acid} = 0,05M, liquid/solid=2.5L/g, m_{PbO2} =0,1152g ,agitation= 0rpm.

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Biography

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Study of the Delayed Behavior of Kenaf Fibres

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Abstract

The elastic behavior of plant fibers is nowadays better mastered within the scientific community.During quasi-static tensiletests on plant fibers, several types of behavior are observed indicating viscoelastic behavior.Thus, the knowledge of the viscoelastic behavior of the plant fiber is essential to master the in-service behavior of the composite, which is generally attributed only to the behavior of the matrix. The aim of this paper is to collect information on the viscoelastic behavior of plant fiber.A characterization of the delayed behavior of elementary kenaf fibers under relaxation in a constant environment was carried out. The results show a significant decrease in stress under constant strain (0.36%) over 180 minutes from 268.71 MPa to 88.14 MPa. These results demonstrate the viscoelastic behavior of Kenaf fiber. In addition, the experimental results are discussed and commented from the rheological models. Finally, the relaxation module is simulated by the method developed by Flory and Mc Kenna in 2004.

Figure: Bast fiber of kenaf.

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Biography

Areas of expertise are the manufacturing, and characterization of green materials based on plant fibers.Also the simulation and modeling of the mechanical behavior of materials; For future application in building and plaster reinforcement. The author is Assistant in the Department of Mechanical Engineering of UIT Ngaoundere and PhD student, registered at the School of Applied Physics and Engineering of the University of Ngaoundere in Cameroon.

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Sulfuric acid immobilized on hydrothermal carbon as highly efficient and heterogeneous catalyst for the One-Pot synthesis of 2-substuted benzimidazole

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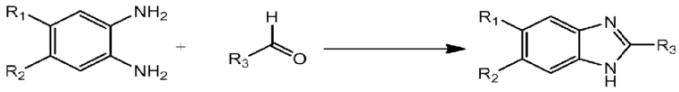
Abstract

The benzimidazole nucleus is one of the most significant N-containing fused organic compounds in a large diversity of natural products and synthetic pharmaceutical materials [1-2]. The benzimidazole derivatives are known to demonstrate various biological properties [3]. Several drugs have been developed based on benzimidazole nucleus and marketed by various pharmaceutical companies [5]. A diversity of conventional procedures has been described for the preparation of benzimidazoles. One of the popular conventional methods for the preparation of these important compounds is cylization of o-phenylenediamine with carboxylic acids or aldehydes. In our work, we use as heterogeneous acid catalyst hydrothermal carbon coated with sulfuric acid. This new immobilized catalyst was successfully applied for synthesis of benzimidazoles via condensation of a wide variety of aldehydes with a variety of 1,2-phenylenediamines , In well determined conditions (figure 1). The catalyst has been prepared and reused without significant loss of its activity.

Figure 1



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Biography

Author has her expertise in the development and characterization of new recyclable catalysts for the preparation of therapeutic molecules. PhD student at Cadi Ayyad University, Faculty of Sciences Semlalia Marrakech, Morocco

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The reactivity of lamellar materials based on manganese towards heavy metals

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Abstract

Heavy metals are chemical elements that have metallic properties. In spite of their economic importance and their added value, the presence of these metals in the aquatic environment presents a serious problem due to their toxicities as well as their resistance to biodegradation. Indeed, heavy metals have a devastating effect on the function of human and animal organisms, they have the ability to focus along the food chain and accumulate in certain organs and tissues and cause irreparable damage to health. Thus, the metals are very diverse, present in the aquatic medium in cationic form (example: Ni^{2+}, Pb^{2+}, Cd^{2+}, Zn^{2+}) at different concentrations. It is therefore advisable to eliminate, or reduce, the heavy metals present in different effluents.

In order to solve the problems related to pollution caused by heavy metals, several studies have been executed, such as chemical, physical, biological treatments and also membrane processes. Methods based on the use of non-toxic nanometric and non-expensive material appear as promising methods.

So, in order to contribute to the development of new methods of treatment, we have developed lamellar materials based on manganese .The materials developed are characterized by X-ray diffraction (XRD) and scanning electron microscopy (SEM), before being targeted for a study to remove heavy metals (Pb^{2+}, Cd^{2+} et Zn^{2+}) from the aquatic environment. We studied the influence of many parameters during interaction between the solid phase (material) and the liquid phase (solution containing the heavy metal). The study executed shows that the use of synthetic materials, for heavy metals removal, gives interesting results. For example 95% of Pb was removed for one hour of treatment.

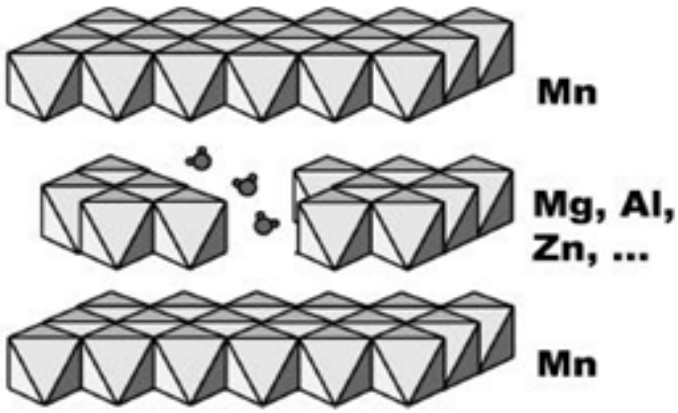

Figure: lamellar structure of material based on manganese

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Elastic–plastic analysis of three-dimensional functionally graded materials under mechanical loading

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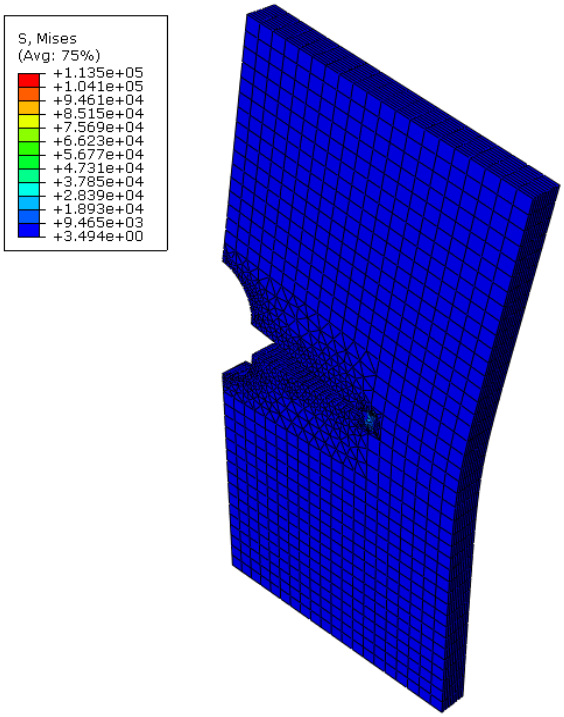
Abstract

This paper introduces a numerical non-linear finite element investigation based on the J-integral fracture analysis and the mechanical behaviour of a power-law (P-FGM) and exponential law (E-FGM) property gradient material plate of functionally graded materials (FGMs) plate with a side semicircular notch that are subjected to mechanical Mode I and mixed-mode loading. The FGM plate consisting of two constituent materials has been considered. The top surface is assumed to be rich in ceramic (TiB) and the bottom surface is assumed to be rich in metal (Ti).The Poisson's ratio of the FGM plate is assumed to be constant. The plate is subjected to external stresses. During the elaboration of the structure, a crack develops under the effect of external solicitations that cause damage to this structure.



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Biography

In our study we will make a comparison between the different P-FGM and E-FGM beam models by using the integral J. determined by the finite element method (ABAQUS code), integrating the subroutine USDFLD to define the gradual function of the module of young. Finally, a comparison of the results of the different types of P-FGM, E-FGM beams was made.

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Quality factor enhancement in phononic crystal utilizing the disc shape cavities

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Abstract

The Phononic crystals are created by periodic arrays of elastic structures displaying a strong contrast in their elastic properties and density. These materials can be arranged into one-dimensional (1D), 2D and 3D structures. The ability to control the propagation of elastic waves with such composite materials has attracted a considerable attention during the last two decades from science and technology points of view [1]. The interest in phononic crystals has been generated by their unique properties such as the formation of band-gaps, near zero group velocity, and anomalous dispersion (negative refraction). These properties make phononic crystals a viable choice for use in the design and implementation of components for Radio Frequency Micro-Electro- Mechanical Systems (RF MEMS) including filters, resonators, and advanced signal processing functions [2-6].

In this work, we introduce a new design of cavity resonator design based on 1D phononic crystal structure. The structure is made of a corrugated AlN thin membrane; the central micro-strip line supports periodic gold disc shaped thin layer. The structure is completely different to cavity designs presented in most previous works where the cavity is obtained by removing a portion of the crystal or by changing the geometric parameters of the unit cell. In our case, the phononic crystal design remains unchanged and a disc shaped resonator was introduced as a defect. The design combines the advantages of: i) micro-machined electroacoustic devices based on the S_0 Lamb wave mode. ii) 1D phononic crystal that provides the suppression of mechanical energy leakage from the disc resonator to the supporting structure. iii) disc shape resonator structure that supports radial contour modes like whispering gallery and breathing modes characterized by their high Q factor owing to their in-plane modal vibration.

Figure 1(a) shows the results for one and two micro-strips surrounding the cavity layer. First, we can notice that as the number of phononic crystal layers' increases, the location of the resonant frequency peak remains unchanged. Secondly, we can notice that the quality factor drastically increases by increasing the phononic crystal size giving rise to an efficient acoustic isolation as it is described in the displacement field displayed in Fig. 1(b).

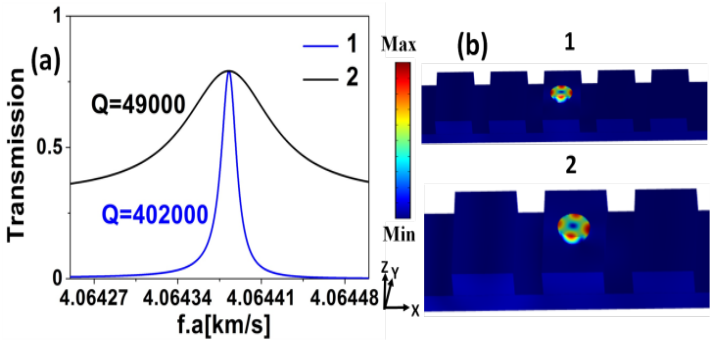

FIG 1. (a) Evolution of the quality factor verus phononic crystal size (b) Total displacement field distribution for the flat modes labeled 2 at **Γ** point.

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Biography

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Improvement of chemical, thermal and mechanical properties of Polyvinyl Alcohol (PVA) by using Multi-Walled Carbon Nanotubes (MWCNTs)

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Abstract

Polymers-MWCNTs composites are increasingly applied in customer products and many large-volume industries, such as medical, construction, industrial, and agriculture applications. The current research aims to improve the chemical, thermal, and mechanical properties of polyvinyl alcohol (PVA) as a matrix material by adding different concentrations of (0.5, 1%) MWCNTs fillers.MWCNTs have been amended with the mixture Nitric Acid / Sulfuric acid (HMO_3/H_2SO_4)to achieve the functionalization (COOH-MWCNTs) when combining with the polymer (PVA). The MWCNTs fillers as a reinforcing agent have enhanced the high interaction with PVA and followed by Fouriertransform infrared spectroscopy (FTIR). Thermo-gravimetric analysis (TGA) was used to monitor the thermal decomposition of PVA-MWCNTs composites as well as neat PVA from room temperature up to 700°C. The results of TGA showed that the higher addition (1%MWCNTs) into PVA improved the slightly thermal stability of composites. Mechanical tests such as the tensile, modulus of elasticity, and elongation at break % were evaluated of neat PVA and compared with PVA-MWCNTs composites. The obtained results showed that the higher addition of MWCNTs into PVA led of significant increasing of the tensile strength, modulus of elasticity, and a decrease of % elongation at the break because interfaces between MWCNTs fillers and neat PVA caused of reduced the brittle behavior and enhanced the high crosslinking of neat PVA.

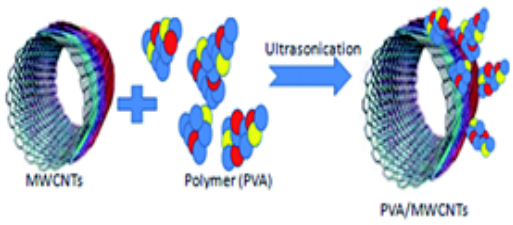

Fig 1. The chemical interaction between PVA and MWCNTs

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Biography

Sameer A. Awad is interested in polymer composites and material science. His research focuses on the synthesis of polymer composites and using natural and inorganic fillers as modifiers for polymers and that be useful in industrial applications was awardedhis master in chemical science in 2008 from University of Anbar,Iraq. He published more than 12 papers and participated in several International and domestic conferences.

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Corrosion behavior controlled by 2,5 bis(4-pyridyl)-1,3,4 oxadiazolefilm with both classic and self-assembly deposition method on carbon steel substrate

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Abstract

Pyridyle Oxadiazole (PO) derivatives have been synthesized and used as organic corrosion inhibitors for carbon steel substrates in 1M HCl solution. And, in order to investigate their efficiency, electrochemical and non-electochemial methods were used. These substances were examined with Open Circuit Potential study (OCP); Electrochemical Impedance Spectroscopy (EIS); Polarization Resistance (RP), Tafel Curves Polarization and confirmed with weight loss and scanning electron microscopic measurements. The experimental study showed a slight difference between the oxadiazole derivatives in term of efficiency and the chosen derivative was restudied after adding free radicals -NH2, -OCH3, -OH …. Another study called Self Assembley Method (SAM) was studied as a new protection technique that acts through films deposition , the presence of these films reduce corrosion by blocking the steel surface from the oxygen dissolved in the acid medium. The relative inhibition efficiencies of these inhibiting agents in preventing steel oxidation are found to be more efficient with the temperature and concentration increase; Also we used different pretreatments to strengthen the molecule bonds before the SAM deposition, such as phosphating, plasma N_2 and others. Potentiostatic polarization study showed the cathodic adsorption type and the molecules adsorption on steel surface obeys Temkin adsorption isotherm.

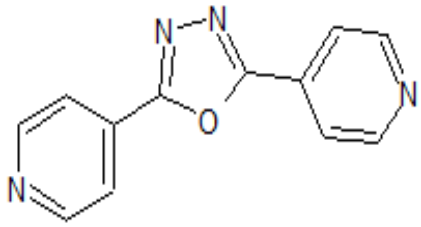

Figure 1: 2,5 bis(4-pyridyl)-1,3,4 oxadiazole (4-pox)

Biography

Imane NADI , PhD student in Faculty of Science Chouaib doukkali - El Jadida. she works on corrosion inhibition of carbon steel in acidic medium by organic compounds.

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3,5-Diaryl-4-amino-1,2,4-triazole Derivatives as Effective Corrosion Inhibitors for Mild Steel in Hydrochloric Acid Solution: Correlation between Anti-corrosion Activity and Chemical Structure

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Abstract

The corrosion inhibition efficiency of newly synthesized 3,5-diaryl-4-amino-1,2,4-triazole derivatives was investigated for mild steel corrosion in 1.0 M HCl medium using weight loss quantum chemical calculations and Monte Carlo simulations. It was found that the studied compounds exhibit a very good performance as inhibitors for mild steel corrosion in 1.0 M HCl. The results show that the inhibition efficiency increases with decreasing temperature and increasing concentration of inhibitors. The kinetic parameters such as Ea, ΔHa, and ΔSa were evaluated. It was found that the adsorption for these inhibitors on the mild surface obeys the Langmuir adsorption isotherm at all studied temperatures and the adsorption isotherm parameters (Kads, , , and) were determined and discussed. The values of inhibition efficiency for all triazoles followed the order 3-APAT < 4-APAT < 4-DTAT < 4-MAT < 3,4-MAT. The 3,4-methoxyphenyl substituted triazole (3,4-MAT) exhibited the highest inhibition efficiency of 98.5% at concentration of 1 × 10–4 M. Quantum chemical calculations using the Density Functional Theory (DFT) were performed on the 3,5-diaryl-4-amino-1,2,4-triazole derivatives in an attempt to correlate the corrosion inhibition properties of these 1,2,4-triazole derivatives with their calculated quantum chemical parameters. Furthermore, Monte Carlo (MC) simulations were applied to search for the most stable configuration and adsorption energy for the interaction of inhibitors on Fe (110)/30 H2O interface. A good correlation was observed between the Monte Carlo calculations and experimentally inhibition efficiency data. Keywords: corrosion inhibition, mild steel, triazole derivatives, Monte Carlo simulations.

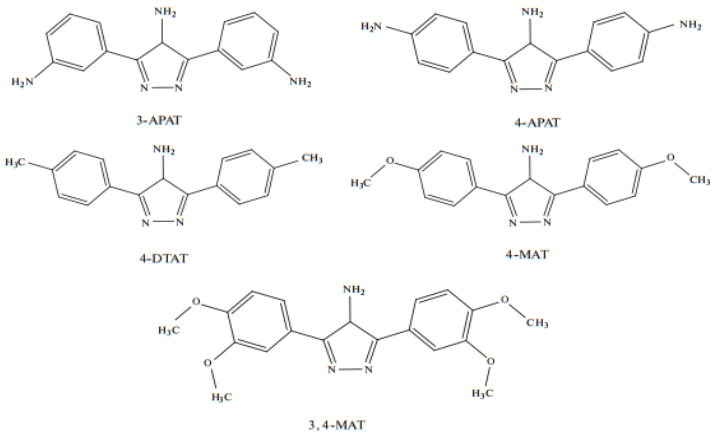

Fig. 1. Molecular structures of the studied 3,5-diaryl-4-amino-1,2,4-triazole derivatives.

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Biography

Mustapha Tourabi, PhD student in Faculty of Science Chouaib doukkali - El Jadida. he works on the inhibition of corrosion of steel in acidic medium by organic compounds. he has published 11 articles.. His H-index is 4 on Scopus.

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Effect of SiO_2 nanoparticles on the transitions of phases of composite materials polymer/ liquid crystal

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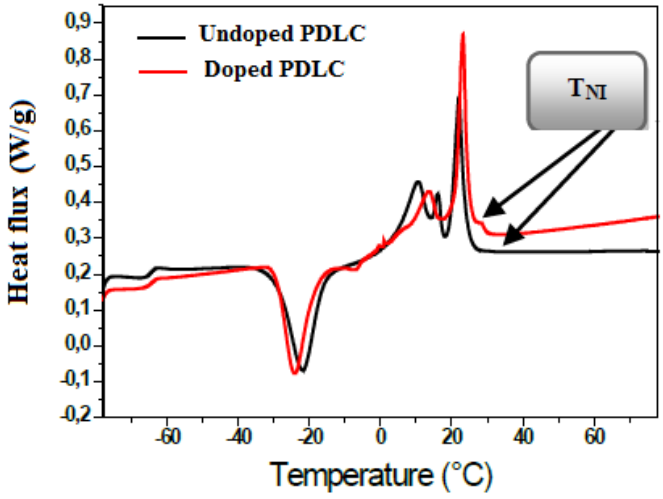
Abstract

PDLC composites are generally in the form of thin films consisting of a dispersion of micrometric droplet of CL in a solid polymer matrix. We are interested in the effect of the addition of inorganic nanoparticles on the electro-optical response of these materials to meet the needs of new technology for optical and electro-optical applications. These nanocomposites are prepared by dispersion of inorganic nanoparticles in a mixture of monomer and liquid crystal under ultrasound, followed by a photo- polymerization under UV radiation. Our choice fell on a monofunctional monomer of acrylate EGPEM, agent crosslinker HDDA, a Nematic Liquid Crystal 5CB and silica SiO_2 size 10 nm for doping. The analysis by polarizing optical microscopy (MOP) allows observing the dispersion of these nanoparticles in the material. This analysis is correlated with the electro-optical study to improve their electro-optical properties. The study of different phase transitions: T_g PDLC, T_g and T_{NI} (isotropic Nematic transition) of the 5CB by DSC revealed a remarkable change of these transitions following doping conducted by SiO_2 on PDLC materials.



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Effet du taux de substitution du Zn dans la phase HDS sur leur propriété structurale

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Abstract

Les hydroxydes doubles sels (HDS) constituent une classe de matériaux lamellaires avec une formule générale $[(M^{2+}_{1-x},Me^{2+}_{1+x})(OH)_{3(1-y)}]^{+}A^{n-}_{(1+3y)/n}\cdot zH_2O]$;dans lequel M^{2+} et Me^{2+} correspondent aux métaux divalent tels que Ni, Co, Cu, Mn, ou Zn et X^{n-}est l'anion échangeable.

Dans ce travail des HDS nitratés de type Zn-Co, Zn-Cu, Zn-Fe et Zn-Ni,sontsynthétisésà partir des précurseurs d'oxyde de zinc et de nitrates de métal correspondant.Pour la phase Zn-Ni, différents rapports molaires ($R = M^{2+}/Me^{2+}$) ont été utilisés.

Les échantillons ayant subies différents traitementssont caractérisés par les divers méthodes d'analyses telles que la diffraction des rayons X, la spectroscopie infra-rouge et l'analyse thermique. Les résultats obtenus montrent que la nature du métal utiliséet le taux de substitution du Zn a un effet sur la structure des phases HDS préparées.

Mots clefs: hydroxydes doubles sels (HDS), Zn, DRX, IR, ATG, ATD.

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Comparative study of corrosion inhibition by Nerium oleander extract for aluminum and mild steel corrosion in 1M HCl: EIS method

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Abstract

Mild steel and aluminum are the most used metals in the industrial activities. Therefore, minimizing the losses caused by corrosion has become a crucial aim for industrials. For this reason, the main end of the present work is evaluating the corrosion inhibition of mild steel and aluminum in hydrochloric medium using an eco-friendly inhibitor. In fact, organic synthesized inhibitors are mainly toxic for the environment. In the other hand, using plants extracts is a green way to decrease corrosion rates.Nerium oleander extract is used as green corrosion inhibitor for mild steel and aluminum corrosion. Electrochemical impedance spectroscopy is the main method used to investigate the inhibition efficiency of NO extract. The electrochemical measurements were carried out at room temperature. Two method of extraction have been used: Maceration and Microwave assisted extraction.

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Structural and electronic properties of compounds XSb2 (with X = V and Fe)

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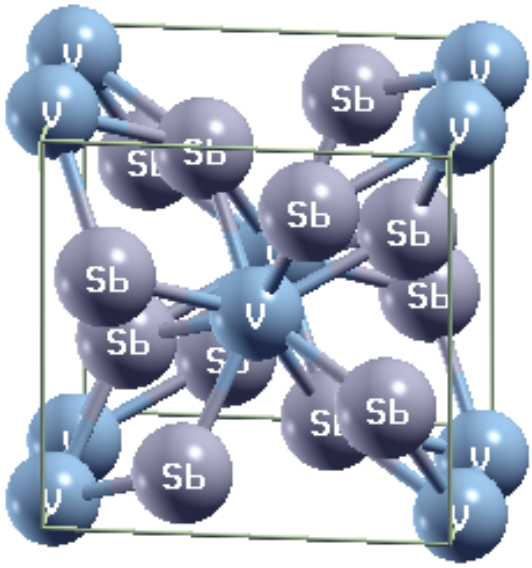
Abstract

This work was devoted to study of structural and electronic properties of compounds XSb_2 (with X = V and Fe). Thus, we have calculated the minimum total energy E_{min}, the compression modulus B (GPa), its derivative BP, the density of state "DOS" and band structure. We have been interested in this type of material because they are often used in electrochemical cells, photovoltaic solar cells [1]...

The calculations were performed by full-potential linearized augmented plane wave method (FP-LAPW) as part of the density-functional theory (DFT). To determine the exchange and correlation potential, we used the generalized gradient approximation "GGA" and the modified Becke-Johnson potential "mBJ" [2], which was recently published by Tran and Blaha [3]. These methods are implemented in the code Wien2k. The compound VSb_2 crystallizes in the tetragonal structure of $CuAl_2$ type, space group I4 / mcm [4] and the compound $FeSb_2$ crystallizes in the orthorhombic structure, space group Pnnm [5]. We have started our work by optimized the structural parameters of studied materials to have stable structures, which allowed us to take a number of points K = 800 and a product value $RMT_{min} * K_{max} = 8.5$ for VSb_2 and $RMT_{min} * K_{max} = 9$ for $FeSb_2$.

Subsequently, we calculated the electronic structure of the two materials, using the GGA approximation. The results obtained indicated that these compounds have a metallic character.

This result has been confirmed by the mBJ method for VSb_2 . Whereas for $FeSb_2$, this last study showed a semiconductor character with a gap of 0.278 eV, which is in agreement with other works that find a gap of 0.248 eV [1].



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Biography

The author is expert in materials sciences, the field of renewable energies and more particularly the photovoltaic conversion of energy and the electrochemical storage of energy. He works on improving and / or designing new materials. He obtained his doctorate in 1993 from Paris VI University, France.

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Adsorption Studies of Some Heavy Metal Ions onto C-4-bromophenylcalix[4]resorcinarene

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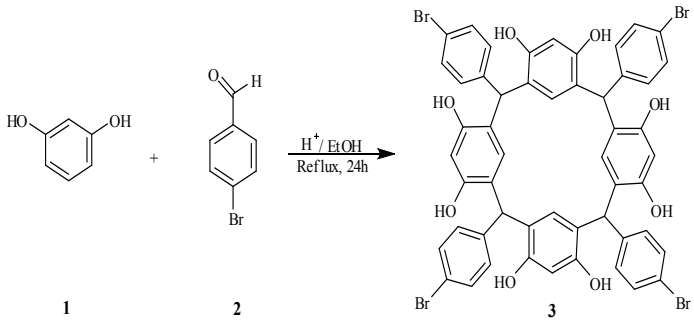
[2] *Department of Chemistry, Lebanese University 3rd Branch, Tripoli-Lebanon*

Abstract

Adsorption studies were performed on selected heavy metals ((Pb(II), Co(II), Cu(II), Mn(II) and Zn(II)) using synthetic adsorbent (*C*-4-bromophenylcalix[4]resorcinarene **3**) to investigate the effect of different parameters such as adsorbate dose, agitation time, and pH. Selectivity of the adsorbents towards a mixture of heavy metals adsorbates was investigated. Results showed that optimum agitation time of 30 min at pH of 5.6 at initial concentration of 1ppm for all investigated heavy metals. Different kinetic models of Santosa first order, Lagergren pseudo first order and Ho pseudo second order were applied on the adsorption experimental data. Results proved that all adsorption processes were followed and adopted pseudo second order kinetic model. The adsorption capacity of *C*-4-bromophenylcalix[4]resorcinarene towards the selected heavy metal ions was 84.55%, 84.29%, 84.06%, 79.76%, 75%, for Cu(II), Pb(II), Zn(II), Mn(II) and Co(II), respectively. Selectivity of adsorption was tested on a mixture of Cu(II), Mn(II), Zn(II), Pb(II) and Co(II) with initial concentration of 1 ppm of each heavy metal and agitated time of 10 min with the adsorbent, removal percentage of each metal showed different values from each heavy metal alone as it was in decreasing order Cu(II) > Co(II) > Mn(II) > Pb(II) > Zn(II). The rate constant value for each heavy metal adsorption mechanism obtained from Ho pseudo second order model was in the order Co(II) > Cu(II) > Zn(II > Mn(II) > Pb(II).



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Biography

Author has expertise in synthetic organic chemistry as well application of organometallic complexes as catalysts in developing synthetic methodologies. In addition, he has interest in synthesizing and charatarization and application of calixarene materials.

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Donor-Acceptor Organic Materials with low Band-gap for Photovoltaic Applications: A Density Functional Theory Investigation

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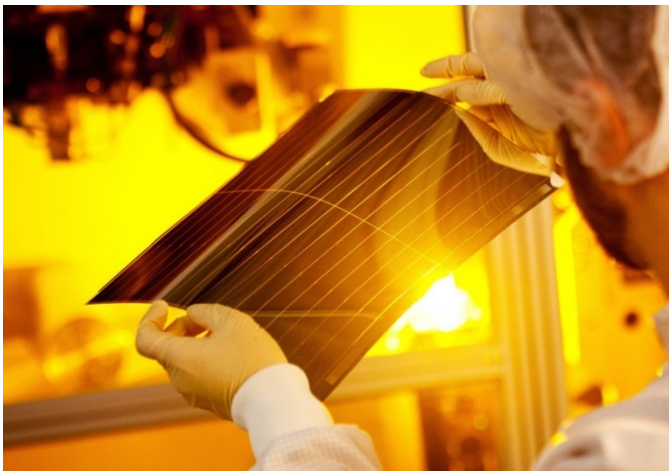
Abstract

During the past decade, π-conjugated molecules based electronic materials have been extensively investigated as novel class of semi-conductors and are frequently studied because of their promising opto-electronic properties. Due to their important specific properties, these new compounds had become the most promising materials for a range of industrial applications such as photovoltaics. In this work, we present theoretical study of the structural and optoelectronic properties of new π-conjugated compounds by quantum chemistry using DFT (Density Functional Theory) and B3LYP hybrid functional density to obtain full geometries optimization. The absorption spectra were simulated by TD/DFT (Time Dependent Density Functional Theory). With the goal to find potential sensitizers for a good use in organic solar cells. Different electron side groups were introduced to investigate their effects on the electronic structure. Hence, electronic and optical properties have been reported in order to predict the Bulk-heterojunction (BHJ) solar cell device efficiency for the studied compounds. Hence, we will scan the rapport between the molecular, the electronic structure and the efficiency of the solar cell in order to give further insights on the possibility of electron transfer between the donor and the acceptor entities in our materials.



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The influence of Pseudomonas Aeruginosa on the corrosion behavior of single-phase Cu-Zn alloy in an artificial drinking water

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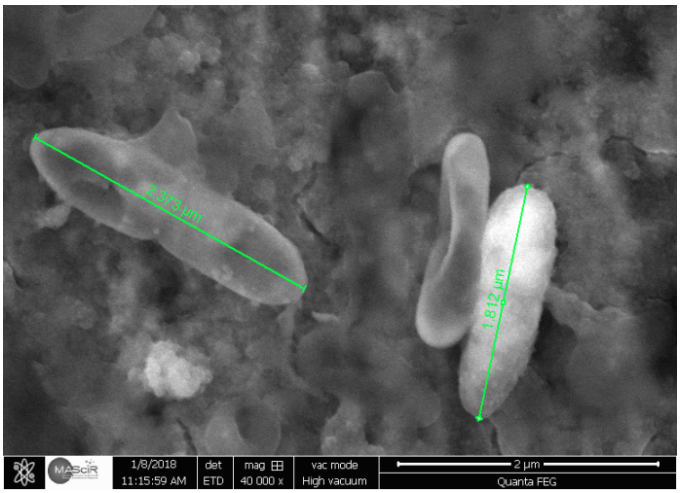
Abstract

The aim of the present work is to provide an idea on the electrochemical phenomena that occur during the biofilm formation, the joint use of microbiological and electrochemical methods allowed us to study the behavior of brass in a artificial drinking water to which a bacterial suspension of Pseudomonas aeruginosa is added, by evaluating the ability of this bacteria to colonize the surface of the studied alloy. This study was carried out using stationary electrochemical methods of potential monitoring (OC), polarization and transient curves (electrochemical impedance spectroscopy) to evaluate the effect of the presence of the bacterium on the corrosion behavior of brass (Cu-Zn). The Inductively Coupled Plasma Spectroscopy (ICP-OS) method was used to monitor the evolution of Cu^{2+} and Zn^{2+} ions concentration. the monitoring of sessile bacteria evolution is provided by microbiological methods (enumeration of adhered bacteria). Pseudomonas aeruginosa has a remarkable effect on the corrosion of the studied brass, this is due to the formation of biofilm which prevents the formation of a protective oxide film on its surface, favoring its attack (micro-pitting) which is due mainly to differential aeration underneath the biofilm.



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Inhibition effects of imine derivative on the corrosion of carbon steel in hydrochloric acid solution

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Abstract

The inhibitive action of some imine derivatives, against the corrosion of mild steel in molar hydrochloric acid solution has been investigated using weight loss measurements, potentiodynamic polarisation (PP) and electrochemical impedance spectroscopy (EIS) techniques. The experimental results obtained revealed that these compounds perform excellently as corrosion inhibitors in acid solution.

it was shown that the inhibition efficiency increased with the concentration of the inhibitors and achieved up to 90% at 10^{-3} M (298K). the curves obtained by Potentiodynamic polarizations shows that these compunds behave as mixed-type inhibitors. The results obtained from the different corrosion evaluation techniques are in good agreement.

The values of ΔG_{ads} obtained in the temperature range 298-338K refer to the Phenomenon of chemical adsorption according to Langmuir isotherm adsorption.

Keywords: Corrosion inhibition, weigh tloss measurement, potentiodynamic polarisation, electrochemical impedance spectroscopy.

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Biography

Soukaina ALAOUI MRANI is a Ph. D student in the first year, specialty chemistry, at the Faculty of Sciences DharMehraz, University SidiMohamed Ben Abdellah. His subject is based on the use of chemometric tools for the study of the inhibition of corrosion of a metal by organic compounds.

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Effect of titanium content in glass system inhibitor on the corrosion behavior of ordinary steel in 3% NaCl medium

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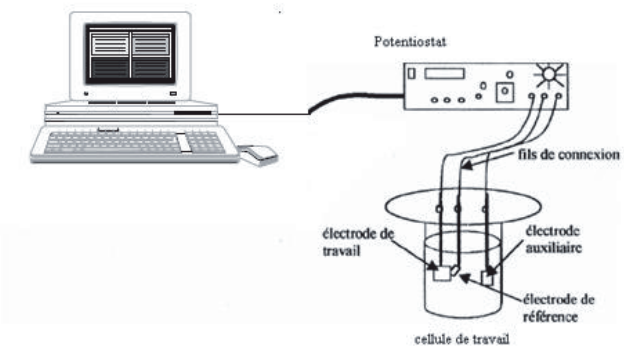
Abstract

The cooling water circulates to operating units where it picks up heat while cooling or condensing process streams and the resulting warm water is returned to the cooling tower. However, ordinary steel has been one of the preferred materials in industry such as cooling water systems. Thus, ordinary steel corrosion and its inhibition in a wide variety of media, particularly when they contain chloride ions, have attracted the attention of many investigators [1]. For many industry that do the treatment of cooling water circuits use different formulations to protect the pipes against corrosion. The majority of inhibitors that used in these mediums are inorganic compounds [2].

The objective of this study is to investigate the influence of inhibitor (glass) addition on the corrosion of ordinary steel in 3% of Nacl solution. The results obtained show that these compounds have a better inhibitory efficiency and it depends on the inhibitors concentrations, Finally, it is proved that the inhibition performance of these glasses were indeed improved by immersion time

Keywords: Glasses, Corrosion, inhibition, Ordinary steel, 3% NaCl.

Image



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Biography

Author has his expertise in Materials and synthesis of vitreous compounds. he was received his PhD in 2001 at Ibn Tofail University, Morocco. He had published more than 15 papers in international journals with H-index = 8.

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Study of corrosion behavior of Ni-P and Ni-P-TiO2 coating on a steel rebars deposited by electroless deposition in simulated concrete pore solutions in marine industrial environments

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Abstract

Electroless coating is a chemical reduction process which depends on the catalytic reduction of a metal ion in an aqueous solution containing a reducing agent and subsequent deposition of the metal without the use of electrical energy. The co-deposition of organic or inorganic fine particles with autocatalytic coatings produces electroless composite coatings which provide wear–resistance, corrosion resistance…

In this research work, the Ni-P and Ni-P-TiO_2 coatings were prepared on reinforcement steel using autocatalytic coating methods and their morphology, microstructure, phase and electrochemical behavior were observed by scanning electron microscopy (SEM), X-ray diffraction (XRD), and potentiostat respectively. The SEM images showed that the TiO_2 particles dispersed uniformly in the Ni-P matrices. The XRD pattern showed that the incorporation of TiO_2 particles increases the amorphous nature of the coating, which improves the anticorrosive property of the coating. The electrochemical behavior of reinforcing steel, Ni-P alloy coating and Ni-P-TiO_2 composite coating confirms that the introduction of TiO_2 particles increases the corrosion resistance of reinforcing steel in simulated concrete pore solutions in a marine industrial environment.

Keywords : *Electroless, Reinforcing steel ; EIS ; Potentiodynamic polarization ; Corrosion ; Chloride ; SEM ; XRD ; simulated concrete pore solution.*

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From Natural Products to their Biotechnological Applications

Oral presentations

The effect of the Spinaciaoleracea extract on the control of the green mold "*Penicilliumdigitatum*" at the post harvested citrus

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Abstract

Penicilliumdigitatum, the causal agent of citrus green mold is responsible for 90% of post-harvest losses. Chemical fungicides used are responsible for damage to human health and the environment. The aim of this study is to evaluate the ability of *Spinaciaoleracea* extract to serve as biological control agents, in alternative for storing fruit.

The implication of a crude extract of a green plant, *Spinaciaoleracea* as biopesticide is evaluated. Thus, *in vivo* antifungal tests as well as adhesion test were done. Oranges were pulverized with crude extracts at different concentrations ranged from 25 g L^{-1} to 200 g L^{-1}, contaminated by the fungus and then observed during 8 weeks for their macroscopic changes at 24 °C. The adhesion index is defined as the number of *Penicilliumdigitatum*spores fixed per orange cell. An index greater than 25 is the indicator of a strong adhesion, whereas for an index less than 10, the adhesion is low. Results showed an inhibitory activity of the *Penicillium* development with the aqueous extract of dry *Spinaciaoleracea*with a concentration of 50 g L^{-1} considered as the minimal protective concentration. The extracts showed a greater inhibition of the development of *P. digitatum* up to 10 weeks, even greater than the fungicide control Nystatin. Adhesion test's results showed that the adhesion of *P. digitatum* spores to the epidermal cells of oranges in the presence of the crude spinach leaves extract is weak with adhesion index of 2.7. However, a high adhesion was observed with water used a negative control.In conclusion, all these results confirm that the use of this green plant highly rich in chlorophyll could be employed as a great treatment for protection of oranges against mold and also as an alternative for chemical fungicides.

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Biography

The author is Professor, researcher, HDR. His specialty is the valorization and the use of plants and seaweed as a biocontrol agent in phytopathology. He defended his thesis in 1992 at Paul Sabatier University in Toulouse. France. She has published more than 21 articles, 20 conferences and one patent. Score researche gate is 12.68.

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Valorization of fish waste oil
Monitoring the effect of temperature on the quality of refined fish waste oil during discoloration

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Abstract

Fish oils (sardines and mackerel) are rich in unsaturated fatty acids (65%), but the refining process has a negative effect on the double bond of the unsaturated fatty acids. This study aims to develop a better fish oil refining process. The material used in this research was to fish oil as a byproduct of the fishmeal industry. .The oil was purified in three steps, degumming, bleaching and neutralization. The last step was performed three bleaching temperatures: 50 ° C, 90 ° C and 120 ° C, using the Tensil 210FF as adsorbent. The study showed that the refined oil to a temperature between 50 ° C to 90 ° C gave a better value of free fatty acids, peroxide index, anisidine number

Biography

Specialized in the manufacture of fishmeal and fish oil, doctoral student he is a member of the team materials catalysts and valorization of the natural resources of faculty of sciences of Agadir .title of master in chemistry and science and technique of environment in 2012 faculty The objective of the team is the valorization of fish oil through refining, and the refining effect on the chemical, nutritional and sensory quality of fish oil.

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A theoretical study of the nitration aromatic substitution reactions of thymol and carvacrol

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[2] Cadi Ayyad University, Faculty of Sciences Semlalia, Laboratoire of BiomolecularChimistryNatural Substances and Reactivity (URAC 16), BP 2390, Marrakech, Morocco

Abstract

The aim of this work is a detailed theoretical study of the nitration aromatic substitution reactions of thymol and carvacrol. In this process, a mixture of concentrate nitric and sulfuric acids is used to produce the nitrating agent NO_2^+. It acts as an important tool for medicinal chemist to develop a newer compound possessing the thymol and carvacrol moiety that could be better pharmacophore in term of efficiency for drug discovery. In our study we looked at the action of a stoichiometric quantity of reactants.

The calculations were performed at the Gaussian 09 [1] using the DFT [2] approaches, the first task of the computing work was to determine the optimized geometry of the compound using the Becke three-parameter hybrid exchange functional and the Lee-Yang-Parr correlation functional (B3LYP) with the 6-311+G(d, p) basis set [3, 4]. Geometry optimization calculations have been carried out to obtain the global and local minima for reactants and intermediates, respectively, and to locate the saddle points for the transition states. The vibration frequencies have been calculated in order to check the character of the stationary points obtained after the geometry optimization. It is expected only positive frequencies for reactants, intermediates and products, and only one negative frequency for transition states.

The analysis of the nucleophilic f_k^- Fukui Function [5] and P_k^- Parr functions [6] (fig.1) allows characterising the C_4 carbon atom as the most nucleophilic centre of thymol and carvacrol, in clear agreement with the regioselectivity found. Calculation of activation energies, analysis of the potential energy surface and the Gibbs free energy G indicates that it takes place through a two-step mechanism. The thymol and carvacrol nitration is thermodynamically and kinetically favored in good agreement with experimental observations [7].

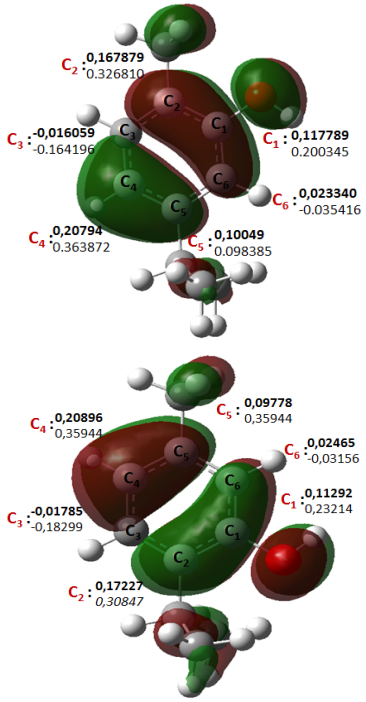

Fig1 :*The nucleophilic f_k^- Fukui function and P_k^- Parr functions of thymol and carvacrol*

Keywords: Conceptual DFT; frontier molecular orbital theory; reactivity index; Transition state theory.

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Germination test of some turfgrass species used in the green sites in eastern Morocco

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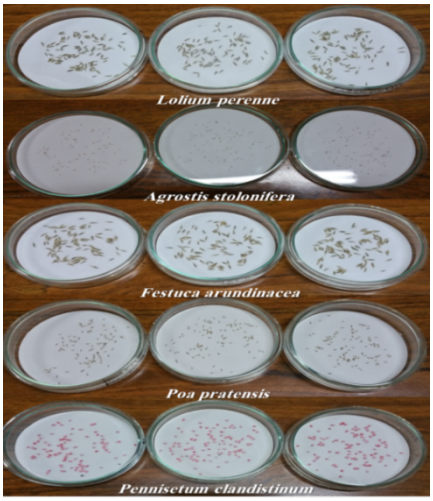
Abstract

Being the main constituents of lawns, turfgrass species have been the subject of numerous studies, particularly on their behavior. But if the literature is full of tests carried out under conditions of temperate climate, the knowledge on the behavior of these species in the particular conditions of Morocco remain very limited if nonexistent. The present work is a contribution in this direction. It aims to study the behavior of grass grasses in order to determine species resistant to edapho-climatic conditions in the eastern Morocco. Thus, a first test was conducted to determine *in vitro* the germination rate and kinetics of five species: *Pennisetum clandestinum, Lolium perenne, Festuca arundinacea, Agrostis stolonifera* and *Poa pratensis*. The results obtained showed that the percentage and the germination speed of differ according to the species studied. In fact, *Lolium perenne* showed the shortest germination time with a germination rate of 92% in 7 days. Germination peaks after 9 days for the species *Festuca arundinacea* and *Agrostis stolonifera*with a percentage of 99% and 89% respectively, and at the end of the 10th day for *Pennisetum clandestinum*of 80%.*Poa pratens* is had the lowest rate, 61% after a 30-day period.



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Biography

Khadija CHARIF, AIN BENI MATHAR, Master degree in Horticultural and Landscape Engineering in 2016 - Faculty of Sciences of Oujda, PhD student, Laboratory of the Plants Biology and the Microorganisms, Faculty of Sciences, University Mohammed first, Oujda, Morocco.

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Morpho-physiological and biochemical responses of Rosemary (*Rosmarinus officinalis*) to salt stress.

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Abstract

Salinity is a limiting factor affecting agricultural production on a global scale, particularly in arid and semi-arid regions. It is estimated that more than 800 million hectares of land in the world are affected by salinity. In Morocco, a large part of agricultural regions are affected by the soil salinization process. Currently, nearly 5% of the land is already affected by salinization at different levels.

In the context of exploring the effect of salinity on the physiological, morphological and biochemical behavior of the plant, we are interested in *Rosmarinus officinalis* in view of its medicinal, aromatic and socio-economic interests in order to evaluate his tolerance to salts by applying four saline treatments: 0, 2, 5 and 8 g / l of NaCl.

The tolerance of Rosemary to salt stress was discussed in this study and showed that this species is relatively tolerant to salt stress at moderate doses, but also the addition of salts at high concentrations may affect delicate balance between production and exclusion of salts.

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5 Daroui, E. A., Boukroute, A., Kouddane, N. E., & Berrichi, A. *(2013).. Nature &Technology,* (8), 32A.

Biography

PhD student at Laboratory of biology of plants and microorganisms - Department of Biology - Faculty of Science - Oujda, working on optimization of the production of medicinal plants and the effect of the abiotic stresses on the essential oils content and their chemical compositions.

Production: article published on JMES, oral communication at ICMES 2016 and 3 articles as co - author.

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Optimization of microwave-assisted Soxhlet extraction of polyphenols, flavonoids and tannins obtained from Moroccan pomegranate peels: Modeling and optimization of the process using the response surface methodology RSM

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Abstract

Response surface methodology (RSM) modelling are used for estimation of predictive total polyphenols content (TPC), total flavonoid content (TFC) and total tannin content (TTC) obtained from Moroccan pomegranate (punicagranatum) peels. A 3-level 3-factor central composite design was used to optimize microwave-assisted Soxhlet extraction (MASE) to obtain maximum yield of target responses as a function of extraction time (t: 15–35 min), solvent composition ethanol:wather (C: 10–30%) and microwave power (P: 400–800 W). Maximum compounds of the three output parameters: 375,77 mg gallic acid equivalents/g dry weight TPC yield, 162,96 mg rutin equivalents/g dry weight TFC yield, and 322,97 mg gallic acid equivalent/g dry weight TTC, were obtained under optimum extraction conditions of 35 min t, 24% C, and 600 W P for the TPC and 25 min t, 30% C, and 800 W P for the TFC and finally 15 min t, 30% C, and 800 W P for the TTC. For each experiment, the total polyphenolic contents, the total flavonoid contents and the total tannin contents were quantified using colorimetric essays. A significant effect of power extraction and solvent composition was proved by ANOVA. The extract was characterized by reverse phase high pressure liquid chromatography (RP-HPLC). RSM applied in MASE, permitted to develop a solvent-less extraction process of polyphenols, flavonoids and tannins, using lower proportion of a green solvent with a shortest time extraction and in the same time to improve the quantity of extracts obtained from a natural resource.

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Biography

Authoris a PhD student 2[ed] year, he has an expertise in design of experiments DOE, and he study the evaluation of inhibition efficiency of different extracts from natural resources.He work as a technician in a Chemical laboratory of the University of Cadi Ayyad, Marrakech, Morocco.

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Study of chemical composition and antibacterial activity of Moroccan *Thymbra capitata* essential oil and its possible use in orange juice conservation

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Abstract

Orange juice is one of the most famous and consumed juice due to its high ascorbic acid content, its high nutritional value and desirable sensorial characteristics. The intake of orange juice has shown different advantages on human health[1].The consumers demand of food naturally preserved caused the increase of research on alternatives like essential oils that are able to control pathogenic bacteria growth[2,3,4].*Thymbra capitata* essential oil (TCEO) has been used as traditional preservative in a wide variety of food but only few researchers studied experimentally its ability to be a food preservative[5].To the best of our knowledge, no researches have been published on the use of Moroccan TCEO in orange juice conservation. The aim of this study was to investigatethe composition and antibacterial activity of Moroccan TCEO and to evaluate its activity against three pathogenic bacteria in orange juice during 30 days storage at 20 and 5°C. TCEO was obtained by hydrodistillation of the aerial part of the plant. The chemical composition was analyzedby GC/MS.The diffusion method and the micro titration assays were used to evaluate TCEO antibacterial activity against *Escherichia coli* O157:H7 CECT 4267, *Listeria monocytogenes* CECT 4032 and *Staphylococcusaureus* CECT 976.GC/MS analysis showed that the main constituent of TCEO was carvacrol (75.52 %). TCEO showed an antibacterial activity *in vitro* against the tested pathogenic bacteria. In orange juice, TCEO was able to inhibit the growth of all pathogenic bacteria at both storage conditions. It can be concluded that Moroccan TCEO can be a promising natural alternative for pathogens inactivation in orange juice.

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Biography

Charfi has been studying essential oils for over seven years. Her PhD work concerns the study of Moroccan essential oils activities (antibacterial, antioxidant). Her focus is on the use of these essential oils in food preservation and specially in juice. Her work was presented in serveral national and internation events.

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Comparative study between two plants exported from Madagascar (*Cinnamomum zeylanicum* and *Eugenia caryophyllus*): antioxidant and antibacterial activities

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[3] Applied Organic Chemistry Laboratory, Sciences and Techniques Faculty of Fez, Sidi Mohamed Ben Abdellah University, Imouzzer Road, Fez 30000-Morocco.

Abstract

Essential oils extracted from Aromatic and Medicinal Plants have been widely used in food and perfume industries. Africa is one of the richest continents in floral biodiversity in the world because of its geographical spread. It's estimated to contain almost 40 000 - 45 000 plant species. *Cinnamomum zeylanicum* (cinnamon) and *Eugenia caryophyllus* (clove) are two plants exported by Morocco andhave a wide range of application, especially in traditional cuisine. The purpose of this study was to determine the antioxidant and the antibacterial properties of *C. zeylanicum* and *E. caryophyllus* essential oils imported from Madagascar. The bacterial inhibiting activity was evaluated against 3 bacterial strains isolated from foods and 4 bacteria referenced ATCC using agar-disc diffusion and broth macrodilution methods, while the antioxidant effect was assessed by DPPH assay. The results of the cinnamon essential oil prove that the disc diffusion method shows an important antibacterial activity against all tested bacteria with inhibition diameters between 29.66±1.7 mm for *Pseudomonas putida* isolated from food and 77.66±3.8 mm for *Pseudomonas aeruginosa ATCC*. The Minimum Inhibitory Concentration (MIC) was equal to 1.25 µL/ml and the Minimum Bactericidal Concentrations (MBC) were between 1.25 µL/ml and higher than 80 µL/ml. Regarding the clove results, the inhibition zones were between 14.6±1.7 mm and 35.6±2.7 mm for *pseudomonas putida* and *Pseudomonas aeruginosa ATCC*, respectively. The MICs were between 1.25 and 10µL/ml and the MBCs between 5µL/ml and higher than 80µL/ml. The test of the antioxidant activity revealed a very important activity with IC_{50} of 1.1 for *C. zeylanicum* and 1.8 µL/ml for *E. caryophyllus*, which are close to the BHA with an IC_{50} of 0.7 µL/ml. The present study demonstrates the potential usefulness of the 2 essential oils as antibacterial and antioxidant agents that can be cultivated and acclimated in Morocco to be exploited in pharmaceutical and food industries.

Key words: Madagascar, *Cinnamomum zeylanicum*, *Eugenia caryophyllus*, antioxidant, antibacterial, essential oil.

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VARIATIONS IN ORGANICAND MINERALCONTENTS OF FIVE *Lavandula* SPECIES FROM MOROCCO

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Abstract

Aromatic plants are presently widely studied and used for their large therapeutic potential and benefits as natural preservatives. *Lavandula* gender is a powerful aromatic and medicinal herb. The plant is used in traditional and folk medicines in different parts in the world for its antibacterial, analgesic and anti-inflammatory activities. It is also used for the treatment of several gastrointestinal, nervous and rheumatic disorders. *Lavandula Stoechas* L. of *Lamiaceae* family is therapeutically very important. The various studies tell that it contains organic, inorganic substances and essential oil.

The mainly aim of this work is to study the organic and mineral composition of *Lavandula Soechas* L. collected in various areas of Morocco.The essential oils (EO) of five *L.Stoechas*were isolated by hydro-distillation and the analyses were done on gas chromatography –Flame IonDetector (GC/FID) and gas chromatography – mass spectrometry(GC/MS). Mineral content were determined by Inductively Coupled Plasma – Atomic Emission Spectrometry (ICP/AES). The essential oil production representing yields from 1,29% to 1,85 % (w/w).The main chemical constituents of the essential oil are cineol 1,8, fenchone and camphor.All materials contained high amounts of essential plant nutrients (Ca, Fe, K, Mg….), and showed the presence of heavy metals (Cd, Co, Pb….). The most abundant was phosphor (65.22% of the total minerals). Sodium and calcium were the next most common elements (10.25% and 9.06%), followed by magnesium, aluminium and zinc.

The results indicate that the essential oil compositions in this study are very similar. The plants are rich of beneficial substances for human healths buttheir useshould be controlled to avoid the toxicity of heavy metals.

Keywords : *Lavandula*, organic content, mineral composition, GC/FID, GC/MS, ICP/AES.

Biography

Ahlam SAYOUT was born in Marrakesh city (Morocco), in 1992. She is a PhD student inapplied organic chemistry laboratory, Faculty of Science Semlalia, University Cadi Ayyad Marrakesh, under the supervision of professorAbderrahmane ROMANE.

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Characterization of Moroccan raw and processed caperberries

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Abstract

Capparis spinosa is a perennial plant growing wild in various regions of the world, particularly in Mediterranean basin, it is best known for its edible buds (capers) and fruits (caperberries) with very important nutritional, medicinal and aromatic properties. The culture of the caperberries plays a very important socio-economic role in several regions of Morocco.

The purpose of this study was to determine nutritional, biochemical and dimensional properties of Moroccan raw and processed caperberries in different stage of maturation, collected from Fez region.

Results showed the richness of caper berries with proteins (29.31%DW) and lipids (5.3%). Our findings indicate that caper berries contains high amount of total phenolic compounds, total flavonoids and high levels of carotenoids(ca. 3mg/100g). The evaluation of the antioxidant activity by the DPPH test revealed a high antioxidant capacity. Moreover, small caperberries had higher, crude protein, phenolic compounds and flavonoids than the big one thereby showing their aptness for processing.

The significant amounts of these compounds confirm the nutritional and medicinal value of Moroccan caperberries.

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Biography

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Effect of crop season on the quality and composition of virgin olive oils from Greek and Spanish varieties grown in north-eastern Morocco

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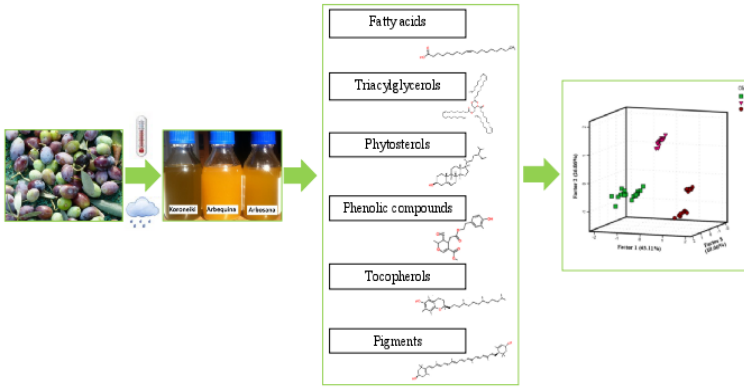
Abstract

This study aims to evaluate the variations in the quality and composition of virgin olive oils of Spanish (*Arbequina* and *Arbosana*) and Greek (*Koroneiki*) varieties produced in north-eastern Morocco, taking into consideration the influence of crop season. To this end, serval parameters were evaluated, such as quality indices, fatty acids, triacylglycerols, minor compounds (phytosterols, phenolic compounds, tocopherols and pigments) and oxidative stability. The results obtained in this study indicate that the majority of the studied parameters, with the exception of phytosterols, are influenced by climatic conditions of the crop season ($p < 0.05$).Additionally, the majority of the studied parameters was also influenced by the cultivar factor ($p < 0.05$). However, the studied varieties produce an excellent oil quality with a chemical composition respecting the requirements recommended by the International Olive Council. The main variations observed on the analyzed olive oils between the crop seasons are those of antioxidant parameters, such as phenolic compounds and oxidative stability. Triacylglycerols and fatty acids are also influenced by the crop season's climatic conditions. Nonetheless, the behavior of the studied varieties towards climatic conditions is different. Furthermore, results of principal component and hierarchical cluster analyses show a good discrimination between varieties according to triacylglycerol, phenol and phytosterol data. These compounds seem to be an effective tool to discriminate between the varieties.

Keywords: Crop season, Extra virgin olive oil, Fatty acids, Oxidative stability, Phenolic compounds, Tocopherols, Triacylglycerols.

Graphical abstract



Biography

Farid Mansouri graduated from Mohammed First University, Morocco, in 2011 and obtained his Ph.D. in 2015 after writing an original dissertation in food chemistry supervised by Professor Ahmed Elamrani. He worked as a postdoctoral research in 2016 at Gembloux Agro-Bio Tech, University of Liège, Belgium. He has then joined the department of Biology of Mohammed First University where he is currently a research assistant to Prof. Elamrani. He has received several awards and scholarships. Thus, Mansouri he has contributed to several research projects with Prof. Elamrani, for example the project 1.6 "Gestion de la qualité des aliments cas de la viande de la race Ovine Bni Guil , labellisée IGP de l'Oriental du Maroc" supported by the Moroccan–Belgian cooperation. The author has co-authored 18 papers in international journals. His research interests are in the area of food chemistry, food quality and food technology.

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Isolement des souches de bactéries lactiques et détermination de leur effet antibactérien

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Abstract

Les bactéries lactiques (BL) constituent un groupe hétérogène de bactéries avec des implications importantes dans le domaine de la biotechnologie. Elle sont actuellement utilisés comme probiotiques, inoculants d'ensilage et comme intrants dans les aliments fermentés. Elles sont à l'origine de la production d'acides organiques, principalement l'acide lactique, et des biotes forts intéressant pour le bétail. Elles synthétisent même des substances antibactériennes.

Le but de la présente étude est la détermination de l'effet antibactérien de cinq souches de bactéries lactiques. Ces cinq souches ont été isolées à partir de quatre biotopes différents : lait de vache (BL1), lben traditionnel (BL2), l'orge au lait cru (BL3, BL4) et l'orge fermentée (BL5). L'isolation et la purification de ces souches ont été réalisées sur milieu MRS solide. L'identification des cinq souches est établie en se basant sur la détermination de leurs caractères morphologiques et biochimiques. Ces souches ont été évaluées pour leur pouvoir inhibiteur vis-à-vis de sept germes pathogènes et d'altération. Les résultats de cette étude montrent que ces souches possèdent un pouvoir inhibiteur important indiquant des potentialités très intéressantes pour leur application dans la lutte contre les microorganismes pathogènes. En outre, ces bactéries lactiques pourraient aider à concevoir de nouveaux produits par fermentation lactique pour améliorer les performances des animaux d'élevage.

Mots-clés : Activité antimicrobienne, Bactéries lactiques, germes pathogènes, Lait, Orge.

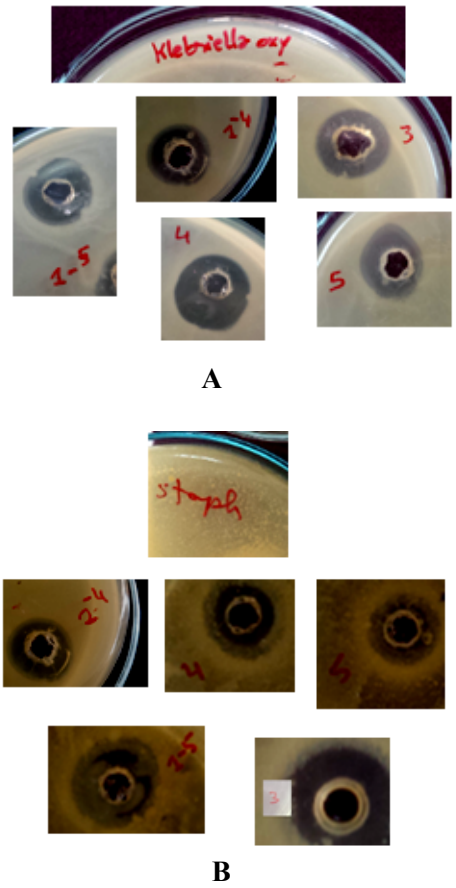

Figure : Activité antimicrobienne des souches lactiques BL1, BL2, BL3, BL4 et BL5 vis-à-vis de *Klebsiella pneumoni* (**A**) et *Staphylococcus Aureus* (**B**).

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Antimicrobialand antioxidant activities of two species essential oils growing in Medea (Algeria): Lentisque Pistachio (*Pistacialentiscus*) and Geranium rosat (*Pelargonium graveolens*)

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Abstract

Aromatic and medicinal plants are an important source of bioactive molecules, especially in volatile extracts. In this context and in order to isolate new compounds with potent biological properties we were interested in the extraction of essential oils of two species: Lentisque Pistachio (*Pistacialentiscus*) and Geranium rosat (*Pelargonium graveolens*) harvested in the El-ghzahra (Medea) region and obtained by hydrodistilation type Cleavenger (European Pharmacopoeia, 2008).

The chemical composition of essential oils studied was identified by gas chromatography coupled with mass spectrometry (GC / MS), The majority compounds are: αpinene (19,65%), myrcene (17,46%), β-caryophyllEne (16,15%), bornyl-acetate (14,49%), linalol (9%), Levomenol (8,73%), caryophyllene (6,98%) and Cyclohexene,1-methyl-4-(5-methyl-1-methyléne-4-hexenyl) (6 ,03%) for the essential oil of Lentisque Pistachio. However, the essential oil of Geranium rosat was characterized as having an important Geranyl acetate content (17,77%) followed by Linalol (14.81%), Geranyl tiglat (14,07%), Citronellol (11,85%), β-caryophyllène (11,48%), 2,6 -octadien-1-ol,3,7-diméthyle-acétate(7,40%), Isomenthone (6.66%), Butanoic acid (3,7%) and Levomenol (2,96%).The antimicrobial activitiy of essential oils studied were assessed using the paper disk agar diffusion method according to (IMELOUANE and *al*., 2010) with some modifications, against Gram positif bacteria and Gram negatif bacteria (*Escherichia coli, Bacillus subtilis and Staphylococcus aureus*), they are revealed sensitive to essential oils studied. Values determined for all the susceptible bacteria ranged between 22 mm and 45mm. A low activity of essential oils tested was evaluated towards *Candida albicans*.The antioxidant activity was measured using two tests: the trapping test diphenylpicrylhydrazyl radical DPPH (Sharma and Bhat, 2009) and determination of the reducing power FRAP (Oyaizu, 1986). The results show that essential oils tested have low antioxidant activity compared with antioxidants standards.

Pelargonium graveolens

Pistacialentiscus

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Screening and selection of new microbial anti-candidiasis

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Abstract

Candida albicans is a yeast-like fungus that can naturally colonize the skin, oral mucosa, intestinal tract and vaginal mucosa. Usually harmless and we do not find any pathological effect. It can become opportunistic pathogen, which causes many infections. *C. albicans* is the main causative agent of candidiasis, the most common form of mycotic infection.

The objective of this study is to search for new microbial inhibitors of *Candida albicans* in the environment. *Candida albican*s has been isolated and subcultured on Sabouraud-agar and malt-agar. The antifungal activity of the microorganisms selected was determined by the double layer technique, using 20µl of filtrate of isolated microorganisms. Among the microorganisms tested, an isolate gave a horiole of inhibition of 13 mm compared to the control.

Screening of *Candida albicans* antagonists

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Biography

Author focuses his goal the use of natural products and microorganisms to produce biological antifungals and have application in the field of health and the environment. Enrolled in doctoral studies in 2016 at the University of sidi Mohamed ben abdellah fes ..., morocco.*

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Moroccan invasive weed seeds survival during anaerobic digestion

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Abstract

The use of livestock manure and weeds biomass as feedstock for methanisation is of great importance in Morocco. Anaerobic digestion is mainly motivated by the aim of producing a renewable energy and a fertilizer-rich organic for agricultural soils, namely biogas and digestate. The use of livestock manure, crop waste and weeds as biomass for methanisation is not without a risk of spreading the seeds of certain weeds that are known by their invasiveness through the use of digestate in the fields as organic fertilizer. Several invasive weed species in Morocco have been reported including *Solanum elaeagnifolium* Cav., *Convolvulus arvensis*, *Chenopodium album*, and *Cynodondactylon*. These studies focused on their invasiveness and revealed their great ability to adapt and spread but also the difficulty of controlling them by conventional farming practices. Our study proposes anaerobic digestion as an alternative for weed control prior a safe use of by-products of methanisation (digestate) as a weed-free organic fertilizer. A decrease in the germination of the main weed species studied was highlighted.

Image

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Biography

Author has his expertise in treatment and recovery of waste and organic residues including biomethanation, organic farming and soil fertilization. Hisfocus is based onthe agronomic and phytosanitary parameters of anaerobicbiogas digestate. Hir H-index is 1 on Scopus.

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Cytotoxic Activity of *opuntiadillenii* extracts from Morocco

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Abstract

The cactus is the common name of plants of the family Cactaceae. It was introduced from Mexico in North Africa in the 16th century. *Opuntiadillenii* is a cactus belonging to the family of Opuntia.It is a xerophyte plant that usually grows in semi-desert regions, in tropical and subtropical regions. It has yellow flowers and red fruits. The Opuntia fruits have shown several effect such as antioxidant and antiulcerogenic agent, anticancer and hepatoprotective activities.

The present investigation was taken up to evaluate the cytotoxicity of *opuntiadillenii* extracts obtained from Essaouira in the South west of morocco. The skin of opuntiawas extracted by using different solvents: diethl ether, ethyl acetate, ethanol and pure water. Then the extracts were tested on three human cancer cells derived from: liver, colon and breast. Cells were treated for 72 h with increasing amount of each extract (from 0.1 to 0.5 mg/mL dry weight), and cell viability was tested by the MTT reduction assay, as an indicator of metabolically active cells. We found that extracts obtained with hydrophobic solvents (diethl ether and ethyl acetate) were able to kill human cancer cells, independently from the crop's origin, whereas no significant toxicity was observed with extracts obtained using ethanol and water. This effect may be ascribed to the presence of D-Limonene, a well-known anticancer agent.

Key words: *Opuntiadillenii* extracts, cytotoxicity, cell viability, D-Limonene.

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Ethnobotanical study of medicinal plants for cosmetic purposes in the Temara city (Morocco).

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Abstract

Many medicinal plants are at the origin of the traditional cosmetic recipes especially for the beauty, the cleaning and the natural care in general. This category of plant species still attracts many national and international scientific researchers. To this end, an ethnobotanical study, conducted in the Temara city, has brought together information on therapeutic care and established a catalog of cosmetic medicinal plants used by the local population.

Using 140 questionnaire cards, we collected 92 plant species belonging to 45 botanical families with a dominance of the *Lamiaceae* family which contains 11 species. Among the most used species are: *Olea europaea* L. *Syzygium aromaticum* (L.) Merr. & Perry and *Lawsonia inermis* L.

The analysis of the results obtained showed that most of the medicinal plants collected during our investigations are used in scalp treatments, facial and body treatments in general. Thus, we noted that among the respondents that infusion is the most common method of preparation and the leaf is the most used vegetative organ. Regarding the profile of the informant, our results showed that people using medicinal plants, in cosmetics and belonging to the age group above 60 years, have greater knowledge compared to other age groups.

The realization of these ethnobotanical surveys, allowed us to note that the medicinal plants occupy an important place in the cosmetics among the population of the Témara city in spite of the development of the modern cosmetology.

Key words: Ethnobotanical study - Medicinal plants - Cosmetic uses - Témara city.

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Biography

Author is a teacher at the Faculty of Sciences of Rabat Mohammed V University, since 2011. She obtained her PhD in 2008 from Mohammed V Rabat University (Morocco). His current scientific research focuses on the ethnobotany of medicinal, cosmetic, aromatic, food and toxic plants.

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Ex-situ conservation of medicinal flora: case of the botanical garden of Rabat (Morocco)

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Abstract

In general, and like all other plant species, medicinal plants are threatened by habitat transformation, overexploitation, uncontrolled gathering, pollution and climate change, some of which are now in extinction danger. To remedy this situation, the *ex-situ* conservation of this category of flora has become one of the priorities of Moroccan biologist researchers. For this purpose, an ethnobotanical study on the medicinal plants of the Botanical Garden of Rabat was conducted in collaboration between the ethnobotanists of the Biology Department of Rabat and the biotechnologists of the Rabat Garden of Trials. This study has enabled us to compile a catalog of a number of medicinal species of the Garden, of therapeutic uses and information concerning the origin of the species, the mode of propagation, the texture of the soil, diseases and diseases. parasites that face.

The analysis of the results obtained showed that *Lamiaceae* and *Apiaceae* are the families most represented by their number of species; that 40% of species multiply by seed, cuttings and divisions; about 80% of plants grow on many types of soil and aphids and scale insects can parasitize and attack 27% of the garden's medicinal flora. The results also showed that plants that treat diseases of the digestive system are the most dominant in the botanical garden of Rabat.

Finally, we hope that this work, on the medicinal plants of the Botanical Garden of Rabat, will serve as a model to follow to further study other existing gardens nationwide.

Key words: Ethnobotanical study - Medicinal plants - Botanical garden - Rabat.

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Biography

Author is professor at the Faculty of Sciences of Rabat, University Mohammed V with a career that exceeds thirty years. He supervised several students (PhD, Master, etc.) in specialty: plant biology and specially in ethnobotany plants (medicinal, aromatic, toxic, etc ...), in plant ecology and in floristry systematic.

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Extraction by maceration of natural organic dyes from 3 types of plant material traditionally used as a dyestuffin textile and leather tanning: IR Spectroscopy Analysis

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Abstract

The revolution of the chemical industry, the synthesis of new and different class of pigments at low cost with easy implementation ashort time of application, permit to the craftsmen to adapt with this type of leather tanning industry using inorganic and organic dyes such as (chromium sulphate, azo compounds, methylene blue...). The stability, persistent and pollutant character of the usedsynthetic moleculeslead to a drasticallyconsequences on the environment especially in the liquid effluents.It causes a toxicity, contamination and damage of the aquatic environment, and ecosystem (fauna, flora ...), and present arisk on the human health by developinga carcinogenic disease.

In order toreduce this type of environmental problems, and to resuscitate the ancestral artisanal culture of natural dyeing (tanning leather, textile), our choice fell on the valorization of natural pigments originated from 3types of plantmaterial. Theextraction by maceration method of the pigments were conducted on three types of plants (madder, pomegranate bark and mimosa),using 3 types of solvents with different yields.The natural extracted pigments present the particularity of non-polluting materials, less toxic on human life, ecologicaland environmental eco-friendly.

The IR structural analysis of the various extracts revealed that these pigments show different characteristic bands which justify the principal functions of our dyes.

By combining UV and FTIR techniques, we could suggest the presence of several pigments classes. Thus, the madder pigments (*red* color) may be attributed to anthraquinone class, while the pomegranate pigment (*yellow* color) corresponds to the flavonoid class. Finally, the mimosa extract (*brown* color) is of the dihydropyran-phenolic class.

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Biography

PhD student at the Faculty of Science and technique Fez working on the original dyes mineral and vegetable;impacts on the quality and physicochemical properties of animal fibers and on the environment

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Some Characteristics of Phosphate Solubilizing Rhizobacteria as an Ecological Strategy for Sustainable Agriculture

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Abstract

The development of biological approaches instead of chemical fertilizers is of great importance to assure a sustainable agriculture as well as a pollution-free environment. With the aim to select beneficial rhizobacteria exhibiting several plant growth promoting traits**,** this study characterizes5 phosphate solubilizing rhizobacteria.Diameters halos of P solubilization were between 0.4 cm and 0.9 cm, and P concentrations were between 66.83 and 339.39 mg l^{-1}.This bio-solubilization of tricalcium phosphate was accompanied by a drop in mediumpHto4.4. Three isolates, PP14, PP17, and RL90, could synthesize indole acetic acid, while PE66 and PE85were able to hydrolyze ACC. All these isolates were able to producesiderop hores and hydrogen cyanide except RL90and PP17. These isolates were evaluated also for extracellular hydrolytic enzymes production (chitinase, cellulase, amylase, lipase, and protease) and RL90 hasproven capable of solubilizing 2 substrates; carboxymethyl cellulose and proteins. These test bacteria were checked *in vitro* as well for antagonism ability against 4 fungal phytopathogens; *Colletotrichumacutat um*, *Phytophthoracinnamoni, Phytophthoracactorum*, and *Fus arium oxysporum*, and also against 3phytopathogenic bacteria; *Pseudomonas savastanoi, Clavibactermichiganensis,* and *Erwiniaamylovora*. All isolates were able to suppress at less one test fungus growth, and PE66 and PE85isolates showed an anti-fungal effect against all test fungi. For anti-bacterial activities, the best inhibition was obtained in the presence of PE85 against *P.savastanoi* and *C.michiganensis*. These results make some rhizobacteria, as RL90 and PE85, attractive as PGP bacteria. However, it requires further studies under pot culture as well as field conditions before recommending them as biofertilizers.

Keywords:antagonism ability, extracellular hydrolytic enzymes, rhizobacteria, HCN, IAA, P solubilization,(PGP) traits, siderophores.

Study in vitro of calcium oxalate crystallization in present nature product

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Abstract

We determined whether dietary restriction of calcium and oxalate, combined with medecinal plants treatment, would prevent stone formation and avert bone loss in vitro study.
Ten extracts of wild Algerian plants were, prepared daily just before handling by suspending a weighed amount of dry plant material in boiling tap water at room temperature. . The artificial urine was prepared immediately before use by mixing in a T-type mixing chamber. Mixture agitation was maintained to prevent sedimentation, Percentage of inhibition of crystallisation (I%) was calculated as previously described.
Extracts of plants used in this study was found to potently inhibit the nucleation, growth and aggregation phases of calcium oxalate crystallisation . *Ammodaucus leucotrichus* and *Ajuga iva* extracts demonstrated inhibition at all three phases of calcium oxalate crystallisation, while extracts of *Erica multiflora, and Globularia alypum* (flowers), inhibited nucleation and growth but not the aggregation of crystals. Our study demonstrates typical effects of the plant extracts on the various phases of calcium oxalate crystallization .Dietary restriction of calcium and oxalate, combined with medicinal plants satisfactorily controlled hypercalciuria, prevented the secondary increase in urinary oxalate, reduced urinary saturation of calcium oxalate, virtually eliminated recurrent stone formation, and increased bone density . This dietary pharmacological program controlled stone formation as well as bone loss that often accompany absorptive hypercalciuria. In vitro study.

Keywords: calcium oxalate, crystallisation, urolithiasis, treatment ,rehabilitation, bone

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Biological activity of the *Selvia officinalis* essential oil on *Varroa destructor* infested honeybees

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Abstract

The present work concerns the application of a treatment based on essential oil of the Sage *Selvia offinalis* on the Varroa destructor, major enemy of the honey bee *Apis mellifera*, in order to valorize the Algerian aromatic plants and to bring a alternative to chemicals. Pre-treatment results revealed infestation rates in the experimental site ranging from 3.76% to 21.22%. This shows the heterogeneity of infestations in hives according to the density of bees. This constitutes a difficulty in monitoring the population dynamics of this parasite. After treatment, a difference in the acaricidal effect of Sage essential oil is noticed. It gave a mortality rate of 6.09% by the dose D1: 5%, then that of the dose D2: 15% it gave 2.32% and a low mortality rate of 0.9% by the dose D3: 20%, the chemical treatment carried out by Bayvarol gave a result close to that of the essential oil of Sage (9.97%).

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Biography

Dr. Leila Bendifallah has more than 23 years of experience in plant protection, environment, biodiversity and apidology. Dr. Bendifallah is currently Associate Professor at the University of Boumerdes. She is a teacher-researcher at the university, M'hamed Bougara of Boumerdes; Faculty of Science since 2003. She is a head of Agronomic department. . She held the position of head of department for Studies and Research at the National Institute of Plant Protection (INPV) at El Harrach – Algiers from 1993 to 2003. She is Head of a research team: Biodiversity of the fauna and its interaction with its environment at the Research Laboratory of Soft Technologies, Valuation, Physical chemistry of Biological materials and Biodiversity. She published more than 30 papers. She is a head of several national projects. She expertises and comments submitted articles to national and international journals. Dr. Bendifallah is a president and Membership in the organizing and the scientific committees of National and International scientific events.

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Contribution à une étude des lipides totaux foliaires et des catégories lipidiques chez l'Oyat (*Ammophila arenaria*. L), plante des dunes littorales de la Méditerranée Orientale du Maroc

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Abstract

Ammophila arenaria (ou oyat), une *Poacée* typique des dunes littorales, colonise trois types de dunes : les dunes embryonnaires, les dunes mobiles et les dunes semi- fixées.
Les lipides totaux foliaires subissent des variations saisonnières quantitatives et qualitatives au cours de l'année. Sur le plan quantitatif le taux maximal est enregistré durant l'hiver et le printemps, le taux minimal en été et le taux intermédiaire en automne. Les faibles teneurs d'été semblent indiquer soit une adaptation du métabolisme lipidique au stress thermique (chaleur), soit une action néfaste du stress hydrique. Les fortes teneurs d'hiver, seraient une adaptation au stress thermique (froid) ce qui permet le maintien de la fluidité membranaire. Le taux lors de la saison du printemps correspond à la reprise de la croissance active et du développement végétatif et floral de la plante. Le taux d'automne correspond à une reprise de la croissance végétative (après l'arrêt estival). Sur le plan qualitatif la saison d'été est marquée par la phosphatidylcholine et la phosphatidyléthanolamine et la saison d'automne par l'individualisation du phosphatidylinositol et du diphosphatidylglycerol. Les saisons d'hiver et du printemps montrent plusieurs catégories lipidiques : la première saison est marquée par la monogalactosyldiacylglycerol et diphosphatidylglycerol alors que la seconde est marquée par la monogalactosyldiacylglycerol et la phosphatidylserine.

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Biography

L'auteur est professeur chercheur au laboratoire de Pharmacognosie (Faculté de Médecine et de Pharmacie de Rabat). L'auteur est aussi titulaire d'un diplôme d'agrégation en Sciences de la Vie et de Terre (SVT) et formateur en pédagogie et didactique des SVT. Il a des publications sur les dunes littorales touchant des aspects variés : botaniques, biologiques, physiologiques et écologiques.

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Evaluation of antioxidant and anticorrosion activities of extract of *Ammi visnaga*

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Abstract

The present work concerns the valorization of ultrasonic ethanolic extract of aerial part of *Ammi visnaga (2EAV*), as an antioxidant as mill as corrosion inhibitor of mild steel in 1 M HCl medium. The antioxidant activity is evaluated by two techniques; total antioxidant capacity (TAC) and free radical scavenging 2,2-diphenyl-1-picrylhydrazyl (DPPH). The phytochemical tests were carried out by to colorimetric reactions and precipitations which revealed an intense presence of tannins and flavonoïds. The content of total phenols, flavonoïds and condensed tannins were conducted by means of Folin Ciacalteu, Quettier-Deleu and Broadhurst methods, respectively. The results showed that 2EAV was highly much of polyphenols. The evaluation of the antioxidant activity showed that the extract had a significant capacity to reduce Mo (VI) to Mo (V) and to trap free radicals. The behaviors of 2EAV were followed by electrochemical impedance spectroscopy, potentiodynamic polarization, mass-loss measurements and surface analysis (SEM). Polarization curves indicated that 2EAV acted as mixed-type inhibitor and inhibition efficiency increased with 2EAV concentration. Impedance measurements showed that the double-layer capacitance decreased and charge-transfer resistance increased with increase in the 2EAV concentration and hence increasing in inhibition efficiency. The adsorption of the inhibitor molecules was in accordance with the Langmuir adsorption isotherm. The results obtained show that this extract exhibits an important antioxidant and anticorrosive properties. Furthermore, it is worth noting that the inhibition efficiency values, calculated from EIS measurements, show the same trend as those obtained from mass-loss measurements and potentiodynamic polarization measurements.

Figure 1: photography of *Ammi visnaga*

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Biography

Sarra Aourabi works on the valorization of natural substances as green inhibitors against metallic corrosion, since most of the organic inhibitors are toxic for human beings and the environment. She is in 3rd year at the doctoral cycle at the University Sidi Mohamed Ben Abd Lah, Faculty of Sciences Dhar El Mahraz. She has participated in several national and international congres, as well as in scientific days.

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Phenolic compounds in *Myrtus communis* and *Mentha suaveolens* extract - Antioxidant capacity and antiglycation activities

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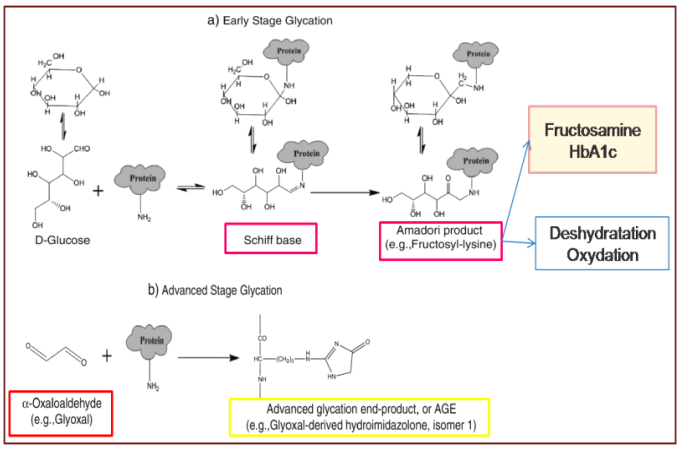
Abstract

Adverse effects induced by drug are scaring users who are turning to natural treatments such as medicinal and aromatic plants which are rich in bioactive compounds. The aim of this study was to select natural products capable of inhibiting glycation which is a non-enzymatic reaction between proteins and glucose or its metabolites resulting in toxic compounds. Different properties of *Myrtus communis* and *Mentha suaveolens* growing in the north of Morocco were studied, namely phytochemical characteristics, antioxidant and anti-glycation activities.For this purpose, the leaves of both species were extracted (water and methanol) leading to different polyphenol contents; the latters were depending on the solvent used. Furthermore, antioxidant activity was assessed by free radical DPPH scavenging, ferrous iron chelation and reducing power. On the other hand, the anti-anti-glycation activity was carried out on the BSA-methylglyoxal system by assaying Fructosamine. The results showed that the methanolic extracts presented the highest levels of polyphenols meanwhile the antiradical activity by the DPPH test revealed that all the extracts have a significant scavenging power. The aqueous extracts showed a very high reducing power especially in the leaves of *Myrtus communis*. Both plants showed high inhibitory activity of Fructosamine and advanced glycation products. These results obtained *in vitro* could be a first step to determine the components responsible for the so called activities, to isolate them and to test their possible effects against protein glycation using diabetic animal models.



Early phase and late phase of Glycation
(Figure adapted from Anguizola, 2013)

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Biography

Author has her expertise in evaluation and passion in improving the extraction method and plant used in popular medicine for diabetes treatment. Her focus is based on the use of natural resources to have application in health field. She was awarded her PhD in 2016 from the University of Abdelmalek Essaadi Faculty of Sciences and Techniques. She published more than 4 papers.

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Antioxidant Capacities and Total Phenolic Contents of *Thymus riatarum* from Morocco

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Abstract

Thymus riatarum (Family Lamiaceae) is a small aromatic perennial herb typical. This specie is used in Moroccan traditional medicine because of her medicinal and aromatic properties.

The aim of this study was to find antioxidant activity, flavonoid and total phenolic content of three extract of *T. riatarum*aeriel parts from Morroco.

The antioxidant activity was evaluated using five separate methods, inhibition of free radical 2,2-diphenyl-1-picrylhydrazyl (DPPH), measurement of total antioxidant capacity, ferricreducing/antioxidant power (FRAP) assays, Total phenolic, and flavonoid .

The ethanol extract were able to reduce the stable free radical 2,2-diphenyl-1-picrylhydrazyl (DPPH) with an IC_{50} value equal to 0.11mg/ml and showed an important total antioxidant , which was probably due to its high polyphenols content).

In general in the other test systems, ethanol and water extracts exhibited the strongest activity profiles. Especially, reducing power of water extract was found superior than those of synthetic antioxidants. However, flavonoids were determined in the highest level in ethyl acetate extract.

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Biography

Imane AOUAM is a Ph.D. student in the department of Biology studies from University Sidi Mohamed Ben Abdellah, Faculty of Sciences DharMehraz, Morocco.Her research focuses onvalorization of medicinal and aromatic plant and their different uses in therapeutic medicine.

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Biological Activities and Optimisation of Phenolic Extracts from Moroccan Lavender Obtained by Ultrasound Assisted Extraction

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[3]*Institute of Nursing Professions and Health Techniques of Fez (annex Meknes), Regional Health Directorate, El Ghassani Hospital, Fez 30000, Morocco.*

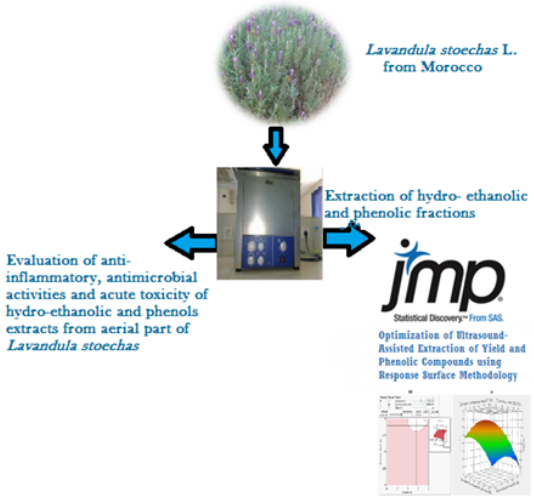
Abstract

The present work showed anti-inflammatory, antimicrobial activities and acute toxicity of hydro-ethanolic and phenols extracts from aerial part of *Lavandulastoechas*. Hydro-ethanolic extract was obtainedby Ultrasound Assisted Extraction method (UAE).The anti-inflammatory activity was evaluated by Carrageenan-Induced Rat Paw Oedema method and the antimicrobial activity of hydro-ethanolic and phenolic extracts was determined by disc diffusion essay and the macrodilution method.The effect of extraction conditions on yield and polyphenols contents by UAE was studied using Response Surface Methodology (RSM).

At dose of 10 %, *L. stoechas*produced a significant inhibition of inflammation at 74±7% compared to 69±10.3% for Diclofenac. Flavonoid and mucilage extracts showed significant effect in reduction of oedema. Furthermore, no renal, hepatic and blood dysfunctions were noted in treated animals.The flavonoids extract had the highest effect against bacteria's with MIC and MBC values ranging from 10 to 40 mg/mL and 20 to 80 mg/mL, respectively. The results also revealed that the hydro-ethanolic extract showed a MIC value at 80 mg/mL against all bacteria except *Acinetobacter-baumanii* and *Pseudomonas aeruginosa* ATCC.

The optimum extraction yield (31.68%) was obtained by ensuring the following parameters: an ethanol concentration of 40%, a liquid/solid ratio of 30 mL/g and 32.62 min as time processing. The maximum extraction of total polyphenols (190.61 mg Gallic Acid Equivalents (GAE)/g dry matter) was obtained using a process time of 20 min, liquid/solid ratio of 29.08 ml/g and a concentration of ethanol of 40%.

The results presented here suggest that the extracts obtained from Moroccan *Lavandulastoechas* possess anti-inflammatory and antibacterial properties without exhibiting any side toxic effect. The results indicated that the UAE-RSM approach was effective for maximizing the yield extraction and total polyphenols, and the knowledge gained from this study should be useful for further exploitation and application of the phenolic compounds.



Biography

Author has her expertise in phytopharmacology and phytochemistry. Her focus is based on the use of natural compounds to have application in health field such as: pharmacology and microbiology. He was awarded her PhD in 2017 from the University of Sidi Mohamed ben Abdellah, Morocco. He published more than 18 papers. Her H-index is 3 on Scopus

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Epidemiological study of nephrolithiasis in the eastern region of morocco

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Abstract

The lithias is a very common condition that affects 4-18% of the population according to studies; it is a real public health problem.

The objective of this work is to study epidemiological lithiasic adults of Eastern Morocco through adetailed epidemiological survey that will bring informations about the characteristics of nephrolithiasis, age, sex, diet, indicator signs of gallstone disease, family history…etc.

The epidemiological study that has been carried in the various regions of Eastern Morocco began in 1997. It consists on an inquiry about people suffering from kidney stones. The investigation has been carried by using a questionnaire of 19 questions that aims to address,to each affected adult, different informations in order to clarify the factors that could interfere orparticipatein a direct or indirect way to the formation of kidney stones.

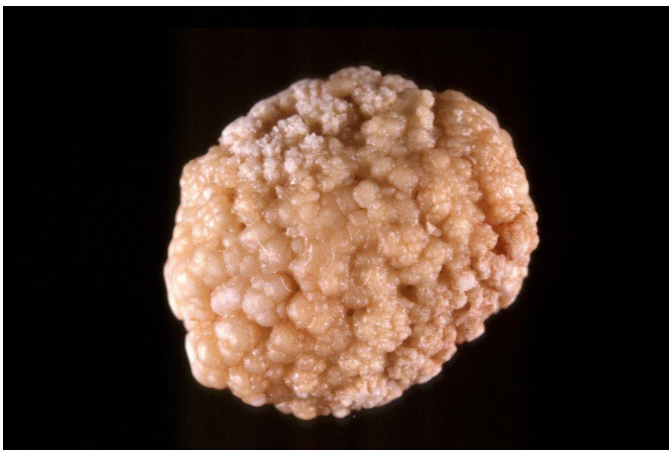
Note that in 1000 answered questionnaire, addressed to lithiasic people, only 864 were taken into account, the other ones were eliminated because their reports were incomplete.

Nephrolithiasis in adults is predominant among male adults and can affect at any age with a maximal frequency between 30 to 50 years.

Moreover, the majority of lithiasic people don't show other pathology associated to their disease (lithiasis), don't have a nephrolithiasis history, suffer from renal pain, and are characterized by a very high frequency of consumption of animal protein, dairy products, salty foods and soft drinks.

This work could serve as a basis for reflection to esteem the gallstone disease in Eastern Morocco, precisely nephrolithiasis among adults in this region.

Keywords: Epidemiology, EasternMorocco, Nephrolithiasis, Adults.



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Posters

First evidence of Anti-biofilm Activity of Propolis -Sahara Honeys (P-SHs) against Candidaalbicans

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Abstract

Sahara honeys (SHs) was applied as an antimicrobial in treatment for many infections in Algeria. Therefore, the present study aims to investigate the *in vivo* effect of SHs, against *C. albicans* biofilms when used alone or in combination with propolis (P)

To assess the efficacy of SHs, against *C.albicans*, Agar-well diffusion (AWD) and percentage of biofilm inhibition (PBI) was used to assess the antibacterial and anti-biofilm activity. Also, in this study we evaluated the synergistic effects of (P-SHs).

SHs (AWD mean = 10.5 mm; PBI mean = 7.14 %) and P-SHs (AWD mean = 6.33; PBI mean = 25.89). Propolis increased the anti-candidal effect (PBI) of SHs.In addition, the treatment of SHs and P-SHs catheters with a *C.albicans* biofilms reduced biofilm formation after 48-h exposure period.

The SHs and P-SHs application as a natural agent can be used as a prophylactic agent to prevent the formation of in vitro biofilm.

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Biography

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Development of an alternative strategy against varroa bee with the use of organic acids (oxalic acid) in Algeria

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Abstract

Varroosis is a very dangerous disease that affects honey bees, it is one of the most important threats of the Algerian beekeeping. There are several treatment methods: chemical, natural, biotechnical. Today, chemical control with strips containing pyréthriniode can only be used to a limited extent against varroa because these products are no longer optimal efficiency (resistant mites). And more intensive use of chemicals increases the risk of the presence of residues in bee products. So it seems interesting to turn to other means of natural control. Oxalic acid is one of those natural products that can present an alternative. This experiment aims to contribute to the development of the effectiveness of this organic acid of natural origin. Our study was conducted in an apiary of 45 settlements located in the Blida region. 3 doses were used by drips between frames of bee colonies. The oxalic acid treatment has a varroacide effect which depends on the dose used. 50 g of oxalic acid solution has a higher efficiency compared to that of 40 g and 30 g. But it has a negative effect on the development of the colonies. It is also clear from our results that the efficiency is directly related to the presence of the brood at the time of the intervention. Therefore, its use requires monitoring of the colonies in order to identify this period can be very short. However the dose of 50 g caused a general weakening of colonies compared to other treatments.

Further tests are needed to optimize the formulation, dosage and concentration of this treatment in the arid region, and especially to highlight the most favorable period for the completion of treatment.

Biography

The author is a research professor in the Department of Agricultural Sciences, University of Boumerdes in Algeria, is a specialist in pathology and biology of the honey bee. He has about thirty publications in the field of the protection of the bee.

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Prospective study of food poisoning in the education sector in the city of Mohammedia in Morocco

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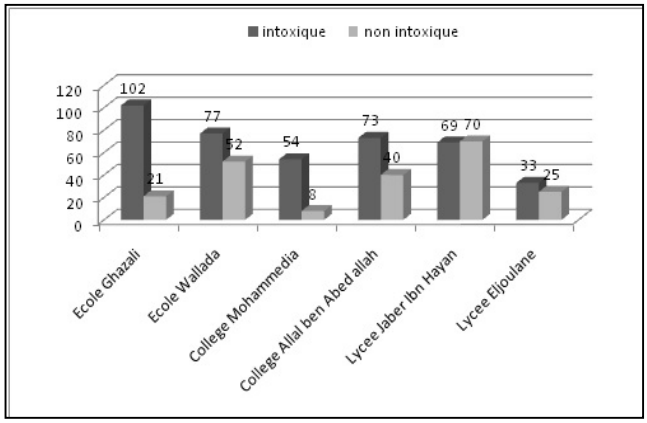
Abstract

Food safety is a scientific discipline, which ensures the prevention of food borne diseases by the handling, preparation and storage of foods. It includes a number of good hygiene practices, whichmust be respected in order to avoid the potential risks of serious diseases that food poisoning can cause. In this context we have conducted a study forward-looking in the objective is to describe the epidemiological profile of food poisoning among 606 pupils of primary, colleges and secondary schools located in the city of Mohammedia in Morocco. 389 poisoning cases have been detected on the overall sample of 606 students, the sex-ratio (F/M) was 1.04 .The age group most affected is between {6-11} years among M (71%), and {12-15} years among F (73%).The majority of poisonings occurred outside the home (79%). Clinical signs, the most observed were mainly digestive signs (68%), followed by signs headache (28%), ocular (2%).The majority of cases poisoned have received a symptomatic treatment (92%). According to the seasons summer is the period where the food poisoning are higher (51%), followed by the fall (20%), the spring (15%) and (14%) for the winter. The development of the cell for the epidemiological surveillance of food poisoning and the installation of a cell of quality assurance are the strong points of the mastery of the epidemiology of food poisoning.



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Biography

PhD student in the Laboratory of Genetics and Biometry, Faculty of Sciences, University Ibn Tofail, Kenitra, Morocco, my subject entitled "Study of the epidemiological profile of food poisoning among students in the region of Mohammedia, prospective study", areas of competence: Epidemiology; bio-statistics; analysis and management of data.

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Rosmarinus eriocalyx as a natural source of bioactive compounds

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Abstract

In an extensive search for bioactive compounds from plant sources, the composition of different extracts of R. eriocalyx stems, leaves and flowers collected from individuals spontaneously growing in North-East Algeria, was studied.
The qualitative and quantitative characterization of rosemary (Rosmarinus eriocalyx) samples, obtained by two different solvents, i.e. water and ethanol. After 24 h extraction under magnetic stirrer, was determined by high performance liquid chromatography coupled to Diode-Array Detection (HPLC–DAD).
A higher content of total polyphenols was found in the ethanolic extracts, the leaves were the richest part, followed by flowers and stems. On the other hand, aqueous extracts of R. eriocalyx showed a significant lower level of polyphenols in all parts, The major compound present in the ethanolic extracts was rosmarinic acid, that instead was present in poor amounts in the water extracts. The same trend is showed by carnosic acid in ethanolic extracts and carnosol in ethanolic extracts. Leaves were the richest part in terms of rosmarinic acid, carnosic acid and carnosol.

Keywords: *Rosmarinus eriocalyx*, Rosmarinic acid, HPLC/DAD, rosmarinic acid, carnosic acid and carnosol.

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Biography

Hamdi bendif Born in Alegria 1981,Dr. in phytochimical Caractérisation, valorisation, and détermination of the biological activities of actif extracts of some algerian lamiaceae.

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Valorization of fish waste oil.
The effect of temperature on the oxidation of refined fish oil and co unrefined

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Abstract

The valuation of fish sardine-products and mackerel the richest cash lipid> 8, which is defined as the unused parts and recoverable during traditional production operations, is an issue increasingly present because it allows to have a great economic interest. Indeed, co-products of the fish should be considered as alternative sources of raw materials for the production of substances intended for food, animal and human nutrition, cosmetics, dietary and health use (antioxidants, -stress, antihypertensive, collagens...).

Oils the products of the peaches because of its richness in mono fatty acids and / or polyunsaturated, are prone to chemical reactions such as isomerization and oxidation of fatty acids. The lipid oxidation is a complex set of reactions that occur in the presence of oxygen, leading to what is commonly called the oil rancidity. These oxidation chemical reactions are accelerated by a rise in temperature, a luminance of product or in the presence of metal ions which will react with the hydro peroxides already present in the oil to form oxidation initiating radicals.

The purpose of this study was to clarify a comparison of refined fish oil and unrefined stability in both conditions hot and cold. We also discuss the refining and the following process parameters: acidity, IP and IpA allowing us informed of the most stable oil quality during storage.

Biography

Specialized in the manufacture of fishmeal and fish oil, doctoral student he is a member of the team materials catalysts and valorization of the natural resources of faculty of sciences of Agadir .title of master in chemistry and science and technique of environment in 2012 faculty The objective of the team is the valorization of fish oil through refining, and the refining effect on the chemical, nutritional and sensory quality of fish oil.

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Chemical Composition and Oral Toxicity Assessment of *Anisophyllea boehmii* Kernel Oil from Burundi

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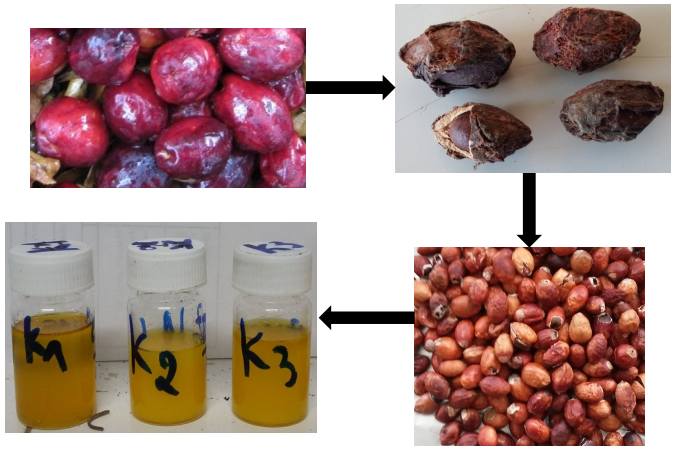
Abstract

Anisophyllea boehmii is an indigenous species to Burundi. Its fruits are edible and commercialized in local markets. The valorization of its kernel would contribute to optimize its nutritional and socioeconomic values. This study investigated chemical quality and composition and toxicity test of its kernel oil from two sites: Ruvubu National Park and Gisagara Protected Landscape in Eastern of Burundi. Results of the present study revealed *A. boehmii* kernels to be an oil-rich source, yielding up to 29% of oil. Fatty acid composition analysis classified these oils as palmitic. The main fatty acids were palmitic (36.47-39.55%), oleic (18.83-22.21%), palmitoleic (17.78-19.46%) and linoleic (12.97-15.40%) acids. The analysis of some minor compounds revealed high tocopherol (485-657 mg/kg), phenols (82-135mg/kg) and β-carotene (144-234 mg/kg) content. The oxidative stability evaluated by the rancimat method at 100°C reached 36 hours. Furthermore, the major of analyzed parameters seem to be influenced by genetic and geographic factors. Significant differences ($p < 0.05$) were detected between oil samples analyzed. Acute oral toxicity test revealed no toxicity of kernel oil of *A. boehmii*. These results are decisive in *A. boehmii* adoption as food resource



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Biography

Author has an experience in conservation of biodiversity by in-situ method “leaving well enough alone” and by domesticating species. He focus also on biological resource valorization such as Non-timber forest products by investigating chemical composition and valuing non-used or underused by-products. He was warded his PhD in 2017 from the University of Mohammed First Oujda, Morocco and he is actually Senior-Lecturer and Head of the Department of Biology, Faculty of Sciences at University of Burundi, Bujumbura. He published 4 papers among them 3 is indexed to scopus.

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Ethnobotany of Asteraceae medicinal and aromatic interest under grouping at *Pistacia atlantica* in the area of Bechar (Algeria)

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Abstract

The present work was carried out in the range of the grouping in *Pistacia atlantica* in the region of Bechar. The objective of the study is to evaluate and valorize floristic diversity of asteraceae of medicinal and aromatic interest with an ethnobotanical survey in socioeconomic and therapeutic relationship with the local population and their dynamics in relation to their use.

This distribution area of the *Pistacia atlantica* group is systematically characterized by the following floristic procession which consists of: 36 families, 97 genera and 127 species. It is dominated mainly by the Asteraceae family which is the most cosmopolitan with 26genres and 32 species.

The floristic diversity of asteraceae of medicinal and aromatic interest is represented by the abundance of species such as: *Anthemis stiparum, Atractylis delicatula, Artemisia herba-alba, Asteriscus pygmaeus, Anvillea radiata, Bubonium graveolens, Catanche arenaria, Calendula aegyptiaca, Carduncellus Devauxii, Carduncellus eriocephalus, Centaurea maroccana, Chrysanthemum fuscatum, Chrysanthemum macrocarpum, Cladanthus arabicus, Centaurea dimorpha, Echinops spinosus, Filago spathulata, Gymnarrhena micrantha, Ifloga spicata, Launaea arborescens, Launaea nudicaulis, Launaea resedifolia, Launaea glomerata, Matricaria pubescens, Onopordon acaule, Picris albida, Pallenis cuspidata, Picridium orientale, Scorzonera undulata, Spitzelia coronopifolia, Stephanochilus omphalodes et Senecio flavus.*

In general, the preparations commonly used on these asteraceae are infusion, maceration, herbal tea and decoction, to treat gastrointestinal disorders, respiratory, circulatory system, rheumatic pains, kidney stones, hemorrhoids, lung cooling, indigestion, emmenagogue , earache, dermatitis, sore, constipation, deworming, vulnerary, painful periods, healing, upset stomach and skin disorders (wounds, burns and abscesses).

In the light of this observation, it is imperative to put in place a vast program for the rational organization of the prospection, inventory and valorization of plant genetic resources at the local, regional and national levels. These natural resources constitute a potential food, medicinal, requires to preserve against all factors of disappearance and to include in the list of protected species.

Key words: Saharan Atlas, Bechar, Asteraceae, medicinal plants, *Pistacia atlantica*.

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Biography

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Biosorption of Cu(II) and Ni(II) ions from aqueous solution by Opuntia ficus-indica powder

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Abstract

Industrial effluents are the major sources of contamination of water resources by heavy metals. copper (II) and Nickel (II)aretwo of the toxic pollutants that can be present in wastewater. The main goal of this study was to evaluate the performance of cactus rackets (Opuntia ficus-indica) for the removal of Cu(II) and Nickel (II) from aqueous solution. The cactus rackets powder is characterized using different techniques (SEM,FTI,XRD). Batch experiments were performed as a function of various experimental parameters(adsorbent dose, pH, Copper and nickel concentration, contact time). The optimum conditions for maximum adsorption were attained at pH 5 and dose of 1 g/L for copper and pH 6 and dose of 1 g/L for nickel . The adsorption studies included kinetics. Kinetics studies showed better applicability for pseudo-second-order model. Overall, the results show the adsorption behavior of this biomaterial that can be used as a low-cost alternative to commercial materials.

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Biography

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Phenolic content and hydrogen peroxide scavenging capacity of some honey samples and propolis

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Abstract

Honey and propolis is a natural food largely used by local population for its medicinal properties. Honey is a sweet and flavorful natural product, which is applied as a remedy for burns, cataracts, ulcers and wound healing, because it exerts a soothing effect when initially applied to open wounds. Honey is characterized by its complex composition, which varies with the origin of the raw material as nectar or honeydew, the bee species, the edapho-climatic conditions, the available floral source and the storage conditions. Honey is produced by honey bees (*Apis mellifera*) and can contain over 200 compounds, being broadly comprised of sugars, amino acids, vitamins, minerals, enzymes, flavonoïds, phenolic acids. Another product bees is the propolis, known as the “bee glue”, which is a generic name that refers to the resinous substance accumulated by the bees from different types of plants. It contains more than 300 components, including phenolic aldehydes, polyphenols, amino acids, steroids, and inorganic compounds. Propolis has been indicated in traditional medicine as a way to promote health and enhance human resistance to infections or malignant affections. Several in vitro and in vivo studies and researches have documented that honey and propolis contain antioxidant substances and thus the potential of bee products to treat many diseases related to oxidative stress. In this context, our work aims to evaluate scavenging capacity of different bee products on hydrogen peroxide. For this purpose, honey samples, propolis and pollen grains were collected from Tlemcen province. The results showed highest values for the total phenolic content, total flavonoid content and a great hydrogen peroxide (H_2O_2) inhibition (IC50 between 0.205 - 2.210 µg/ml) for honey, while sample "all flowers" is the better antioxidant, more than ascorbic acid used as control.

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Biography

Author of a number of international publications, is an Associate Professor at the University of Mascara, PhD. in Cellular and Molecular Biology, specializing in the research of bioactive compounds and their biological activities.

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Antioxidant activity of two species essential oils growing in Djelfa (Algeria): wormwood (*Artemisia herba-alba Asso*.) and rosemary (*Rosmarinus officinalis* L.)

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Abstract

Currently, several questions are raised about the effectiveness and safety of chemical products used in the food industry. Indeed, because of the side effects of some synthetic antioxidants used in food processing. The development of new avenues of research to achieve alternatives seems indispensable. Recently, natural products from aromatic and medicinal plants represent a fertile ground for the development of novel antioxidant agents (Zu and *al*., 2010).

In this context and in order to isolate new compounds with potent biological properties we were interested in the extraction of essential oils of two species: wormwood (*Artemisia herba-alba* Asso.) and rosemary (*Rosmarinus officinalis* L.), harvested in the Djelfa region the month of April 2012. The yield of essential oils obtained by hydrodisstilation type Cleavenger (European Pharmacopoeia, 2008) is about 0.8 ± 0.05 (ml/100g) and 1.20 ± 0.01(ml/100g), respectively. The chemical composition of essential oils studied was identified by gas chromatography coupled with mass spectrometry (GC / MS), The majority compounds are: camphor (39, 5 %), chrysanthenone (10, 38 %) and 1, 8-cineole (8,6 %)for the essential oil of wormwood. However, the rosemary essential oil was characterized as having an important camphor content (39, 7%) followed by 1, 8-cineole (18,26%), the α-pinene (13,19%) and camphene (9,51%).The antioxidant activity was measured using two tests: the trapping test di-phenyl-picrylhydrazyl radical DPPH (Sharma and Bhat, 2009) and bleaching test of β-carotene (Tepe and al., 2004). The results show that essential oils tested have moderate antioxidant activity, relatively low compared with antioxidants standards.

wormwood (*Artemisia herba-alba* Asso.) and rosemary (*Rosmarinus officinalis* L.) essential oils growing in Algeria may be a potential source of natural antioxidant in foods in order to find possible alternative to synthetic antioxidant.

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In vitro study of the loss of efficacy of two fungicides under a range of saline solutions and residence period using bio-indicators

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Abstract

Large amounts of pesticides are used in Algeria due to different climatic pressures, pathological and physiological crop. To overcome the shortcomings of the treatments, including alkaline and saline hydrolysis witch remains the most important problems given the high pH of water and high salt concentration in the region underground water, farmers increase the dose of quarantine treatment or increase the frequency of these treatments which complicates the situation more and more. To study this phenomenon of saline hydrolysis and the effect of the period of stay of the active phytosanitary molecules in an aqueous formulation of two fungicides in wide use in our region. The bioindication methods used include that of the effect on the growth of mycelia. A saline solution range was chosen to meet the salt change of reality in our study area with a different range of periods of residence retained after the preparation of fungicide solutions maintained in laboratory ambient temperature 25 °C and the dark to avoid any photochemical reaction. From youth cultures of seven days, spores and mycelia were confronted with parameters respectively studied in a sterilized nutrient broth and agar PDA. On the other hand, a measure of mycelial growth in daily time and at the end of tested measuring the size of the fungi colonyfor each combination. ANOVA revealed very highly significant effects of the factors studied on the saline hydrolysis. The results we were allowed to check that the fungicides are rapidly degraded under different saline aqueous conditions.

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Alginate-mediated synthesis of silver nanoparticles using the brown seaweed *Laminaria ochroleuca*: structural features and antibacterial activity

Soukaina Kaidi[1], Zahira Belattmania[1], Fouad Bentiss[1,2], Charafeddine Jama[2], Mustapha Barakate[3], Chaimaa Katif[1,3], Abdeltif Reani[1], Brahim Sabour[1]

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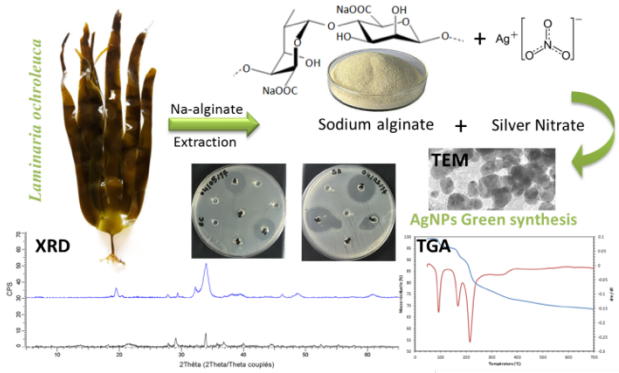
Abstract

The nanotechnology is one of the most attractive areas of research in modern material science. Particularly, nanoparticles are of great importance due to their possible applications in the promising areas of nanoscience and technology. In the present study, silver nanoparticles (AgNPs) were synthesized using sodium alginate extracted from the Kelp *Laminaria ochroleuca* harvested from the Atlantic coast of Morocco. The characterization of the synthesized silver nanoparticles was performed by UV-Vis spectroscopy, X-ray diffraction (XRD), transmission electron microscopy (TEM) and thermogravimetric analysis (TGA). The X-ray diffraction patterns proved the crystal phase of AgNPs with diffraction peaks at 2θ values 38°, 44° and 64°. The biosynthesized AgNPs were spherical in shape with average size around 20-25nm and they show a significant thermal stability. The *in vitro* antimicrobial activity of the sodium alginate silver nanoparticles revealed high antibacterial activity against the two tested human pathogenic bacteria *Staphylococcus aureus* and *Escherichia coli*. The use of Na-alginate from *Laminaria ochroleuca* seems to be interesting as environmentally friendly procedure for the synthesis of bioactive AgNPs.

Keywords: Silver nanoparticles, sodium alginate, *Laminaria ochroleuca,* synthesis, characterization, bioactivity.

Graphical abstract



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Biography

Soukaina Kaidi is a second-year PhD student in the Phycology Research Unit of the Faculty of Sciences El Jadida, where she is working to illuminate population genetics and the putative impact of climate change on the giant brown seaweeds *Laminaria ochroleuca* and *Sacchoriza polyschides* in the Atlantic coast of Morocco. She is also interested in sustainable and ecological harvesting of their biomasses with particular regards to the annual yields, spectroscopic and rheological quality of alginates and on de-alginated residues as biomaterials potentially usable in biotechnology and phyco-remediation. She was recently awarded by an Excellence Doctoral Scholarship (2016-2019) from The National Centre for Scientific and Technical Research (CNRST), Morocco. She co-authored until no one indexed paper and have tree papers under revision.

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Deliberate self-poisoning with pesticides in Morocco: results of a nationwide study

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Abstract

Suicide is a significant public health problem aroundthe world. According to WHO estimates for the year 2020 and based on curent trends, approximately 1.53 million people will die from suicide, and 10-20 times more people will attempt suicide worldwide. The aim of this study is to describe the epidemiological characteristics of deliberate self-poisoning with pesticides in Morocco.

This is a descriptive retrospective study of suicidal poisoning cases, reportedto the Moroccan Poison Control Centerover a 34-yearperiod from 1980 to 2013.

During the period of study, 7 422 suicide attempts by self-poisoning with pesticides including 400 cases of successful suicide were recorded. Nearlytwo-thirds of the cases (64.3%) were females with a female-male ratio of 1.8 and 5.1% were children under the age of 15 years. Most victimswere adolescents and young adults aged 15-24 years (55.5%). For this age group, the number of suicide attempts is 13.9 times higher than that for successful suicides. The averageage of the patients was 24.9±10.3 years. The poisoning symptoms were varied, depending on the types of pesticides, the route of exposure, the duration of exposure and the delay before treatment.

The easy availability of highly toxic pesticides through an unregulated open market has made pesticide self-poisoning the preferred suicide method with an extremely high fatality rate.

Water, Pollution and Environnement

Oral presentations

Seasonal Variability of the ocean mixed layer depth depending on the Cape Ghir filament and the Upwelling in the Moroccan Atlantic coast

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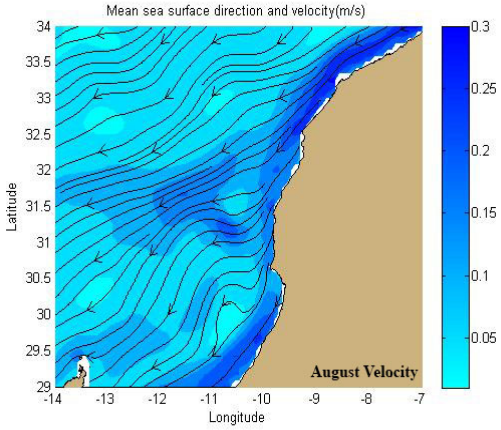
Abstract

The determination of the monthly variations of the ocean mixed layer depth (MLD), in relationship with the filament is important in a climate change perspective. To provide a better understanding of the relationship between filament and the monthly variability of the MLD variability in the region around cap Ghir 31°N in Morocco Atlantic coast, this paper presents monthly change of the mixed layer properties depth, temperature, salinity, oxygen and fluorescence. We compared the MLDs using the threshold method and the gradient method of temperature and density profiles CTD data. On the second-hand, the upwelling in the region was defined by the satellite data. In the other hand, we used monthly mean seawater velocity from Mercator model to identify the monthly filament direction. The in-situ mixed layer depth varies between ~20m in summer and ~150m in winter similar to the MLD of Mercator model. The deepest MLDs typically occur in December and February are with a weak Activity of the upwelling. For the period of April, June and August in general the mixed layer is near surface following the presence of filament. In October, the mixed layer was deeper following a persistent activity of the Upwelling.

Keywords: ocean mixed layer depth, filament, Upwelling, CTD Data, Satellite data, Mercator Model data.



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Biography

Bessa Ismail, PhD student at university Hassan II Casablanca, Faculty of sciences Ben M'Sik, Casablanca. I am studying the variability of the ocean mixed layer depth in relationship with the upwelling activity, sea surface temperature and Chlorophyll-a in the Moroccan Atlantic cost.

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Life cycle assessment in Manufacturing Process of a Headrest in Morocco

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Abstract

The Moroccan car industry has reached steady growth levels during the past decade. As a matter of fact, its performance is particularly remarkable in export and in terms of job creation. In consequence, Morocco has gained in competitiveness and quality by putting in place logic of ecosystems to promote the integration of the sector and insure better organization of its actors.

Rightly and to this day, five ecosystems have been set up concerning the sectors: car wiring, vehicle interior and seats, metal and stamping, automobile batteries, heavy goods vehicles (trucks) and finally industrial bodywork, engines and transmissions. The car seat manufacturing industry is of great importance, as the sector had more than 150 equipment manufacturers in 2014 mainly implanted in three regions: Tangier (43%), Casablanca (39%) and Kenitra (7%). %), and covered the core business for the production of high value-added vehicles. Headrest manufacturing industries for car seats is considered to be an essential component in the car seat that allows to maintain the driver's head or passenger. In other words, it represents the upper part of the car seat whose main function is to protect the head and upper spine in case of accidents.

In this context, the goal of this study is a life cycle analysis of an automotive headrest, in its overall manufacturing process. Modeling and data collection will give us the possibility to exploit a universal technique to be widely used to address the potential environmental effects which are associated with this product. By respecting the different phases of the ISO 14040 to 14044 standard and using the cut-off rule on different stages of production of a headrest. We have been able to identify the main impact factors on environment. Accordingly, the calculation of these different impacts according to the proposed methodology led to the conclusion that the manufacture of car seat headrests generates a pressure on the environment that can be evaluated with a view to generalizing this study to the manufacture of a head support all over the world.

Biography

Author has his expertise in the evaluation of the environmental impacts of an automobile industry manufacturing headrests for car seats. His focus is based upon looking at the best ways that can alleviate at least the possible chemical's effect on the environment. He is writing a doctoral thesis on the adaptation of LCA lifecycle analysis methodology for the evaluation of the impacts of industrial processes. He is following his doctoral cycle studies at Abdelmalek Essaadi University at the Faculty of Sciences and Technology in Tangier. He is doing scientific research, experiments and measurement in terms of assessing the potential repercussions of the manufacturing of headrests on the environment within some controlled conditions in a facility which is located at (AEU) Abdelmalek Essaadi University called Chemical Engineering and Resource Development Laboratory. He has been writing his doctoral thesis under the supervision of Prof. Dr. Mahacine Amrani

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Treatment of a dye and a textile rejection by adsorption on sludge from drinking water treatment

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Abstract

Textile rejects are complex mixtures which are stable and hardly biodegradable. These discharges constitute a real danger for humans and the environment because of their content of dye, organic matter with difficulty biodegradable, matter in suspension and salts. Methylene blue is the dye most commonly used in dyeing cotton and silk. Our work consists of the decolorization of methylene blue and the treatment of a textile discharge by adsorption on the sludge resulting from drinking water treatment. The adsorption tests carried out on Methylene blue showed a remarkable elimination from the first minutes. The effect of various experimental parameters such as particle size, adsorbent mass, pH, contact time, initial concentration of Methylene blue was investigated. The results of the adsorption kinetics are best described by the pseudo-second order model. The adsorption isotherms of methylene blue are satisfactorily described by the Langmuir model. Sludge activation improves their adsorbent capacity. The sludge adsorption treatment of textile rejects reduces conductivity by 82% and COD by 74%. This work has a double interest because it allows the recovery of a solid waste (sludge) for the treatment of rejections of the textile industry. Its purpose is to propose an efficient and simple method for the treatment of rejects.

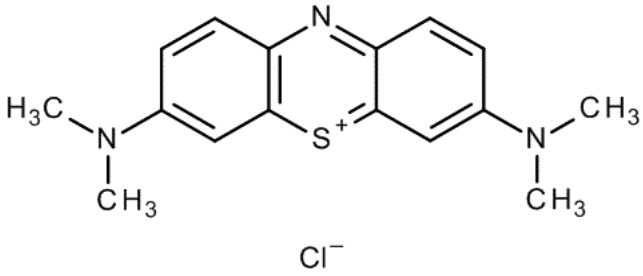

Figure 1 : Disposition dans l'espace de la molécule de bleu de méthylène

Biography

Hasna ELMONTASSIR doctorante au laboratoire de Géosciences appliquées à l'ingénierie de l'aménagement à la faculté des Sciences Ain Chock Université Hassan II de Casablanca, spécialisé en Chimie et Valorisation, elle s'intéresse plus particulièrement aux questions de Valorisation des déchets et au traitement des rejets. Elle est diplômée d'une licence en Aménagement et Gestion de l'Environnement et d'un master spécialisé en Eaux et Développement Durable. Elle a travaillé sur la gestion des déchets solides de la ville de Khouribga (Maroc), l'optimisation du fonctionnent des stations de potabilisation de la ville de Beni Mellal (Maroc) et sur la valorisation des boues hydroxydes.

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The thermodynamic study of the desulfurization process of phosphogypsum

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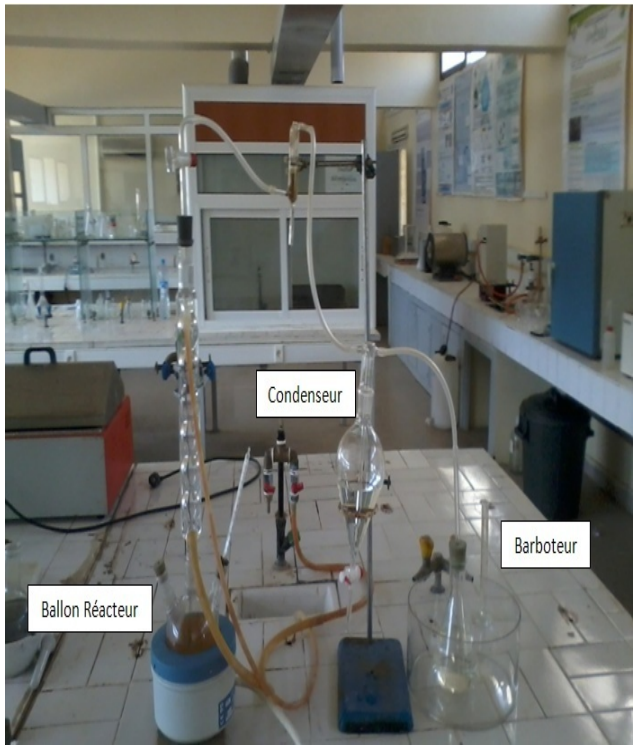
Abstract

Phosphogypsum (PG) or chemical gypsum is a byproduct generated in the manufacture ofphosphoric acid. The world production estimated to 200 million tons per year (Morocco 8 million tons per year) induces environmental threats and storage problems, which requires strict policies to limit pollution and encourage its valorization.

The purpose of this paper is to investigate the thermodynamic condition of desulfurization process of phosphogypsum (PG). Theoretical approach and experimental setup were validated by using the actual data from desulfurization of PG. Theoretical and experimental results showed chemical decomposition of phosphogypsum is thermodynamically feasible only at low temperatures using the HSC 6.1 chemistry software .



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Vulnerability of Alhodidah coastal wetlands in Yemen: main socio-economic causes

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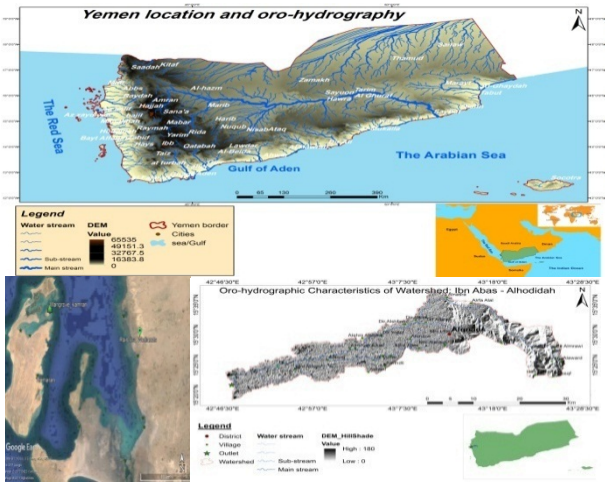
Abstract

Wetlands provide a lot of benefits to local people such as cultivation, recreation, education, timber production, etc. Yemen, like other countries in the whole world, has many threats to the aquatic biodiversity of wetlands as well as most of them are often under a regime of unsustainable human pressures. Several wetlands are loosed especially coastal wetlands due to many problems. Understanding of current situation could be identified strategies which are help ensuring the long-term conservation of wetlands. Thus ,the study aim is to present of socio-economic reasons of the coastal wetland degradation in Yemen in terms of the direct and indirect causes. Case study and interviewing various people (maker-decision, experts, practical coordinators and local people) were used to identify the reasons of wetlands degradation. The result shows that the livestock, agricultural production and salt mining, is the main socio-economic causes. Furthermore, the current activities such as tourism activities and agriculture near to coastal wetlands caused a threaten for wetlands. The conclusion shows that the awareness programs and classification should be the first priority for all stakeholders. Finally recommendations to guide decision-makers for could achieve the sustainable vision for wetlands.

Keywords: *Vulnerability, natural and human causes ,Coastal Wetlands, Yemen.*



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Biography

Author has more than fifteen years of experiences in water management and environmental protection. She has MSc degree about " Environmental Science and water resource management" from SAXION universities 2008 as weel as MSc on "Environmental Science" from Greenwich university in UK 2009. Also, she studying Phd- (fourth year)in Mohammed V. University in Morocco on "Wetlands Classification and Ecology" 2017. She will award her Phd in 2018. Afrah published about twenty two Academic Article and International country reports in many developed and developing countries.

She has attended many International workshops and conferences in Water, Gender, Agricultural and Environmental issues such as in Korea, Japan, France and Canada. She got some rewarding and honery certificates in her country during her work as general manger of development. Afrah volunteered as a member in many National (Yemen Engineering Syndicate; Environmental Protection Association) and International (GREPOM Bird in Morocco ; Renewable Energy World; and Society Wetlands Science) organizations.

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Electrochemical evaluation of novel imidazole derivatives as corrosion inhibitorsfor mild steel in 0.5 M H_2SO_4

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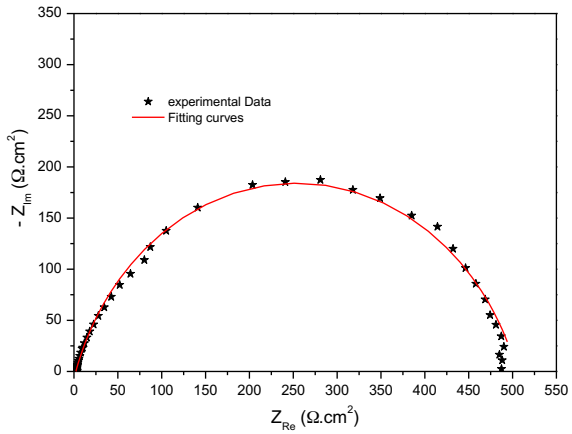
Abstract

Mild steel has been extensively used in several industrial processes due to its distinctive characteristics. However, they can unavoidably be corroded due to the harsh environment around them. Recently, using organic corrosion inhibitors is the most effective and economical approach of all anticorrosive methods. The corrosion inhibition performances of two imidazole derivatives for mild steel in 0.5 M H2SO4 solution were studied by potentiodynamic polarization and electrochemical impedance spectroscopy (EIS) techniques. Data obtained from EIS studies were analyzed to model inhibition process through appropriate equivalent circuit model. The results of the electrochemical methods showed that the studied molecules imparted high resistance and behaved as mixed type inhibitors. Both thermodynamic and kinetic parameters were calculated and discussed.The adsorption of the inhibitor molecules on mild steel surface was found to be chemisorption.



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Biography

Author has her expertise in Materials and Corrosion Science. He was registered her PhD in 2015 at Ibn Tofail University, Morocco. She published more than 5 papers. Her H-index is 1 on Scopus

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Electrochemical and theoretical evaluation of new imidazopyridine derivatives as a corrosion inhibitors for carbon steel in Hydrochloric acid solution

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Abstract

Every year industry pays a massive and rising cast for its corrosion problems .the use of inhibitors has a great practical importance, as they are extensively employed in reducing corrosion rate the corrosion inhibition of carbon steel by two derivatives of imidazopyridine in hydrochloric acid 1M has been investigated using electrochemical technique such as impedance spectroscopy (EIS) and potentiodynamic polarization. The polarization curves indicated that the compounds tested acted as mixed inhibitors the adsorption of tested molecules on the steel surface obeys toa Langmuir isotherm model. The temperature effect on the corrosion behavior of steel without and with inhibitors was studied in the temperature range from 298K to 328K .the adsorption free energy and activation parameters for the presence of benzo-imidazopyridine derivative were determined .the quantum chemical calculation based on DFT method's at B3LYP /6-31G **, level of theory were performed using Gaussian 09.The theoretical results are in goodagreement with experimental data.

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Biography

Rajae SALIM her expertise is in evaluation and investigation of corrosion materials. Her Focused is in the application of different inhibitorsin order to reduce the corrosion inhibition of materials caused by acidic solution. Studied her PhD in 2015 from the University IBN TOFAIL, kénitra. She published 5 papers. Her H-index is 2.

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Modelling of reactive pollutants dispersion in a street canyon

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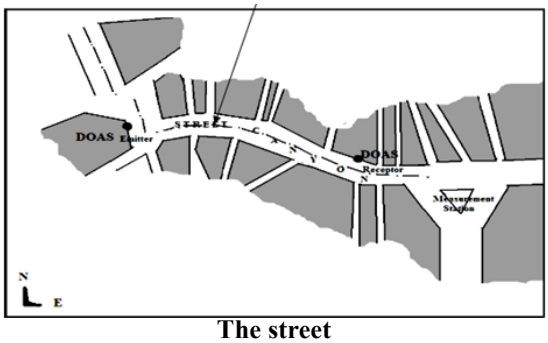
Abstract

Reactive pollutant dispersion in an urban street canyon 3-D is numerically investigated using a computational fluid dynamics (CFD) code (ansys-CFX), with the k–ε turbulence model and includes transport equations for NO, NO2, and O3 with simple photochemistry. An area emission source of NO and NO2 was considered in the presence of background O3 with an ambient wind perpendicular to the along-canyon direction. The results showed that the magnitude of NOx (NO+NO2) concentrations on the leeward side of the upstream buildings were much larger than the windward side of the downstream building, due to the entrainment and dispersion of traffic emissions by the primary vortex. The reverse is the case for ozone with higher concentrations on the windward side compared to the leeward side.
The model has been validated against no-reactive pollutant experimental data of the wind tunnel experiments of Hoydysh and Dabberdt, 1988 [18].



The street

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Biography

Author has her expertise in modeling and simulation of pollutants dispersion in urban areas, based on cfd codes ansys, TAPM. He was warded his PhD in 2017 from the University of USTO Oran, Algeria. he published more than 2 papers (indexing on Scopus).

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Contribution of the thermal infrared band in monitoring the spatio-temporal change in water surface temperature over the El Massera dam area between 1987 and 2008

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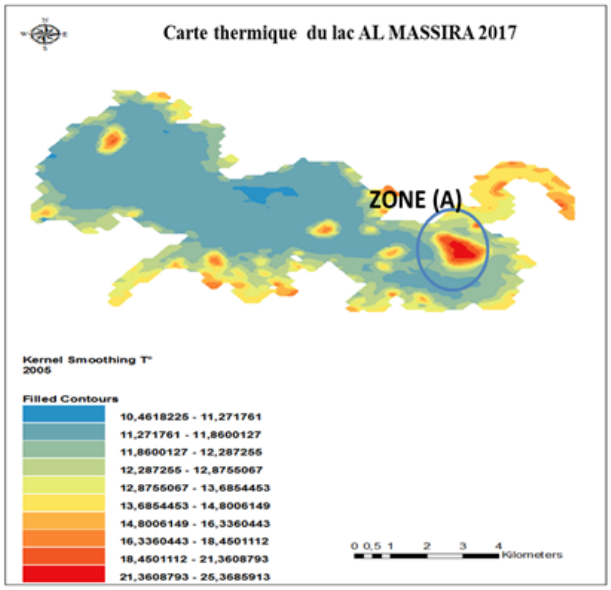
Abstract

Water remains an essential resource threatened in its quality and quantity. Despite the construction of new dams and the use of desalination, Morocco will record a water deficit by the year 2025. This is mainly due to the various natural and anthropogenic problems affecting these structures likely to capture the water retained. In this study we have shown the contribution of thermal infrared remote sensing to the spatio-temporal monitoring of the surface temperature of the water retained by the El Massira dam between 1987 and 2008. This study allowed us to obtain good results in form thermal maps on several dates, showing a gradual change in the temperature of the water surface since 1987. This thermal discrimination is found more precisely at the mouth of the dam, where the surface temperature had a small distribution in 1984. However in 2008 that she had become dominant on the same area of the dam. The superimposition of the existing bathymetric charts with the results obtained, allowed us to note that this significant increase in temperature is related in particular to the reduction of the depth of these zones, and also due to the bathymetric variations related to the siltation of the dam. This study of the thermal remote sensing informed us about the main technical problems that affect the quantity and quality of water dams. Particularly the siltation of the dam, which reduces its depth and causes a significant surface water temperature.



Keywords: EL Massira dam, remote sensing,GIS, Landsat 7 ETM +, thermal infrared band 6.

Biography

The PhD **A.AIt-ELGHAZI** is specialized in the field of remote sensing space. The objective of this thesis study is to evaluate the contribution of the Landsat thermal infrared band to the monitoring of spatio-temporal changes in lake surface temperature (study case AL Massira Lake). He obtained his Master's degree in GIS and Remote Sensing Space at the Faculty of Sciences of Ain Chock Casablanca Morocco.

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Synthesis, characterization and photocatalytic properties under visible light of doped and co-doped TiO_2-based nanoparticles

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Abstract

Currently, the main used water treatment technologies such as adsorption or coagulation merely concentrate the pollutants by transferring them to other phases without being completely destroyed. Advanced Oxidation Processes (AOPs) are innovative water treatment technologies. They are based on the in-situ generation of highly reactive transitory species (mainly OH•) for mineralization of refractory organic compounds [1]. Among the AOPs, the heterogeneous photocatalysis employing semiconductor catalysts (such as TiO_2, ZnO, Fe_2O_3, CdS and ZnS) has demonstrated its efficiency in degrading a broad range of pollutants at ambient temperature and pressure without generating harmful intermediates [2,3]. However, many of these oxides including TiO_2 are only photoactive in ultraviolet light, and the doping or co-doping with metal (Cr, V, Co, etc) and non metal (S, N, etc) is an important strategy to extend the photoactive zone to visible light [4]. In this work, TiO_2-based nanomaterials have been successfully synthesized by doping and co-doping of TiO_2 with transition metals (Cr, Co, Ni, Mn), and (Si, W) or (P, Mo), respectively. The structural, optical and morphological properties of the synthesized nanomaterials have been investigated using various techniques such as X-Ray Diffraction, Fourier Transform Infra Red Spectroscopy and UV-Vis Diffuse Reflectance Spectroscopy. The obtained results show that the doped and co-doped TiO_2-based nanomaterials are crystallized and exhibit high ability to absorb visible light. The obtained band gap energies change to below the band gap energy of TiO_2 anatase (3.2 eV) [5] indicating the absorption shifts to visible light. The photocatalytic activity of the as-prepared nanomaterials was then evaluated by measuring the degradation efficiency of methyl orange (MO) under visible light. The results show (figure below) that, under visible light, the materials are more efficient than the pure TiO_2.

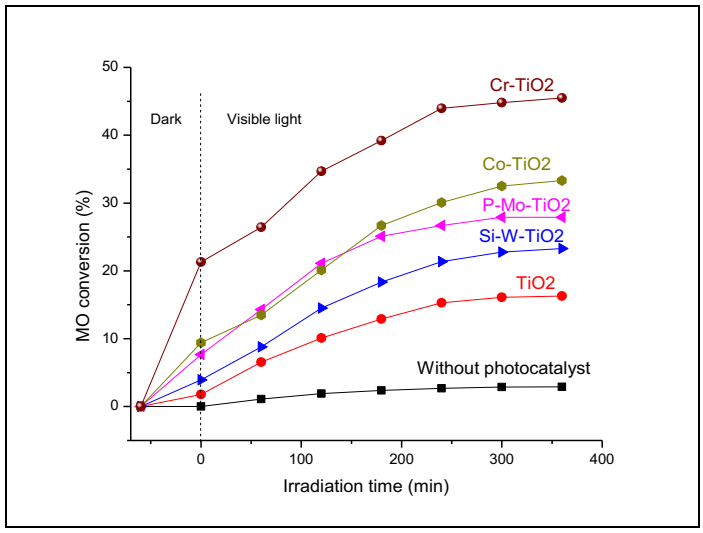

Figure: MO conversion of doped and co-doped TiO_2 under visible light. Photocatalyst dose = 0.5 g/L, $C_0(MO) = 10^{-5}$ mol/L

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Extraction and recovery of vanadium from acidic environments across polymer inclusion membranes containing one of the extractive agents: Tris (2-aminoethyl) amine or nitrilotriacetic acid.

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Project PPR2 (MESRSFC-CNRST)

Abstract

The recovery of vanadium from industrial acid solutions is important because of its relatively high concentration, thus representing an essential source of this metal, which has various industrial applications, such as in the production of oxidation catalysts for the manufacturing of sulphuric acid, in petroleum refinery, for catalytic cracking of heavy oil and in many industrial processes almost exclusively in ferrous and non-ferrous alloys and construction of batteries.

Membrane processes have become an important part of the technological processes of separation, extraction and recovery. They are used in several applications, including oriented processes through affinity membranes, as a new facilitated extraction process. In the present work we have developed and characterized two polymer inclusion membranes (PIMs), with polyvinyl alcohol (PVA) as a polymeric support and and the two extractive agents Tris 2-aminoethyl amine (TREN) and nitrilotriacetic acid (NTA). These PIM membranes have been adopted for the extraction and recovery process of VO_2^+ vanadium ions from liquid solutions with high acidity.

The experimental results make it possible to determine ***the macroscopic parameters***, permeability ***P*** and initial flux J_0, in order to elucidate the performance of each developed membrane. Similarly, the ***microscopic parameters***, K_{ass} association constant relating to the interaction of the substrate with the extractive agent and the apparent diffusion coefficient ***D**** relating to the migration of VO_2^+ ions (substrate) through the membrane phase, were determined. The analysis of the results makes it possible to elucidate for the studied process a mechanism by jumping of the substrate molecules from one site to another of the immobilized extractive agent in the membrane phase.

The results indicate that the TAN agent extractive is more efficient than its counterpart TREN, as well as, the structure and the nature of the interaction sites of the extractive agent are essential elements for good performance and good selectivity of the membrane.

Table: Parameters related to the performance of adopted membranes.

	T (K)	P_{moy} 10^7	D^* 10^5	K_{ass}	$J_{0\,moy}$ 10^5
PIM-NTA	298	31,55	3,32	0,74	0,67
	303	35,80	4,28	0,65	0,75
	308	44,39	5,96	0,58	0,93
PIM-TREN	298	17,43	0,34	1,37	0,50
	303	21,64	0,62	1,18	0,62
	308	24,44	0,70	1,00	0,70

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Biography

PhD student in membrane process in my 5th yaer, from the university of sciences Aîn chock, my passion in protecting the environnement made me focus on the extraction and recovery of heavy metals from chimical effluent and waste water.

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URBAN'S WASTE WATER ANALYSIS AND ITS EFFECT ON THE AREA OF "GREAT ORAN'S SABKHA"

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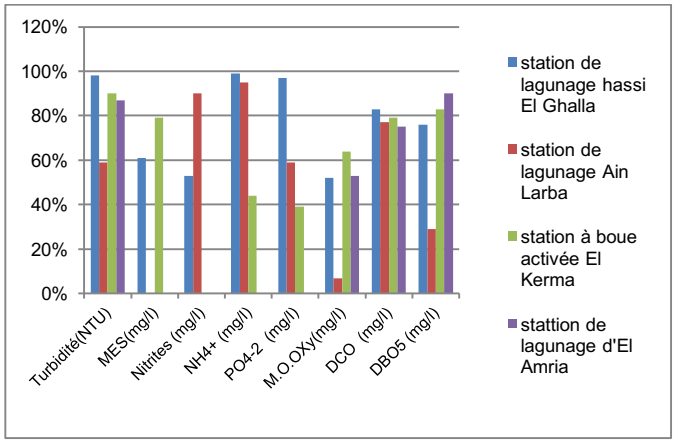
Abstract

In intermediate and long range time, the area of " Great Oran's Sabkha" is threatened by the untreated waste water which in daily exposed Into it. This study is considered as a part of the security program for this humid area which is internationally classified in the Ramsar Treaty.

Our field investigations revealed that there are two stations for treating the waste water are abundent, other three are in working condition in addition to another big station which in working condition at Kerma, Oran.

It has been found that the waste water net-work of small popular urbanisms which are surrounding-the area under study- are either not existing or in the state of construction therefore the waste water is presently disposed within this area.

The investigation on samples of waste water before and after entering the water treatment stations by means of physic and chemical analyses have shown the pollution had occurred. The investigation is also aimed to determine the degree of pollution and the efficiency of treatment in these stations.



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Biography

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Optimization of advanced oxidation process for the treatment of olive mill wastewater

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Abstract

The physico-chemical characterization of olive mill wastewater (OMWW) provide by a three-phase extraction process located in the area of Marrakech, Morocco, showed high organic matter, measured in terms of chemical oxygen demand about 109 g/L. It is also characterized by high content of suspended solids (TSS) about 4g/L. The purpose of this study is to treat OMWW by advanced homogeneous and heterogeneous Fenton-type oxidation process using solutions of iron (III) and iron (II), clay from the Safi region, hydroxide sludge from the water purification station, and a composite material synthesized from olive pulp and $FeCl_3$.In our study, we used the methodology of the experimental research to optimize the parameters that influence the degradation rate of OMWW by Fenton reaction.

The results of the present study showed a promising performances in term of COD and phenol removal of about 37 and 42%, respectively.

Keywords: physicochemical characterization, advanced oxidation, OMWW, clay, Fenton, composite, the methodology of the experimental research.

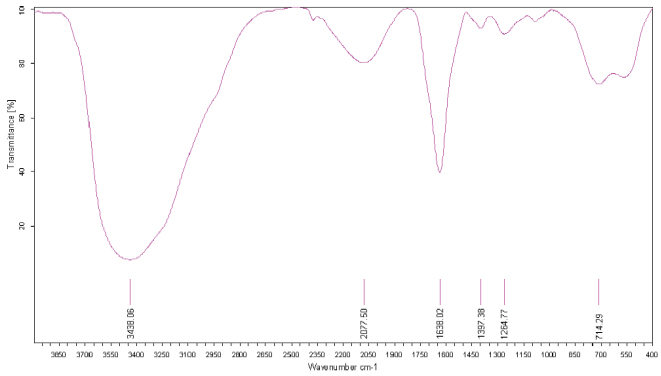

Fig1: Infrared spectrum of OMWW

Biography

Zaina IZGHRI was born in Sidi Ifni city (Morocco), in 1990. She is a PhD student in applied organic chemistry laboratory, Faculty of Science Semlalia, University Cadi Ayyad Marrakesh, under the supervision of professors Abdelrani YAACOUBI, Layla ELGAINIand Abdelaziz BACAOUI.

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Quantification of the sorption of chlorophenolic compounds on the geosynthetic clay liners & an HDPE geomembrane

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Abstract

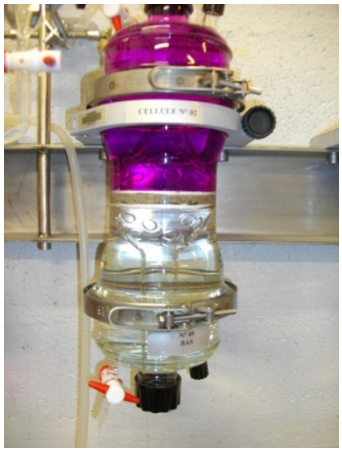
Diffusion tests were performed in the laboratory to quantify the diffusion coefficients, the experimental results obtained on various constitutive geotextiles and bentonites from four geosynthetic clay liners (GCLs) representative of the GCLs commonly used in bottom liner systems in France of phenol, 2-chlorophenol, 4-chlorophenol, 2,4-dimethylphenol, 3,4-dimethylphenol, 2,4-dichlorophenol, 2,4,6-trichlorophenol, 2,3,4,6-tetrachlorophenol, 2,3,5,6-tetrachlorophenol and pentachlorophenol

The objective of this study is mainly to:

- Determine the diffusion parameters on these pollutants, that has not been carried out so far;
- Propose a modeling of the impact of the polarity of these compounds on the diffusion.

The main points I will discuss during this presentation are:

- Presentation of the materials and chlorophenolic compounds studied;
- Quantification of adsorption on geotextiles (GTX) and bentonites (BNT);[1]
- Quantification of the diffusion of chlorophenols in the geomembrane (GMB);[2]
- Quantify and evaluate the impact of the aging of the GSB on material transfers.



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Biography

M. Ahari is an Assistant Professore of organic chemistry at University Ibn Zohr, Agadir. He rceived her PhD in 2008 at Reims Institute of Molecular Chemistry and he was post-doctoral at the National Research Institute of Science and Technology for Environment and Agriculture (IRSTEA).

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Catalytic wet peroxide oxidation for the degradation of an azo dye "Mordant black 11" in aqueous solution

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[1] QHSE Research Group, Laboratory of Catalysis, Materials and Environment, Technology High School, Sidi Mohammed Ben Abdellah University, 2427, Fez, Morocco.
[2] Laboratory of biochemistry, Faculty of Medicine & Pharmacy. Sidi Mohammed Ben Abdellah University, 1893, Fez, Morocco.

Abstract

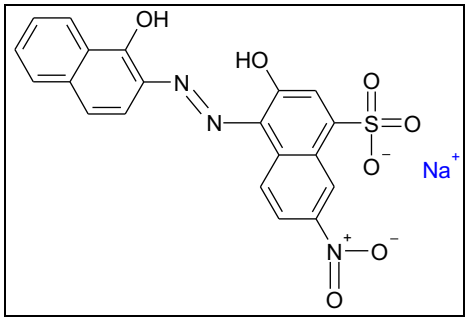
Due to their chemical stability, textile dyes released into the environment provoke degradation in the quality of water, which can lead to the contamination of living beings. Therefore, the aim of this work is to develop a treatment for the degradation of the organic matter in wastewater, particularly, using heterogeneous catalysis. Thus, an azo dye Mordant Black 11 (MB_{11}) was treated in an aqueous solution by the Catalytic Wet Peroxide Oxidation (CWPO) process.

Fly ash (FA), the by-product generated in the thermal power station of "Jorf lasfar" was used as supporting material for the synthesis of our heterogeneous catalysts, via the incipient wet impregnation method. Crystalline structure and surface morphology of the raw FA and the synthesized catalysts were identified using, X-ray diffraction (XRD) and scanning electronic microscopy (SEM), respectively.

Accordingly, catalytic activity and performance of the solid catalyst/H_2O_2 systems were tested as regards of model reactions. The effect of various experimental parameters, such as catalyst dose, precursor loading, initial dye concentration, oxidant concentration, pH and temperature were evaluated.

Remarkably, in the optimal conditions revealed in this study, the Cu-FA/H_2O_2 process improved the degradation rate of MB_{11}.

Figure: Chemical structure of MB11.



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Biography

Youssef Benjelloun has his knowledge in catalytic oxidation and enthusiasm in developing new processes and materials used in wastewater treatment.

His focus is based on the valorization of effective low-cost materials (Fly ash, clay…) to have application in environment field. He is working to get his PhD degree since 2015 from the University of Sidi Mohamed Ben Abdellah, Fez, Morocco. He published 6 papers. His H-index is 3 on Scopus.

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Environmental impact on the biodiversity of coastal resources in the Moroccan Mediterranean region (between Fnideq and Saidia)

Lamiaa Mouzgui[1,2], Hakima Zidane[1], Nor-Eddine Rezzoum[1], Ali Srairi[3], Abdelmjid Dridi[3], Najib Charouki[4] and Ahmed Errhif[2]

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[4] *DP/URD « ODH », Institut National de Recherche Halieutique (INRH-Casablanca), Casablanca. Maroc.*

Abstract

In the framework of the development of scientific knowledge on the structure and functioning of the ecosystem, an in-sea monitoring campaign of the marine ecosystem of the Mediterranean coast located between Fnid'q and Saidia is carried out by the scientific team of the Department of Fisheries of the National Institute for Fisheries Research aboard the research vessel "Al Amir MoulayAbdallah" in summer of 2017. This campaign allowed to identify the ecosystemic reference state of the benthic littoral resources of the Moroccan Mediterranean zone. Of the 37 bottom stations (below 250m depth) sampled by trawling, more than half of the stations have very significant biodiversity dominated by species of commercial interest such as: Pectenmaximus, Callista chione, Glycymeris spp. echinoderms such as Parastichopusregalis.

The analysis of the abundance of these different taxonomic groups of fauna shows a dominance of the cnidarians (32,54%), followed by echinoderms (27,11%), then the crustaceans (16,61%), then the molluscs (16.60%) distributed for bivalves and gastropods respectively in 3.72% and 12.88%. Lastly, sponges with an abundance of 6.77% followed by bryozoans not exceeding 1%. In terms of macroalgae, we identified 12 species belonging to the 3 classes namely chlorophyceae, Phaeophyceae and Rhodophyceae.

At the same time, the main descriptive synthetic biodiversity parameters (specific wealth, abundance, Shannon index and equitability) were calculated for each station. It shows that the area surveyed contains a good wealth of faunistic and floristic diversity with a Shannon index indicating a good ecological status of the environment.

Keywords: Morocco, epibenthic, biodiversity, coastal resources, Mediterranean.

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Polymer inclusion membrane for the facilitated extraction of sugars: Parameters and mechanism

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Abstract

Membrane separation processes have been used form many applications in the chemical industry, as a clean and environmentally friendly alternative to purification, separation or recovery of organic and inorganic substances, given the compactness, simple and efficient operation and low energy consumption. For instance, membrane separation of carbohydrates is proposed substituting traditional methods wich are often a relatively difficult and costly task. Indeed, the recovery of carbohydrates (sugars) from aqueous solutions presents a problem due to their high hydrophilicity, their structure is very similar, flexible and multivalent.

The main purpose of this work was to develop a new Polymer Inclusion Membrane (**PIM**) for recovering Glucose, Fructose and Sucrose. The membrane has been prepared using polyvinyl alcohol (**PVA**) as a polymeric support and Glucaric Acid (Saccharic acid) (SA) as extractive agent. Therefore, the membrane was adopted to study the oriented process for the selective and facilitated extraction of each of these sugars, as well as the influence of temperature factor on the performance of the used membrane. The system can quantify and different parameters, macroscopic permeability (P) and initial flux (J_0) were determined, and microscopic parameters, apparent diffusion coefficient (D^*) and association constant (K_{ass}) relating to the movement of the substrate through the membrane. Similarly, the values of activation parameters (E_a, $\Delta H^{\neq}$, and $\Delta S^{\neq}$) on the transition state of the step association/dissociation of the substrate with extractive agent were determined.

The results show that these processes led through such membranes are based on the association mechanism (Substrate - extractive agent) and are governed by a structural aspect rather than an energy aspect.

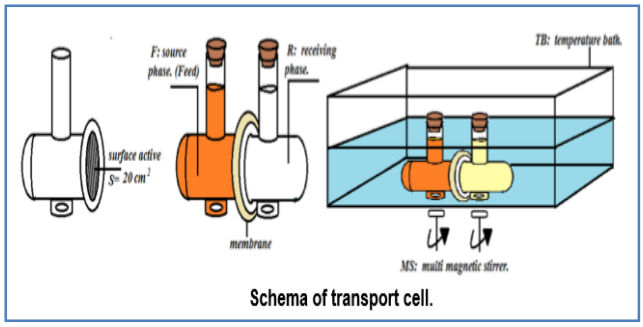
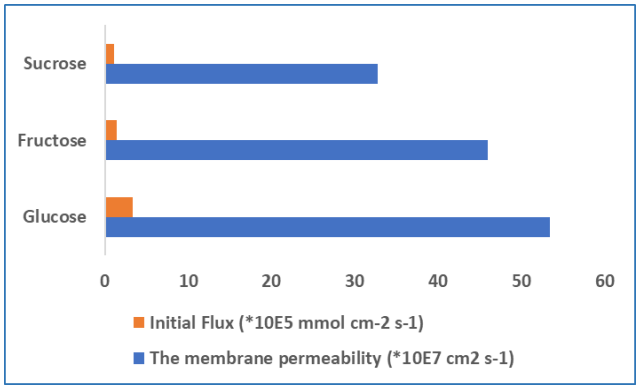


Figure: Parameters relating to the performance of the membrane



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Biography

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New polymer inclusion membrane containing NTA as carrier for the recovery of chromium and nickel from textiles wastewater

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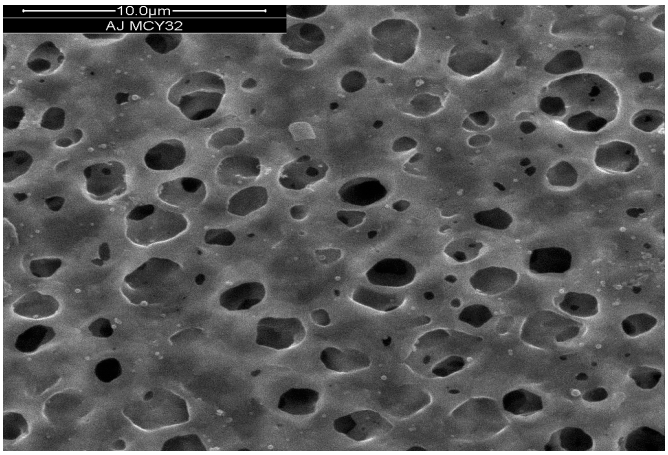
Abstract

Extraction and/or recovery of chromium (Cr) and nickel (Ni) from textiles industry wastewater by membrane separation using polymer inclusion membranes (PIMs) based on polymer supports polyvinylidene fluoride (PVDF) and polyvinyl pyrrolidone (PVP), with Nitrilotriacetic acid (NTA) as extractive agent (EA). Furthermore, to quantify the PIMs performances, the macroscopic parameters such as the membrane permeability, P, and the initial flux, J_0, and the microscopic parameters such as the association constant, K_{ass}, and the apparent diffusion coefficient, D^*, were determined based on the Fick's first law and the saturation law of the EA by the substrate (S). Also, to explain the substrate (S) (Cr or Ni) recovery process performed by the membrane, and to elucidate the mechanistic aspects, the activation parameters such as the energy E_a, the enthalpy $\Delta H^{\neq}$ and the entropy $\Delta S^{\neq}$, were determined. The efficiency of different PIMs to recover Cr and Ni was compared. Respectively, the influence of temperature and pH on removal performance was investigated. The results showed that the macroscopic and microscopic parameters increased with increasing temperature and acidity medium. Similarly, the values of the activation parameters make it possible to explain the membrane performance and to elucidate the mechanism relating to the diffusion of the extracted substrates through this membrane.



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Biography

Youssef CHAOUQI is a PhD student in Hassan II University, the author has his expertise in synthesis and characterization of affinity polymer membranes with different extractive agents for the oriented process relating to the extraction, separation and recovery of values added compounds from industrial waste.

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Mapping and Spatial Distribution of Trace Elements in Agricultural Soils of the Sfafaa Region (Gharb,Morocco)

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Abstract

Our study has for the purpose of mapping the vulnerability of the soils of the Sfafaa region to contamination of trace elements through the monitoring of trace elements (TE).The approach followed is that of the spatial analysis under Geographic Information System (GIS). Indeed, after a campaign for soil sampling and analyzes in the laboratory. The results have been spatialized through the Geographic Information System GIS in order to establish the relationship between the levels of contamination observed for each species and their spatial distribution.The total concentrations of heavy metals were assessed for samples from seventeen sites representative of the agricultural lands, selected along the Beht River, over a period, from March to June of 2013 and 2014. Concentrations of seven elements were determined: Mn, Cd, Cr, Cu, Ni, Pb and Zn.The results show that the Ni, Cr,and Cd present high concentrations in plots irrigated by groundwater. Cr concentration is the most important (319.70 ppm), exceeding the standard for a normal soil (100 ppm) while the average content of Zn is 89.81 ppm, below the standards for a normal soil (200 ppm). In general, the results showed a metal contamination that exceeds the standards for Ni, Cd and Cr, due to the overuse of fertilizers. These results confirm the impact of the agriculture intensification on the quality of the soils in the Gharb region.

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Hydrochemical Study of Groundwater Quality in the M'nasra zone (Kenitra,Morocco)

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Abstract

The main aim of this study is to assess the groundwater quality in the Mnasra zone (Kenitra,Morocco), a zone with high agricultural activity, and to identify its physicochemical characteristics. We have carried out a qualitative study of the water in different sites of the irrigated perimeter of M'nasra located in the province of Kenitra (Morocco). In fact,several measurement campaigns (pH, groundwater depth) and laboratory analysis (ionic balance) were conducted to determine the physico-chemical characteristics of water such as the electrical conductivity (EC), bicarbonate (HCO_3^-), nitrate (NO_3^-), sulfate (SO_4^{2-}), magnesium (Mg^{2+}), calcium (Ca^{2+}), chloride (Cl^-),and sodium (Na^+). We prospected 18 wells, during summer and winter seasons, distributed into 3 different zones: A, B, and C. The results showed that the depth of water table varied between 3 and 50m and 77.8% of the wells are polluted by nitrates.The temporal and spatial monitoring of the chemistry of these waters had shown that the hydro-chemical quality depends on the lithological nature of the underlying formation and, secondly, on anthropogenic pollution (in our case: use of nutrient rich fertilizers and proximity to Ouled Berjal waste discharge).

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Feeding habits and trophic relationships among bottom fish species of Moroccan Atlantic

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Abstract

The Moroccan Atlantic coast, between Tanger (35°47'N) and Sidi Ifni (29°22'N) includes a wide range of fish species, many of which are of commercial interest. These communities have supported intense fishing activities. The trophic ecology of bottom communities has been poorly investigated in this area. The lack of knowledge on feeding habits and trophic relationships among major fish species in this area has always been a central issue in the development of ecosystem-based models. In marine ecosystems, information on diet and trophic relationships is the basis for the interpretation of species interaction in multispecies trophic models. In this context, the main objective of this work is to study resource used by major bottom fish species. Diets of nine demersal fishes were analyzed to describe their feeding habits. The selected species for this study are some of the most abundant bottom fish. The species were sampled during the trawl survey carried out in the north Atlantic of Morocco. Stomach contents were examined. Some indices (frequency of occurrence, percentage by number, percentage by weight and index of relative importance) were used in order to express the importance of different prey in the feeding habits of these species. The analysis of stomach contents showed that all of them are carnivores and feed on benthic invertebrates and fish. Multivariate analysis and subsequent clustering led to a grouping of the species within three trophic guilds. the different epibenthic crustaceans were the most important groups in defining trophic guilds.

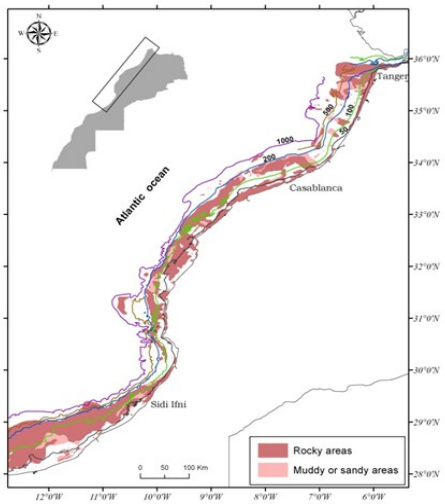

Figure 1: Geographical location of the study area in the north Atlantic of Morocco.

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Biography

Dr. Souad Abdellaoui, Ph.D. from the Mohamed 1er University in Oujda, Morocco.
I am Fisheries Biologist and marine ecologist with fifteen years of research experience in Morocco. My work includes the bio-ecological aspects of marine benthic community in very large areas of Moroccan Atlantic and Mediterranean Sea, which led to a string of papers published in refereed journals. This area of study continues to be a primary interest. My recent research includes Resource partitioning within major bottom fish species and trophic relationships in Moroccan Atlantic Sea.

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Contribution to the hydrochemical study of aquifers of the High Guir Basin (Oriental High Atlas - Morocco)

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Abstract

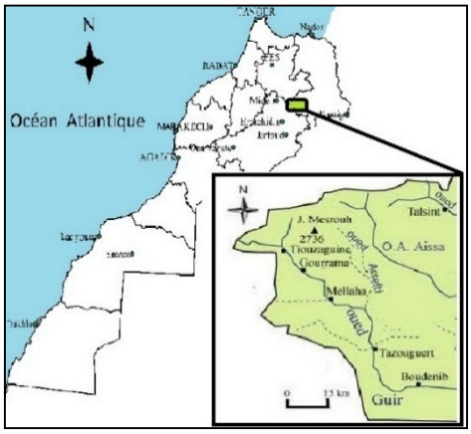
The high Guir Basin, which is part of the oriental High Atlas, has been the subject of hydrogeological and hydrochemical studies. Information on aquifers in the area is still fragmentary and insufficient because of the large extent of the high Guir Basin and its complex geological structure. Access to drinking water, particularly in the Guir Basin, is a key factor in economic development, improving people's living standards and stabilizing them in rural areas.

The objective of this work is to evaluate the physicochemical quality of groundwater in the high Guir Basin and to determine the sources of pollution in order to establish a quality map of the water table of the high Guir Basin. Ten water points were sampled. Seven chemical elements were analyzed at the COSTE-Oujda Laboratory: Electrical Conductivity, Water Temperature, pH, Turbidity, BOD5, COD, SO^{4-}, NH^{4+}, NO^{3-}, NO^{2-} and Cl^{-}.

The degradation of the water quality of the Jurassic aquifers of the Upper Guir Basin could have geological and anthropogenic origins

Keywords: high Guir Basin, Groundwater, Quality, Pollution, GIS, Morocco.

Figure: Geographic localization of the High Guir Basin.



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Biography

Author with his expertise in groundwater quality assessment and modeling and mapping of groundwater and image processing Radar and Landsat ETM +, plus the realization of environmental studies with design office ANZAR Council-Rabat.

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Adsorption of methylene blue on industrial softwood waste "Cedar" and hardwood waste "Mahogany": comparative study

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Abstract

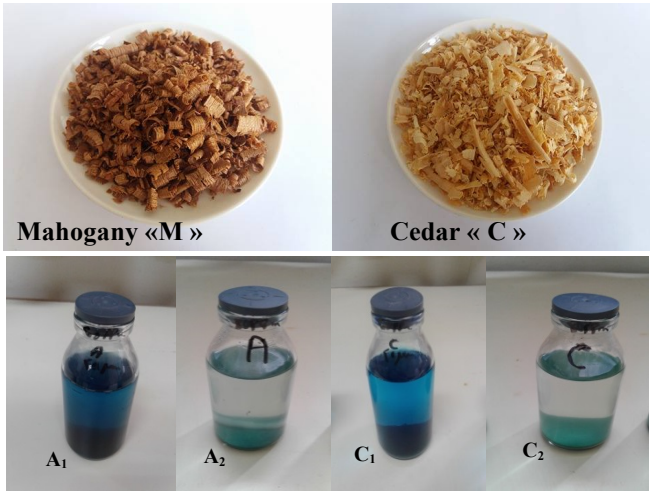
The textile industries account for 31% of all Moroccan industries using toxic synthetic dyes and leaving liquid waste without any prior treatment, creating enormous environmental risks. The reduction of pollution at the source and the treatment of these effluents become a necessity.

In this study, a new approach to treating textile effluents is to exploit industrial wood waste as a clean, biodegradable and inexpensive biosorbent in the adsorption of methylene blue.

Two types of softwood waste (Cedar) and hardwood waste (Mahogany) are collected from a local industry in Fez city/Morocco, previously characterized by various physicochemical analysis techniques (X-ray fluorescence, ray diffraction X, Fourier Transform Infrared and Scanning Electron Microscopy) are used in this study.

The adsorption potential of an aqueous solution of methylene blue (MB) on these sawdusts (Cedar and Mahogany) was evaluated by studying the influence of different experimental parameters.

Adsorption rates of 98% on cedar sawdust and 96% on that of mahogany were reached at room temperature and at pH = 4. The kinetic study showed that the adsorption process follows a pseudo-second order model; the equilibrium isothermal model is a Langmuir type. The adsorption capacity of Langmuirmodel is 36.23 mg per onegram for Cedar with a regression R^2 = 0.9885 and 40.65 mg per one gram for Mahogany with R^2 = 0.9713.According to this study, it can be concluded that these sawdust are very effective for the removal of methylene blue and can be tested for removing other cationic dyes.



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Biography

EL HAJAM Maryam student in my second year of thesis, I work on the valorization of industrial wood waste: contribution to the protection of the environment. My goal is based on the use of sawdust in environmental applications, such us the removal of dye using the sawdust of cedar and mahogany.

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Consequences of surface water eutrophication: remedy and environmental interest

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Abstract

The nutrient salts enrichment of estuarine waters causes the phenomenon of eutrophication, one of the main results of which is the massive proliferation of algae. In order to reduce the negative impacts of the development of this biomass, and in the face of the difficulties of fighting against, researchers have turned their attention to the path of their valorization.

This work presents an attempt to valorize green algae by co-composting, mixing them with poultry manure and margins.

The mature compost is obtained after 100 days. It is odorless, brownish in color, rich in nutrients and has the characteristics of a standardized bio-fertilizer with no phytotoxicity and polyphenols.

The application of the produced compost on the germination and the soil improvement showed an improvement of the productivity of the farms.

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Biography

LoubnaBougarne, PhD student in Biology, Science and Environmental Engineering at Sidi Mohammed Ben Abdellah University, Fez, Morocco. Its work is based on the evaluation and monitoring of the quality of surface and underground water, the detection of associated health risks and the search for ways of remedying diagnosed problems. So far she has published more than 06 articles, of which 01 is indexed on Scopus.

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Study of the characteristics of the constituents of a composite based on aggregates made from marine wastes

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Abstract

Mussel shells are among the most predominant shells found along the coastline of the Moroccan Atlantic Ocean. These shells are usually collected in a traditional way by the local population. This activity generates significant quantities of waste that are thrown into the natural environment without any treatment. As a result, a multiform pollution is generated by this activity.

The principle of this study is the recovery of this shell waste through its use as a building material for the formulation of cement-based composites. This valuation will certainly have a positive socio-economic impact on the local population.

The main objective of this article is to study the technical characteristics of the components of a composite formulated on the basis of mussel shell aggregates as a total or partial substitution of sand and gravel. This study consists in carrying out several tests on different components of the composite in order to verify their conformity with the requirements of the standards.

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Biography

The author is a PhD student at the National School of Applied Sciences (ENSA Agadir), university IBN ZOHR. He works on the theme of recovery of shellfish waste for the formulation of cement-based composites.

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Application of bentonite clay for defluoridation of water resources

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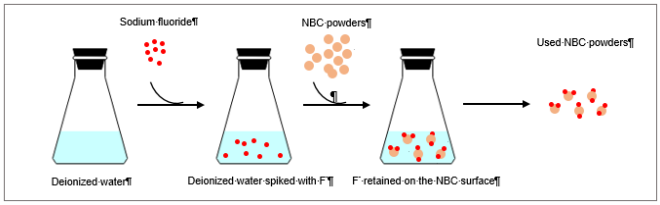
Abstract

Fluoride is one of the most plentiful elements on earth, and occurs naturally in water[1]. Excess of fluoride in water is harmful to human health[2,3]. Removal of excess fluoride (F^-) from the water has been attempted by several authors by using different materials [4,5]. The main aim of this study was to attempt the fluoride removal by using the locally available bentonite clay adopting batch reactor method (Figure 1). The compositional, structural and textural characteristics of the natural bentonite clay were determined using accurate physicochemical and mineralogical characterizations. The analysis of fluoride ions in the liquid phase was performed using the potentiometric method with a fluoride-specific ion electrode. For fluoride removal, the effect of contact time, adsorbent dosage, adsorbate concentration, and pH were evaluated in batch procedures. The maximum adsorption capacity of the bentonite clay was observed to be 52.2% at room temperature. Maximum adsorption of fluoride was optimum at 30 min, 2 g L^{-1} of adsorbent dose, 5 mg L^{-1} of initial fluoride concentration and pH 2. Kinetic studies revealed that fluoride adsorption fitted well to pseudo-second-order model than pseudo first order. The adsorption kinetics and isotherms were well fitted by pseudo-second-order and Langmuir models, respectively indicating chemical and monolayer adsorption. This study proves that the natural bentonite clay is a promising adsorbent with a high adsorption capacity for fluoride and can be a substitute for conventional defluoridation methods.

Figure 1: Graphical illustration of wastewater defluoridation by adsorption on natural bentonite clay



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Electrocoagulation treatment of food industrial dye waste using external loop airlift reactor

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Abstract

Wastewater containing dyes is usually released directly into nearby sewers, rivers, ponds or lagoons. This wastewater disposal can damage the quality of the receiving water, the aquatic ecosystem and the biodiversity of the environment. The presence of these dyes in water, even at low concentrations, is highly visible and undesirable. In addition, dyes can affect aquatic life due to the presence of aromatic rings, heavy metals, etc [1].

Various methods were used to eliminate this color such as coagulation, flocculation, photo catalysis, etc. However, these methods are very expensive. The removal of dyes from wastewater using an electrocoagulation process is an alternative treatment since it does not generate environmentally toxic products [2,3]. This may eliminate or reduce the pollutants from waste [4 ,5].

The present study concerns a batch mode electrocoagulation process using an external loop semi-pilot reactor of 20L capacity (figure 1). Further, the high concentration of dye wastewater is used for evaluating the reactor.

Optimization of experimental parameters was carried out to have a good color removal efficiency. So the effect of electrolysis current, electrolysis time, dye concentration and the position of electrodes in the riser on the quality treatment was studied. The quality of the treatment was evaluated by UV-visible spectroscopic, concentration of Fe and COD removal.

The results obtained are presented and commented.

Keywords: Electrocoagulation, Ponceau 4R, External-loop airlift reactor.

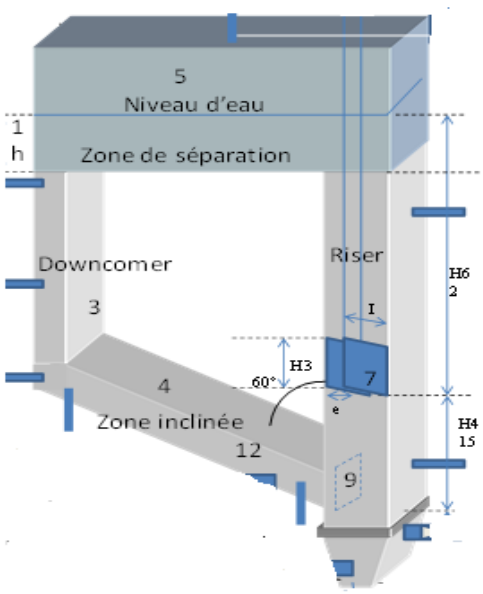

Fig.1 : *External-loop airlift reactor.*

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Biography

PhD student in environmental chemistry from the University of Ibn Zohr, Agadir. My thesis's topic «Experimental and theoretical study of the electrocoagulation process : Application to the treatment of industrial and communal effluents ». I have published 2 papers in international Journal

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Pesticide removal in drinking water treatment using biodegradable polymer

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Abstract

The presented work belongs to the study of development of simple technology for the treatment and elimination of pesticides of triazine families and organochlorines likely to be contained in drinking water.

Endosulfan and its metabolites endosulfan sulfate (Ed-Sft), endosulfan ether (Ed-Et) and endosulfan lactone (Ed-Lc) as well as three molecules of the triazine family: atrazine (Atz), terbuthylazine (Tbz) and desethylatrazine (D-atz) were tested at different concentrations.

The adsorbent tested is poly (ε-caprolactone) (PCL). It is a biocompatible and biodegradable thermoplastic polymer.

The experiments were performed in a closed batch system. The identification and assay of non-absorbed analytes was by gas chromatography GC/MS. The absorbability process was repeated three times for each concentration.

The kinetic curves of this study showed that PCL grains can easily remove endosulfan and its metabolites, which is not the case for the three molecules of the triazine family. Indeed after a contact time of about half an hour 99.97% of Ed-Lc, 90% of Ed-Sft and 88% of Ed-Et were absorbed. Two hours later, all of these analytes were removed from the doped solution. The kinetic curves show that the PCL used has a high affinity with endosulfan lactone compared to other analytes.

The maximum absorption of Atz (30%) and Tbz (43%) was marked after twenty-four hours of contact.

The PCL powder was also tested. The same experiments were used analogous to the PCL grains. The results show in this case that the absorption of the micropollutants on the PCL powder is faster than on the PCL grains, but in the long term their absorption capacities are similar. In fact on the PCL powder these micropollutants were totally absorbed after only 10 minutes. This demonstrates the fact that milling the powdered grain can increase the access to the absorption sites without changing the number. It can be deduced that the particle size seems to have an influence on the absorption kinetics but not on the absorption capacity of the PCL. To evaluate the absorption capacity of granulated or powdered PCL and apparent desorption of micropollutants from the absorbent, we loaded the PCL with a large amount of endosulfan and metabolites. The solutions are filtered. Analytes are extracted by the mean of C-18 and analyzed using GC/MS. From the obtained results it is found that granulated or powdered PCL has a high absorption capacity. This absorption is reversible. However, the desorption rate is very low. It varies between 0.01% for (Ed-Lc) and 1.35% for Ed-And.

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Numerical modeling of flows in discovered channels by an implicit finite volume scheme

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University Mohammed Premier, ENSA-Oujda, Oujda 60 000, Maroc

Abstract

Canals and sewers are part of the structure of our cities. Canals are bio-diversified spaces; they bring an important part of the nature in the cities of today, called sustainable cities. With today's outgrowth of pollution and the problem of global warming, introducing a canal in the middle of the city is refreshment for this one and its inhabitants, who find in these green spaces an escape to the daily pollution. On the other hand, sewers are essential to the evacuation of waste and pollutants produced either by the ordinary citizen or the big factories and industries. Flow modeling in these channels allows us to prevent and anticipate most problems and disasters that may occur.

This work focuses on the modeling of flows in open channels with variable beds and geometries. The section is rectangular or trapezoidal, constant or variable in the direction of the length and the regime is subcritical, transitory or supercritical. The flow is governed by the equations of Saint-Venant and the resolution is carried out by the implicit scheme whose use allows a wide time step offering a saving in CPU time, however, handling and inverting large matrices is very expensive in CPU time. The source term is processed by the upwind scheme of Roe-Vazquez in order to verify the C-property. The application to tests whose analytical solution is known shows a very good agreement between the numerical and theoretical solutions.

Biography

O.BOULERHCHA PhD student in Physics and Engineering at the Mohammed Premier University of Oujda - ENSAO, thesis under the theme: "Development of an unstructured implicit solver for the resolution of free surface flows coupled with the transport-diffusion of pollutants."

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In vitro chemical and antimicrobial screening of fruits and leaves extracts of *Zyziphus* lotus collected in North West of Algeria

Chelli Chentouf N., TirtouilMeddah A., Belgharbi A., BenfrehaTemmouri H., Meddah B

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Abstract

The present study was conducted on *Zizyphus lotus* L., medicinal plant (from the family of Rhamnaceae) which is well-known as Sedra in Algeria. This plant is very used in the traditional medicine to cure gastro-intestinal tract, respiratory infections and other ones. It is also known for its anti-inflammatory, analgesic, anti-ulcer and anti-diabeticproperties. Natural extractsderivedfrom plants contain a variety of active biologicalmolecules. In thiscontext, we have attempted to evaluate*in vitro* the chemical screening of fruits and leaves extracts (aqueous and etheric) of *Zizyphus lotus* collected in Mascara city (Northwest of Algeria), followed by an antibacterial test of these two extracts against buccal strains responsible of caries and parodontitis on students. Phytochemical screening revealed the presence of free quinons, combined anthraquinons, flavonoïds and tanins without alcaloïdes. These results confirmed by a quantitative analysis (phenolics and tanins quantification) for aqueous extract, the content of phenolic compounds and tanins were about 651.80 and 591.45µg EAG/mg respectively. For the etheric, it was 563.17 and 542.93 µg EAG/mg for polyphenols and tanins successively. *In vitro* evaluation of the antimicrobial activity of the extracts showed a significative power on microbial strains teste despecially the aqueous extract.

Keywords: *Zizyphus lotus,* aqueousexract, etheric exract flavonoids, tanins, antimicrobialactivity.

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Biography

Author has her expertise in evaluation and passion in biological activities of spontaneous and medicinal plants. Her focus is based on the ethnobotanical studies and evaluation of benefit of these plants against different pathologies. She was warded her PhD in 2013 from the University of Mustapha Stambouli of Mascara, Algeria,Africa Country. She published 4 papers.

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Synthesis and use of modified wool fibersfor sulfate ionsadsorptionfrom aqueous solutions

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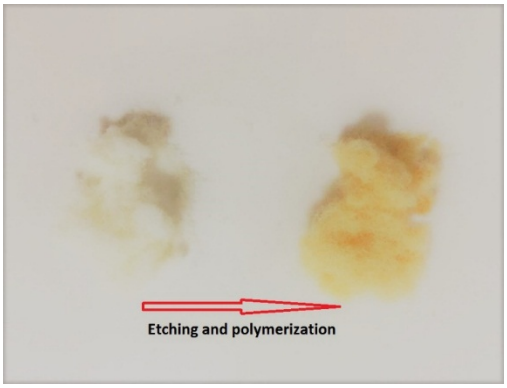
Abstract

This work focuses on the removal of sulfate ionsfrom water by the adsorption method on textile fibersdoing the grafting of acrylic acid (AA), acrylamide (AM) and allylamine (Al) on wool fibers. The modification has been realized in aqueous solution in two steps; firstly,the wool fibers were etched with iron chloride ($FeCl_3$) to create more positive charges on the fibers surface. Secondly,the grafting was made by using potassium persulfate ($K_2S_2O_8$) and sodium bisulfite ($NaHSO_3$) as initiator. Then, a comparative study was carried out to determine the rate of elimination of sulfate ions in water according to the three monomers. The characterization of wool modification was investigated by FT-IR,MEB and optical microscope. The results of adsorption were analyzed by UV-Visible spectroscopy.



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Biography

Fatine Akoh holds a Master in engineering and environmental management in industrial environment and she is currently pursuing her doctoral studies in water treatment at the Faculty of Sciences Ain Chock, Casablanca-Morocco, her research is based on finding out water treatment processes, which are affordable in terms of cost and production through adsorption channels on textile substrates at ESITH research and development laboratory “Higher School of Textile and Clothing Industries”.

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The effect of aggressive environments on the properties of a low calcium fly ash based geopolymer and the ordinary Portland cement

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Abstract

This paper analyzes the effects of four different aggressive environments, sulfuric acid solution (5%) and magnesium sulfate solution (5 g/l), sodium sulfate (44g/l) and sodium chloride (164g/l), on the structure (durability) of fly ash based geopolymers(FA-GP) and ordinary Portland cement (OPC).

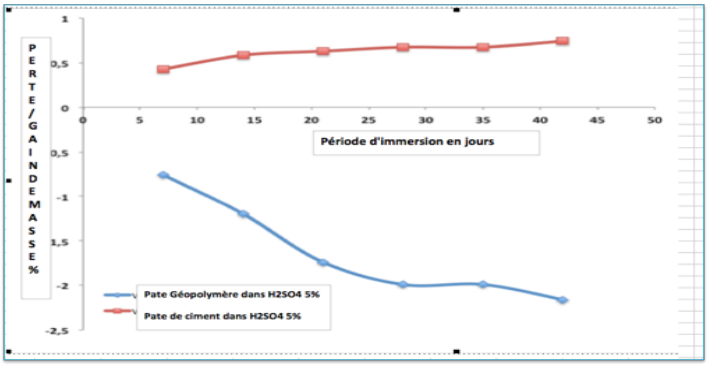
Geopolymer pastes were prepared by activating the fly ash with a mixture of sodium hydroxide (12M) and sodium silicate solution; the samples were cured at 70˚C for 24 hrs. The Ordinary Portland Cement pastes were prepared by mixing a cement CEM II 32,5 R and water in a water / cement ratio of 0.5.

The samples were subjected to the aggressive solutions over a period of 120 days. and the effects of the aggressive solutions wereevaluated by visual, weight loss, and microstructural changes.

It was found that the FA-GP geopolymer was poorly altered while the OPC cements are severely damaged after 120 days immersion in the 5% sulfuric acid solution. The decomposition of Portland cements in the medium is due to the formation of ettringite and gypsum which are very expansive materials which cause the cracking and bursting of the cement paste. The formation of ettringite and gypsum is confirmed by FT-IR and DRX analysis.

The immersion in the magnesium sulfate solution, sodium sulfate and sodium chloride, caused a small change in the structure of the FA-GP and OPC, and we can conclude that the performance of FAGP materials is higher than that of Portland cement in corrosive media.

Key Words: Fly ash geopolymer -Ordinary Portland cement- Structural change- acid resistance- weight loss- sulfate resistance.



Mass loss/gain of FA-GP paste and Ordinary Portland Cement after immersion in sulfuric acid solution 5%.

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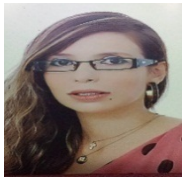
Biography



Author is a PHD student, enrolled in the second year, working on the subject entitled “ The development of geopolymer materials based on fly ash and Moroccan clays”.

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Membrane processes for elimination and recovery of Cr(VI) and Cr(III) ions according to the facilitated extraction oriented process through a grafted polymer membrane

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[3]Laboratoire de Recherche sur les Matériaux Textiles (REMTEX), ESITH Casablanca, Maroc.
Project PPR2 (MESRSFC-CNRST)

Abstract

The protection of the environment is a government priority for all countries

Several processes have been used for the removal, recovery and separation of harmful elements, such as liquid-liquid extraction, column chromatography, ion exchange processes and membrane processes. Today, membrane processes are among the most efficient extraction technologies in different fields to see the benefits (low energy consumption and use of simple efficiency techniques).

In the present work, we have developed a grafted polymer membrane (**GPM**), with polysulfone (PSU) as polymer support and Gluconic acid (**GA**) as extractive agent. The obtained membrane was characterized by the IR spectroscopic technique which shows the integration of the GA agent into the polymer matrix. While the SEM technique allowed to characterize the morphology as well as the porosity of the elaborated membrane. This membrane has been adopted to carry out experiments on the oriented process of extraction and removal of Cr(VI) and Cr(III) ions. The system was quantified and the macroscopic parameters, Permeability (***P***) and initial Flux (***J_0***) were determined, as well as the specific microscopic parameters, apparent diffusion coefficient (***D****) and association constant (***K_{ass}***) relating to the association of substrate **S** with extractive agent **T** (GA) to form unstable entities (**ST**) during the migration of Cr(VI) and Cr(III) ions through the membrane phase. Studies on the influence of $\mathbf{C_0}$ initial concentration of Cr(VI) and Cr(III) ions, acidity and temperature factors of the medium, on the evolution of these parameters (***J_0***, ***P***, ***K_{ass}*** and ***D****) were carried out.

These results allow determining the activation parameters (***E_a***, ***$\Delta H^{\#}$*** and ***$\Delta S^{\#}$***) and show that pH and temperature factors greatly influence the variation of the parameter values, as well as the performance of this membrane type adopted for the studied process.

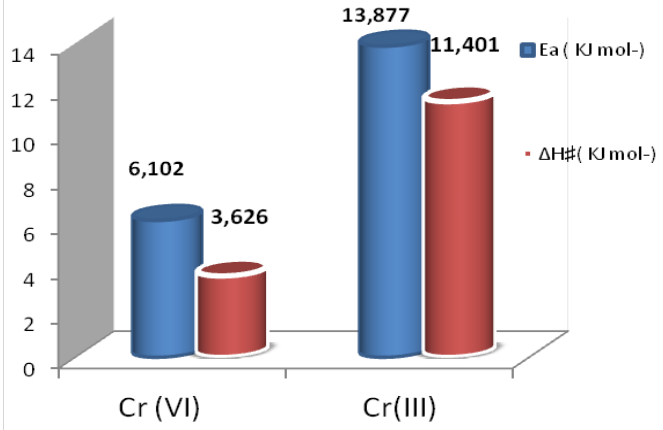

Figure: Activation energy ***E_a*** and Activation Enthalpy ***$\Delta H^{\#}$*** relating to the facilitated extraction of chromium ions.

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Biography

I am a PhD student at the Laboratory: Genie of Materials for Environment and Valorisation (**GeMEV**), I3MP Team.
I carried out studies on oriented phenomena related to the facilitated extraction of toxic metal ions by several types of functionalized polymer membranes.
An article is being prepared with my thesis director **Pr. M. Hlaibi** on the extraction of Cr(VI) and Cr(III) from an acid medium.

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Combination of cooling and dust collection systems in a sulfuric acid plant: a cooling coil and a rotary drum with sprays

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Abstract

The particularity of the roasting pyrrhotite process is the production of both sulfurdioxide and a hematite-rich waste Fe2O3 as a secondary product, known as roasted pyrrotite ash. Because of its high temperature 270°C and its ultrafine particles, the roasting processing generates excessive dust which could harm not only worker's health but also environment. The dust collection system in place, in the case study plant (Morocco) consisting of cyclones and ESP precipitators, do not collect all of this dust. To mitigate the spreading of dust all over the plant, an additional system to settle the dust is needed.

In this work, we propose a combination of cooling and dust collecting systems at the same time, that ensures a decrease of high temperature, an obstacle while spraying, and then settle down airborne hematite. So, a cooling coil is immersed into the bed of fine particles of the conveyor moving towards the storage hall. After being cooled, the challenge is the capture of dust in a rotating drum provided with sprays.

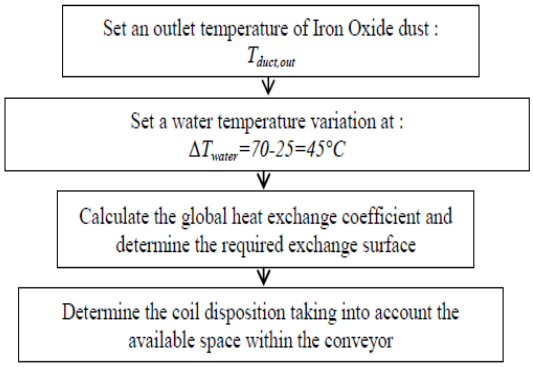

***Figure 1:** Organization chart of coil design*

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Biography

I am Imane AARAB, a chemical engineer from the National School of Mines of Rabat. I am a graduate from the promotion 2016. Actually, I am a PhD student at the laboratory of Applied Chemistry (LCA) in the faculty of sciences Semlalia in Marrakesh (FSSM). My final year project focused on a priority subject of the company MANAGEM. The work so much appreciated by the jury members and the industrial sponsor was the subject of a publication. Now, I am working on an industrial project in collaboration with the R&D OCP, on the optimization of flotation. It covers the fields of adsorption, surface chemistry, mineralogy, process optimization ... I published an article "Combination of cooling and dust collection systems in a sulfuric acid plant: a cooling coil and a rotary drum with sprays" in the journal JMES, 2017 Volume 8, Issue 7, Page 2428-2442; indexed in Scopus.

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Sustainability of a cropping system under the use of unconventional water for irrigation under semi arid conditions in Morocco

L. El Youssfi[1], R. Choukr-Allah[2], M. Zaafrani[3], A. Hirich[4], H. Fahmi[2], A. Rami[2], K. Laajaj[2] & H. El Omari[2]

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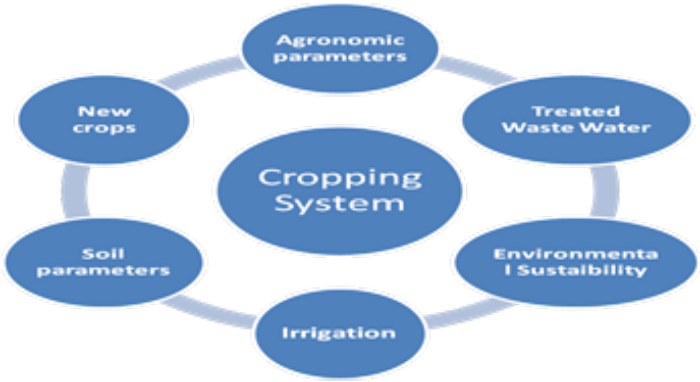
[3] Faculty of Sciences of Agadir, Ibno Zohr University, Morocco
[4] International Center for Biosaline Agriculture, Dubai, UAE

Abstract

The present study was undertaken within the context of searching non conventional water resources for irrigation and alternative crops that can adapt in adverse conditions. This work was conducted in Agadir, in southwest region of Morocco. It aimed to assess the effects of the use of treated wastewater on soil properties and agronomic parameters by adopting crop rotation introducing quinoa (*Chenopodium quinoa* Willd.) as a new crop under semi-arid climate. Different parameters were monitored such as biomass production, yield, and nutrient accumulation in crop's leaves and the level of electrical conductivity and soil nitrate during the three growing seasons. Results show that quinoa proved a promising behavior when it is preceded by the culture fabae bean in term of water use efficiency and also recording to the lowest level of salt accumulation in the soil in comparison with the combinations bean> quinoa and fallow> quinoa. For growth and yield, it was found that after growing quinoa chickpea was more advantageous in terms of biomass productivity and yield. The adoption of any of the different cropping rotations corresponds to the choice of the best cropping system that can insure the sustainability of the local production system under semi arid conditions with the possibility of use of treated wastewater for irrigation.



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Biography

Lahcen EL YOUSSFI, Agronomy Engineer, Agro-Environment Researcher
He focuses in his research on the development of application of bio-ecological, technical and economic principles for sustainable agro-ecosystems management (Soil, Water and Plant continuum); He published a good number of papers on integrated water resources managements and the sustainability of the cropping systems in semi-arid regions with focus on the sustainability of water, plant and soil resources. . He is the responsible of training and research activities within the agro-biology and rural development program and member of the steering committee of Aromatic and Medicinal Plants research Cluster. He is also interested in developing social entrepreneurship with a group of students and Young Leaders. He is member of the Global Young Academy GYA, of Sciences and Young Affiliate of the African Academy of Sciences;

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Integrated Water Resource Management and Ethics: comparative case studies from the Maghreb region

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[2] Mohammadia School of Engineering, Mohamed V University & High National School of Mines of Rabat, Rabat, Morocco
[3] Institut Supérieur des Sciences et Techniques des Eaux, Gabès, Tunisia

Abstract

One of the crucial and dismissed aspects related to IWRM (integrated water resource management) strategies in the Maghreb region characterized by a domination of arid and semi-arid climate, is the ethical issue. Thus, even with the adoption of IWRM strategies and development in water resource policy, regulation, law, management, monitoring, health and research in water resources sector, there are still many challenges. Those challenges are related to poverty, inequality, social and environmental injustices that pervade the Maghreb Territory. In fact, sustainable use and protection of water resources is essential for addressing some of these social challenges. How can equity, and social and environmental justice, in its broad sense of including human and ecological constituencies, are achieved in the allocation of water and in the management of water resources?

This paper aims to draw an overview on the ethics issue and values related to water resources management by proposing a Systemic-Relational (SR) perspective. This perspective will be applied at different levels using case studies within the context of IWRM and the Maghreb and may give other examples from the Mena Region.

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Biography

Lahcen EL YOUSSFI, Agronomy Engineer, Agro-Environment Researcher

He focuses in his research on the development of application of bio-ecological, technical and economic principles for sustainable agro-ecosystems management (Soil, Water and Plant continuum); He published a good number of papers on integrated water resources managements and the sustainability of the cropping systems in semi-arid regions with focus on the sustainability of water, plant and soil resources. . He is the responsible of training and research activities within the agro-biology and rural development program and member of the steering committee of Aromatic and Medicinal Plants research Cluster. He is also interested in developing social entrepreneurship with a group of students and Young Leaders. He is member of the Global Young Academy GYA, of Sciences and Young Affiliate of the African Academy of Sciences;

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Inhibition of scaling of potable water by the Orange Juice Concentrate

S. Ben-Aazza, A. Hadfi, M. Belattar, S. Mohareb and A. Driouiche

Team "Materials and Physico-chemistry of Water", Faculty of Science, University IBN ZOHR, P.O. BOX 8106, Agadir.

Abstract

Scaling of drinking water pipelines has become one of the major problems encountered in the Tiznit region. The waters have high hardness reaches 59 °F[1,2].This one engendered the formation of hard deposits adhering to the internal walls of pipes and structures that carry water. The technical consequences of this phenomenon are numerous (partial obstruction of the pipes, decrease of flow, ...).

There are several methods to prevent this phenomenon. The use of inhibitors remains an unavoidable and widespread application. Several inhibitors synthesized in the laboratory have significantly reduced the phenomenon of water scaling.However, their high toxicities and their environmental impact hasfavored the increasing use of a new generation of inhibitors extracted from plants, which are distinguished on the one hand,by a better inhibiting effectiveness of calcium and on the one hand, by a better inhibiting effectiveness of calcium carbonate; on the other hand, by their ecological effectwhich ensures high efficiency at a cheaper price and with the respect of health and environment norms. These types of inhibitors do not contain heavy metals or toxic compounds and they are also biodegradable.

The objective of this work was to evaluate the inhibiting effect of "Orange Juice Concentrate" on the phenomenon of scaling of potable water to replace the conventional chemical inhibitors harmful to the environment.This inhibitor is a product prepared by the cooperative of Moroccan vegetables and citrus fruits (COPAG)and used for the preparation of the food product nectar "Nectary".In order to do that we followed the kinetics of formation of $CaCO_3$ in absence and in the presence of inhibitor " Orange Juice Concentrate" on a calco-carbonic solution of hardness 40°F by using the controlled method of degasification "LCGE". The total inhibition ofscaling is obtained in the presence of 0.68 ppm of this inhibitor.

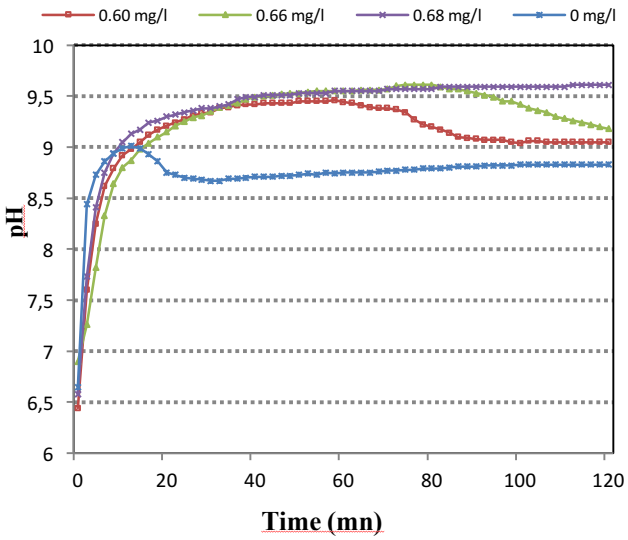

Figure: Variation of pH according to the time of the tests with inhibitor orange concentrate.

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[2] S. Ben-Aazza, A. Hadfi, M. Belattar, R. Aba-Aaki, N. Hafid and A.Driouiche, JMES, 2017 Volume 8, Issue 5, Page 1756-176

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Corrosion inhibition and adsorption properties of mineral compound phosphate-bismuth on ordinarysteel in 1.0 M HCL solutions

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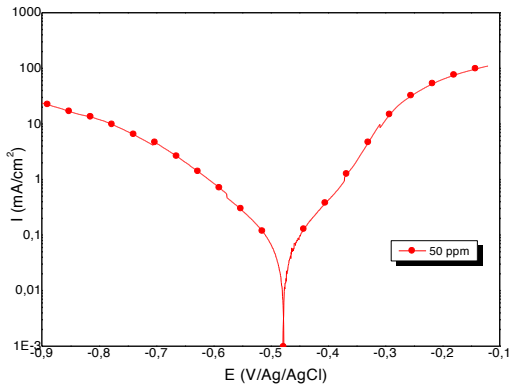
Abstract

Our study focused on the inhibitory effect of mineral compound phosphate-bismuth on the corrosion of ordinary steel in1.0 M HCL solutions.

The corrosion inhibition efficiency of mineral compound phosphate-bismuth has been investigated using potential dynamic polarization and electrochemical impedance spectroscopy (EIS). The results showed that the inhibition efficiency decreased with the inhibitor concentration and the temperature. Polarization studies revealed that mineral compound phosphate-bismuth acts as a mixed type inhibitor. The inhibitor adsorption on the steel surface obeyed the Langmiur isotherm and the thermodynamic parameters (Kads, ΔG0ads) were calculated and discussed. The corrosion process in1.0 M HCL in the absence and presence of mineral compound phosphate-bismuth followed first-order kinetics. Activation parameters of the corrosion process (Ea, ΔHa and ΔSa) were also calculated from the corrosion rates.



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Biography

Author's has her expertise in Materials and Corrosion Science. He was registered her PhD in 2016 at Ibn Tofail University, Morocco.

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Simultaneous removal of some heavy metals from the Marrakech municipal discharge: effect of pH, particle size, ratio extraction-soil solution and agitation time on the removal efficiency of pollutants

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Abstract

The main purpose of this work is to optimize the efficiency of simultaneous removal of four heavy metals from the soil of the municipal Marrakech's dump. Heavy metals became a great concern for scientists due to their harmful action on the environment and human life. The chelating ability of EDTA and NTA solutions 10^{-2}M is used to assess the ETM soil contamination. The effect of pH, agitation, soil contact time with solution, soil solution ratio, and particle size were investigated using the design of the experiment methodology: pH was the factor the most influential while the ratio of soil solution and particle size were of equal importance. However, the optimal contact time was about 30 minutes, except for zinc where the amount of metal extracted decreases over time probably due to competition with other metals.

The simultaneous removal of Cd, Pb and Cu has been optimized using EDTA under pH conditions of 4, sol solution ratio of 1 g per 20 ml of solution and stirring contact time of 34 min and particle size of less than or equal to 1 mm. Zinc must be removed separately under the following conditions: NTA as ligand, pH equal to 6, particle size greater than 1 mm and solution soil ratio of 5 g per 20 ml.

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ADSORPTION DES TENSIOACTIFS CATIONIQUES SUR LA BENTONITE ET ECHANGE IONIQUE

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Abstract

Les argiles peuvent être considérées comme des adsorbants qui répondent à la problématique environnementale posée par l'utilisation de produits chimiques toxiques dans de nombreuses industries (textile, peinture, agrochimiques et agroalimentaires…)et reçoivent une attention particulière grâce à leur abondance et leur faible cout par rapport à d'autres matériaux adsorbant. Dans notre étude, nous avons étudié l'adsorption des cations organiques et plus précisément les tensioactifs cationiques, cette étude a été renforcée par la modélisation des isothermes d'adsorption selon un modèle basé sur l'échange cationique entre l'adsorbant et l'adsorbant. Au cours de ce travail, nous avons montré qu'il existe une très bonne corrélation entre les résultats expérimentaux et théoriques dans le cas du BM (Figure 1). Ainsi les résultats sont en accord avec la littérature et le mécanisme d'adsorption est bien un échange cationique pour un taux d'adsorption inférieur ou égal la capacité d'échange cationique (CEC) de l'argile. Pour le tensioactif le chlorure de cétylpyridinium (CPC) et après l'échange, l'adsorption correspond à une adsorption par les interactions latérales entre les chaines alkyles. Ceci est confirmé par l'étude de l'adsorption de la tête polaire de l'hydrochlorure de pyridinium (PHC), pour lequel l'adsorption s'arrête à la CEC. Ensuite, nous avons étudié l'influence ducoion sur l'adsorption des tensioactifs, les résultats obtenus montrent que la quantité maximale d'adsorption augmente en passant d'un co-ion Cl^- à Br^-. Enfin, nous avons abouti à calculer par un modèle d'échange les coefficients de liaison des tensioactifs tels que le chlorure de cétylpiridinium, le bromure de cétylpiridinium et ses têtes polaires, l'hydrochlorure-pyridinium et l'hydrobromurepyridinium.

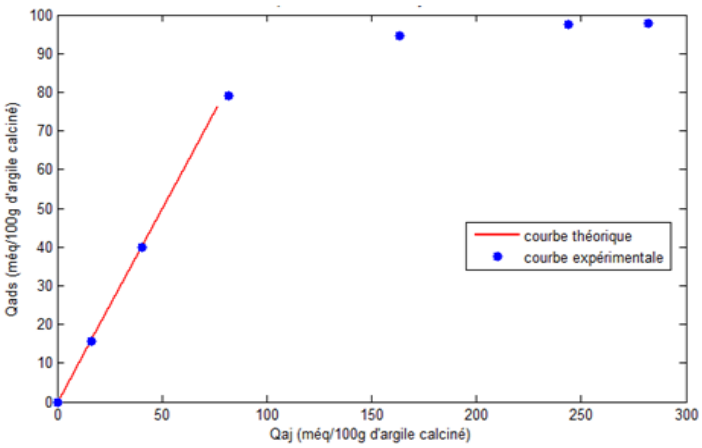

Figure 1 : Isotherme d'adsorption de bleu de méthylène sur la Na-bentonite corrélé au modèle d'échange

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Optimization of Fenton's oxidation of landfill leachate using the response surface methodology

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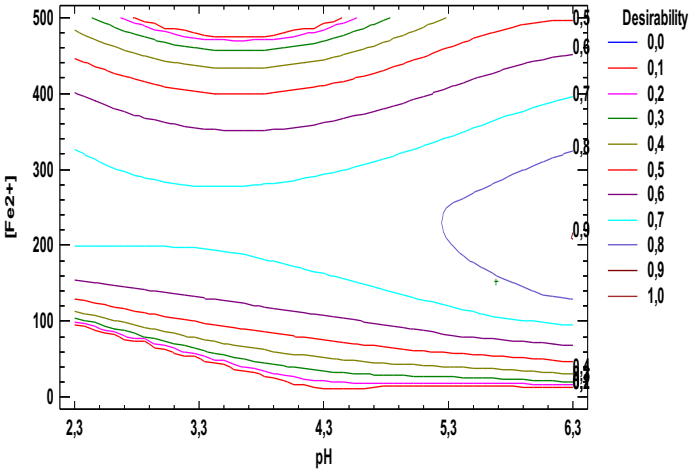
Abstract

Landfill leachate is a complex wastewater, and it always contains high concentration organic pollutants. The most popular treatments of landfill leachate in the past were biological treatments. However, the biological treatments were known to be inadequate in handling such a difficult treatment task, because the refractory organic pollutants in landfill leachate inhibited the biomass activity and/or were recalcitrant to biodegradation. Recently, Fenton process has been widely used to treat landfill leachate.

The efficiency of Fenton reagent (Fe^{2+} + H_2O_2+ H^+) for the leachate generated from Médiouna sanitary landfill site, located in Casablanca, Morocoo, was evaluated. Central composite design (CCD) and response surface method (RSM) were applied to evaluate and optimize the interactive effects of three operating variables, initial pH, dosages of Fe^{2+} and $[H_2O_2]/[Fe^{2+}]$ ratio on oxidative performances of Fenton process. Three target responses such as chemical oxygen demand (COD) removal, removal color and removal to sludge, were either directly measured as responses. The effective variables included the initial pH, Fe^{2+}dosage and $[H_2O_2]/[Fe^{2+}]$ ratio. The optimum operational conditions obtained were found to be initial pH of 5,68, $[Fe^{2+}]$ of 153,33 mM and $[H_2O_2]/[Fe^{2+}]$ ratio of 18,41. Under this optimal scheme, the COD, color and removal to sludge were reduced to 87,34%, 99,51% and 16,97 g/L., respectively.



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Biography

I am a PhD student at the HASSAN II University Faculty of sciences Ain chock. My research focuses on the treatment of industrial waste sludge and fresh/mature landfill leachate by the Fenton process. I published 2 papers in Journal of Materials and Environmental Science. My H-index is 1 on Scopus.

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Feasibility of a database of physicochemical components of Moroccan inland wetlands: impact of heterogeneity of measurement methods

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Abstract

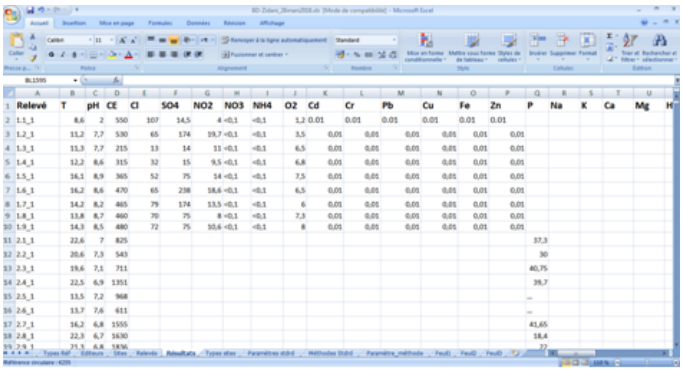
Water quality became one of the most prominent occupations in all countries, especially because of the continuous increase of pollution, which constitutes a real threat to future generations (cancer, mutations, sterility, disorders of the nervous system, intellectual deficiencies, etc.).

Thus, the number of researches and surveys dedicated to water physicochemical components in Morocco is relatively high; however, most of them are punctual (both in space and time) and cover never the whole country. The majority of data come also from polluted waters, and only some ecological researches concern natural waters (mainly in unpopulated zones).

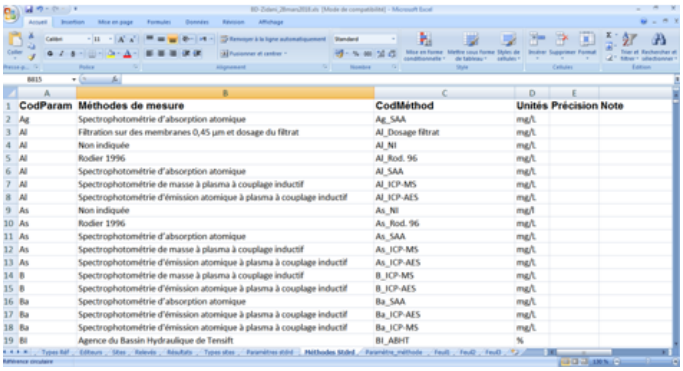
In most references, measurement methods and equipment are explicit. However, for several parameters, different methods are used depending on the different institutions and purposes, and this makes doubtful the comparability of some data. In rare cases, methods are not even mentioned.

In this bibliographic study, data on a total of 63 parameters could be found, but for very few parameters only we may obtain a spatiotemporal variation model, which never cover the whole country.

In conclusion, the exploitation of existing data on physicochemical components of inland waters do not permit to produce national models or synthetic images on these components. Thus, there is a clear need to develop a monitoring system of these components, based on standardized methods and tools. Our actual work is focused on a proposal of such standards.



Relevé	T	pH	CE	Cl	SO4	NO2	NO3	NH4	O2	Cd	Cr	Pb	Cu	Fe	Zn	P	Na	K	Ca	Mg
1.1_1	8,6	2	550	107	14,5	4	<0,1	<0,1	1,2	0,01	0,01	0,01	0,01	0,01	0,01					
1.2_1	11,2	7,7	530	65	174	19,7	<0,1	<0,1	3,5	0,01	0,01	0,01	0,01	0,01	0,01					
1.3_1	11,3	7,7	215	13	14	11	<0,1	<0,1	6,5	0,01	0,01	0,01	0,01	0,01	0,01					
1.4_1	12,2	8,6	315	32	15	9,5	<0,1	<0,1	6,8	0,01	0,01	0,01	0,01	0,01	0,01					
1.5_1	16,1	8,9	365	52	75	14	<0,1	<0,1	7,5	0,01	0,01	0,01	0,01	0,01	0,01					
1.6_1	16,2	8,6	470	65	238	18,6	<0,1	<0,1	6,5	0,01	0,01	0,01	0,01	0,01	0,01					
1.7_1	14,2	8,2	465	79	174	13,5	<0,1	<0,1	6	0,01	0,01	0,01	0,01	0,01	0,01					
1.8_1	13,8	8,7	460	70	75	8	<0,1	<0,1	7,3	0,01	0,01	0,01	0,01	0,01	0,01					
1.9_1	14,3	8,5	480	72	75	10,6	<0,1	<0,1	8	0,01	0,01	0,01	0,01	0,01	0,01					
2.1_1	22,6	7	825													37,3				
2.2_1	20,6	7,3	543													30				
2.3_1	19,6	7,1	711													40,75				
2.4_1	22,5	6,9	1351													39,7				
2.5_1	13,5	7,2	968													...				
2.6_1	13,7	7,6	611													...				
2.7_1	16,2	6,8	1555													41,65				
2.8_1	22,3	6,7	1630													18,4				
2.9_1	21,1	6,8	1836													22				



CodParam	Méthodes de mesure	CodMéthod	Unités	Précision	Note
Ag	Spectrophotométrie d'absorption atomique	Ag_SAA	mg/l.		
Al	Filtration sur des membranes 0,45 µm et dosage du filtrat	Al_Dosage filtrat	mg/l.		
Al	Non indiquée	Al_NI	mg/l.		
Al	Rodier 1996	Al_Rod. 96	mg/l.		
Al	Spectrophotométrie d'absorption atomique	Al_SAA	mg/l.		
Al	Spectrophotométrie de masse à plasma à couplage inductif	Al_ICP-MS	mg/l.		
Al	Spectrophotométrie d'émission atomique à plasma à couplage inductif	Al_ICP-AES	mg/l.		
As	Non indiquée	As_NI	mg/l.		
As	Rodier 1996	As_Rod. 96	mg/l.		
As	Spectrophotométrie d'absorption atomique	As_SAA	mg/l.		
As	Spectrophotométrie de masse à plasma à couplage inductif	As_ICP-MS	mg/l.		
As	Spectrophotométrie d'émission atomique à plasma à couplage inductif	As_ICP-AES	mg/l.		
B	Spectrophotométrie de masse à plasma à couplage inductif	B_ICP-MS	mg/l.		
B	Spectrophotométrie d'émission atomique à plasma à couplage inductif	B_ICP-AES	mg/l.		
Ba	Spectrophotométrie d'absorption atomique	Ba_SAA	mg/l.		
Ba	Spectrophotométrie d'émission atomique à plasma à couplage inductif	Ba_ICP-AES	mg/l.		
Ba	Spectrophotométrie d'émission atomique à plasma à couplage inductif	Ba_ICP-MS	mg/l.		
Bl	Agence du Bassin Hydraulique de Tensift	Bl_ABHT	%		

Biography

Omkeltoum ZIDANI is a doctoral-student, working mainly on physicochemical components of wetlands at the national level, both at the Faculty of Science and Technology of Fez and The Scientific Institute of Rabat. She is undertaking an inventory of bibliography on abiotic factors in wetlands and filling a database on physicochemical data on Moroccan wetlands. She presented different papers on these topics, most of them being on press.

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Treatment of Tamlest's leachate by electrocoagulation

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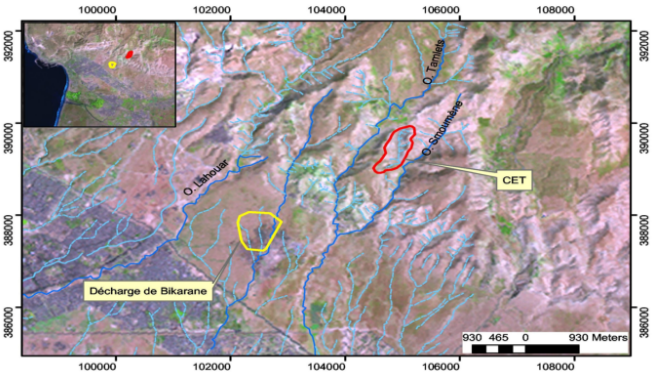
Abstract

The establishment of a technique for the treatment of leachate generated by the landfill centers is a necessity for the protection of the environment, in particular the groundwater.Leachate is difficult to be treated to satisfy the discharge standards for its variable composition and high proportionof refractory materials[1].Many treatment methods have been used to treat the leachate, such as advanced oxidationtechniques, membrane processes, biological processes, coagulation–flocculation methods and so on[2]. Electrocoagulation (EC) is a simple and efficient electrochemical method for the purification of water andwastewaters[3-5]. In this paper, treatment of leachate by electrocoagulation (EC) has been investigated in a batch process. The sample of leachate was supplied from Tamelest Center in Agadir (Fig.). In this center, the basins for leachate storage are already filled upstream. These leachates are characterized by low biodegradability. The use of physico-chemical treatment methods is necessary.

The effects of process variables such as electrode material, current density, pH and operating time for EC process are investigated on chemical oxygen demand (COD)and optical density (OD)removal efficiencies. The COD and OD abatement rates obtained from the trials show the effectiveness of this method. The appropriate electrode type search for EC provided that aluminum supplies more COD removal than iron electrode at the end of the 30 min operating time.The reduction of the organic charge in some cases reached 95.5%. All the findings of the study revealed that treatment of leachate by EC can be used as a step of a joint treatment.



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Biography

Author has her experience inconventional and no conventional methods of waste water treatment. Her focus is based on the use of the adsorption the photocatalysis methodsin the treatment of polluted water. He was warded her PhD in 2000 from the University of Ibn Zohr Morocco. He published more than 15 papers.

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Efficient of solar photocatalytic based on supported TiO_2 for removal of basic dyes from water

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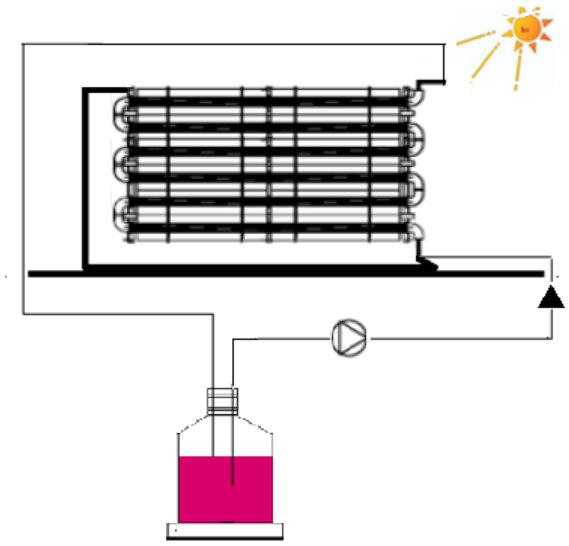
Abstract

The elimination of pollutants, such as dyes, from contaminated water is an extremely complex problem because of the wide range of structures and multiple compounds chemical properties. Among the nonconventional methods of treatment of polluted water, heterogeneous photocatalysis, based on the production of OH◦ radical active species responsible for the destruction of organic pollutants, has been used to treat several pollutants such as pesticides [1]. TiO_2 has been reported as one of the most efficient and promising photocatalyst [2, 3]. The use of artificial light, for treatment of waste waterin large volumes,could lead to excessive costs, which makes it necessary to use natural light, such as source of energy. Solar photocatalysis is a process based on solar energy (abundant and renewable), which also has an economic and environmental aspect. Several studies in solar photocatalysis have already shown the effectiveness of sunlight [4, 5].

For this study, a photocatalytic reactor based on Plexiglas tubes was manufactured. This reactor, equipped with a pump allowing the recirculation of the treated solution, was used to study the photocatalytic degradation of the basic yellow dye. The results showed that the decoloration rate was very high under basic conditions (pH = 9). Photocatalytic degradation under solar irradiation, even at high dye's concentrations, conducted to a satisfactory degradation rate (over 91%). The COD abatement remains less efficient. The effect of reusing the supported catalyst was examined. We have shown that this catalyst retains its capacities even after several cycles of use. In conclusion, the sunlight can be used as a source of activation of photocatalysts such as TiO_2, thus leading to the degradation of pollutants in solution.



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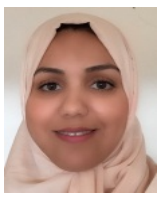
Biography



Author has her experience inuse of advanced oxidation processes. Her focus is based on the use of photocatalysis to have application in waste water treatment. She published more than 20 papers in several conferences.

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The degradation of the water resources of the urban community of Fez: an economic and environmental cost

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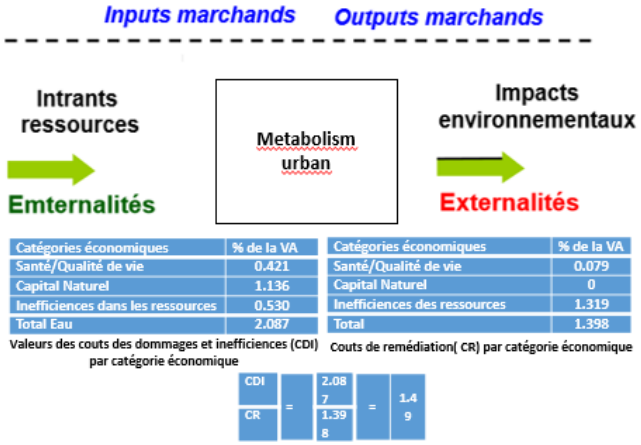
Abstract

A Meso study is the economic assessment of environmental degradation at the level of an economic sector or an urban community. It aims to link the micro (production unit) and macro (country) assessments to a medium level (sector), the Meso level. The objective of Meso economic studies is to capture and measure the order of magnitude of flows, to account them together with their transformations and impacts on the environment. Then, the consequences of these actions are estimated monetarily in terms of the cost of environmental degradation and remediation costs. Finally, these values are expressed in relation to the value added of the entity concerned. The choice of the city of Fes, the thousand-year-old spiritual capital of the Kingdom, to make this study is justified by the fact that this urban community has recently eknowna strong demographic growth, accompanied by an important urbanization and an accelerated industrialization, the combination of which inevitably leads to overexploitation of the waters and also to the deterioration of their qualities.

Despite the remarkable progress of the city of Fez in the field of the protection of the environment, precisely the water resources, by the realization of the purification station, there are still problems that cause serious negative impacts on the environment. health, the quality of life and without forgetting the economy of the city.

The main objective of this study is to estimate the economic cost of water degradation and inefficiencies in the use of water, then to identify the cost of the remedies likely to avoid this degradation and these inefficiencies.It thus makes it possible to estimate the ratio between the benefits and the costs of remedial actions and to identify priorities for decision-making.



Catégories économiques	% de la VA
Santé/Qualité de vie	0.421
Capital Naturel	1.136
Inefficiences dans les ressources	0.530
Total Eau	2.087

Valeurs des couts des dommages et inefficiences (CDI) par catégorie économique

Catégories économiques	% de la VA
Santé/Qualité de vie	0.079
Capital Naturel	0
Inefficiences des ressources	1.319
Total	1.398

Couts de remédiation(CR) par catégorie économique

CDI	=	2.087	=	1.49
CR		1.398		

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Biography

Bassma ANTOUH, PhD student in fourth year at the doctoral study center "Sciences and Technologies" to prepare a doctoral thesisentitled:"Meso-economic analysis of the environmental costs and benefits of the urban community of Fes".under the supervision of Professor Mr. Mostafa EL QANDILat the Geosystems Environment and Sustainable Development laboratory at the Faculty of Sciences Dhar El Mahraz - Fes, Sidi Mohamed Ben Abdellah University.

The efforts made in this subject have given rise to numerous communications in national and international congresses like:

1st Euro-Mediterranean Conference for Environmental Integration (EMCEI), Sousse, Tunisia.

First International Congress of Water and Environment Studies, Al Hoceima, Morocco.

4th International symposium"Water Recycling and Valorization of Waste", Al Akhawayn University of Ifrane Morocco.

and other.

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Behaviour of partially encased composite columns filled with slag concrete

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Abstract

The present work describes the test program performed on forty nine 100x75 mm partially encased composite column to bring some lights on the behaviour of such composite sections partially-encased, and to study the possibility of using thin-walled short steel columns filled with slag concrete subjected to axial compression. Also, to provide some evidences that the use of crushed slag could be integrated in the manufacturing of non-conventional concrete. The crushed crystallized slag brought from iron manufacture EL HADJAR-ALGERIA- , can be recognized as a new kind of concrete construction, in witch broken piece of crystallized slag are used as aggregate. The use of such industrial waste can save natural resources and protect our living environment. A total of 10 stubs were tested under axial compression. The columns are divided in two groups. In the first group, A total of 4 stubs were tested, 2 were empty, 2 filled with slag concrete. In the second group, a total of 6 columns partially filled by the slag concrete, 4 columns had shear connecters welded along the centreline of the web, and 2 had steel rods welded between the tips of opposing flanges on both sides. According to these results, we concluded that the bearing capacity was increased with the addition of shear connectors and local-buckling resistance of the flanges was increased with the addition of the transverse link. More experiment is needed to investigate the effect of the spacing of the transverse link on increased confinement for concrete and the mode steel local-buckling, of partially slag concrete filled thin welded steel stubs.

The failure mode of partially encased composite column

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Biography

Based on the results of the research program, the following recommendation is given: Additional testing should be carried for partially encased composite column made with thin-walled, welded I-section, be stiffened with transverse links for assure a better confinement of the concrete near the exposed face, for avoid brittle column failure and the use of additional reinforcements can improve the post-ultimate load behaviour.

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Study of corrosion inhibition of ordinary steel in 1M HCl medium by a new vitreous compound

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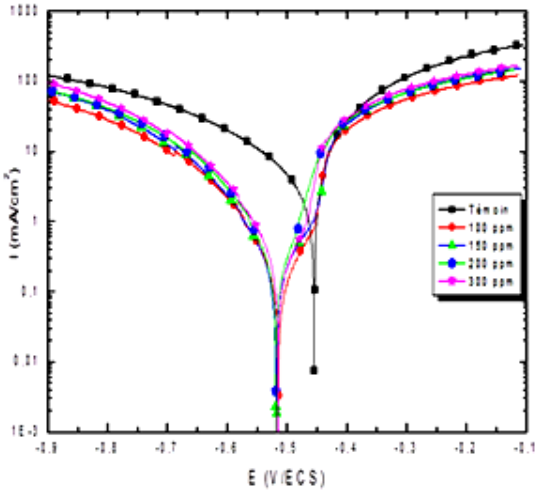
Abstract

Corrosion is the degradation of the material by chemical or electrochemical reaction with the environment, it undergoes a progressive loss of material at the points of contact with the surrounding environment. This definition recognizes that corrosion is a deleterious phenomenon, destroying the material and reducing its properties, rendering it unusable for an intended application. The use of inhibitors is the most practical method for protecting metals against corrosion.

Our work is focused on the study of the effect of a borate glass-based glass phase on the inhibition of steel corrosion in a 1M HCl solution at room temperature and at different concentrations; the electrochemical study was carried out by stationary polarization and electrochemical impedance. The tests confirm that the rate of corrosion decreases as the concentration of the compound reaches the value of 100 ppm; According to this result, this compound is proven effective in limiting corrosion damage with an acceptablely fine.



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Biography

H.EL BOULIFI was trained in electrochemistry and corrosion. Its purpose is based on the use of vitreous compounds to have an inhibition in the field of corrosion. She is a 2nd year PhD student at ibn Tofail University, Faculty of Science, Kenitra, Morocco.

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In quest of reducing the environmental impacts of wiring harness production with using LCA method

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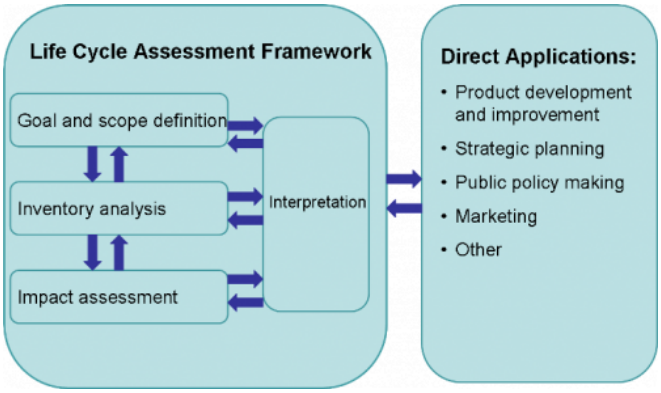
Abstract

Environmental impact assessment methods are now widely used in order to measure environmental impacts associated with human activities (for products, services, and systems). Life-cycle assessment (LCA) is without doubt the foremost assessment method to identify and quantify the process flows and systems that are major contributors to environmental degradation. LCA has major roles in environmental impact assessment, integrated waste management and pollution studies. According to the ISO 14040 and 14044 standards, a Life Cycle Assessment is carried out in four distinct phases as illustrated in the figure 1.

The aim of this work is to allow the evaluation of the environmental impacts related the production of wiring harnesses. The realization of this orientation is to compare the pressure of this product on resources and the environment throughout its life cycle, from the extraction of raw materials to its end-of-life treatment. All the inputs and outputs occurring in the life cycle of the system are inventorying to perform a quantitative description of all flows and materials and energy across the system boundary either into or out of the system itself.

The goal of LCA is to compare the full range of environmental effects assignable to products and services by assessing how these material flows affect the environment.This information is used to improve processes, support policy and provide a sound basis for informed decisions.



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Biography

Author is an early career researcher engaging in this research project while applying this theory in a multinational company. She has passed two papers in international congresses successfully.

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Biodiversity and groundwater ecology of two remote regions and palaeogeographical implications: the central Rif and the Tafilalet plain

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Abstract

The biodiversity is currently a major stake of research in ecology, both concerning its role in ecosystems, its determinism and its valorization in the field of the preservation of the environment (1).Stygobiological research, devoted mainly to the fauna and ecology of groundwater, has developed remarkably in Europe (2-4), then in America (5, 6), Asia (7).On the African continent, while work on subterranean aquatic fauna is still relatively limited south of the Sahara, it has experienced considerable growth in the Maghreb (8). Our present study completes the research already carried out in the field of hydrobiology, focusing on the Central Rif region and the Tafilalet region (North and Southeast Morocco), whosestygofauna was still largely unknown. Our study aims to investigate and clarify the relationship that may exist between the water quality of wells and springs and the diversity of aquatic fauna present in these habitats. For this, several stations (well and source) were the subject of our study of the quality of the water and a sampling of the fauna. Thus, the choice of stations is selected according to several basic criteria.Species encountered in the Central Rif region are discussed in its paleogeographic context of the two regions.

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Biography

Said BENYOUSSEF, PhD student in 2nd year at the Faculty of Science and Technology, Errachidia, Morocco. My research subject is, the Biodiversity and groundwater ecology of two remote regions and palaeogeographical implications: the central Rif and the Tafilalet plain. This research is done with CNRST support.

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Agro-morphological behavior of saffron under the environmental conditions of four areas in eastern Morocco

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[1] Laboratory of Biology of Plants and Microorganisms, Faculty of Sciences, Oujda, Morocco.
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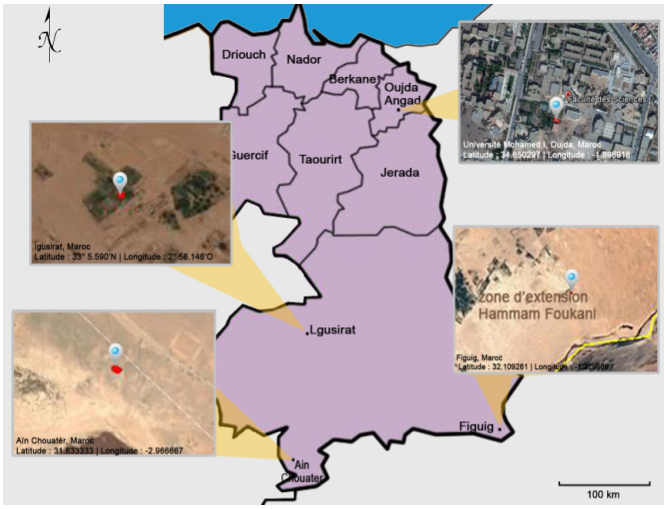
Abstract

Saffron (Crocus sativus L.; Iridaceae) is the most expensive spice in the world. It has been cultivated in Morocco for centuries and has represented a traditional staple for culinary, medical and cosmetic uses. Given the importance of this species and in the framework of the Green Morocco Plan, particular attention has been paid to the development of the saffron sector through the search for favorable areas to the introduction of saffron cultivation. In this vision, the present work aims to evaluate the agro-morphological behavior and the quality of the stigmas of saffron plants in the natural conditions of semi-arid climate by choosing four sites with contrasted climate namely: Oujda, Figuig, Ain chouater and Lagusirat. To reveal the adaptation of saffron, agro-morphological and physicochemical parameters were studied. The results shows that there is an overlap of flowering depending on the zones. Lgusirat and Ain Chouater are the earliest areas. The parameters related to the quality of the stigmas show that the latter are whole and with a very intense color in all zones studied, while the length is variable from one sample to the other, with average values between 1.26 cm to 2.50 cm. The comparison of the stigma content in crocin, picrocrocine and safranal shows that the saffron of Lgusirat has a medium coloring and aromatic power and a strong taste power. Similarly, the classification of samples according to Moroccan standard 08.1.037 / 2007 reveals that only Lgusirat saffron belongs to category III, while that of other regions is outside the norm.



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Biography

PhD student at Laboratory of Biology of Plants and Microorganisms, Faculty of Sciences, Oujda, Morocco. A master's degree in Horticultural and Landscape Engineering. Professor at the agricultural qualification center in Taourirt. Vice President of the Moroccan Horticultural Association (AMH).

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Treatment of wastewater by material based on dates rods

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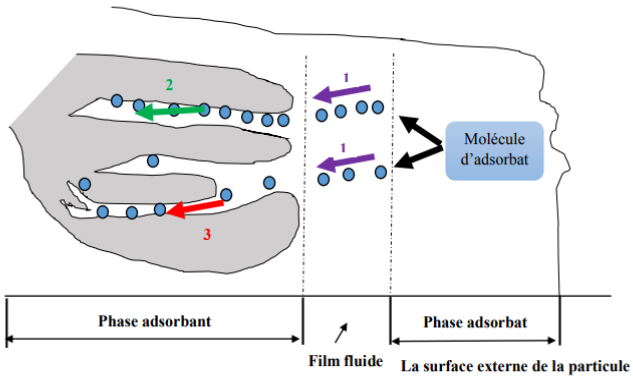
Abstract

With the growth and development of the industry, the problem of pollution remains the most important subject of many scientists, since it affects several vital sectors. In this work, we focus on the treatment of water polluted with chemicals that can cause various health problems. For example, phenols and heavy metals are a major source of pollution, and are mainly the result of industrial wastes such as plastics, polymers, insecticides....
In this context, the adsorption is a very effective industrial technique for eliminating these unwanted compounds in water. The objective of this study is to improve the adsorption capacity of a plant material, i.e. dates rods by using the activation process which contributes significantly in the increase of surface area and therefore the creation of active sites and the improvement of adsorption. The results show that the adsorbent derived from dates rods and activated by various acids (nitric, phosphoric, hydrochloric and sulfuric acid) at different concentrations does not behave in the same way towards the solutes. The best activation was obtained from pure sulfuric acid giving a maximum adsorption rate (97.99%) for copper ions with a burn-off equal to 77% for an adsorbent mass of 2g and a volume of bulk solution of 25mL. On the other hand, it has been proved that the adsorbent is more selective for copper ions than phenol molecules; contained both in solutions whatever the activating agent.



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Treatment of leachates in the dump of the Great Agadir: Comparative Study

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Abstract

Leachate, the liquid percolating through solid waste, remains a major concern for managers of new controlled landfills in Morocco. The urban waste disposal center of Agadir is one of these landfills built according to European standards with impermeable systems for collecting membranes and leachates. After few years of operation, relevant stakeholders are now confronted with the major challenge related to quantitative and qualitative issues of leachate.

Indeed, since its commissioning in 2010, the effluents are stored in large basins because their pollutant load does not allow their discharge into the receiving environment, due to the lack of adequate treatment. Thus, the purpose of this paper is to choose a leachate treatment technique for the public landfill of the Greater Agadir. This work involves a comparative study of different leachate treatment methods; to list the characteristics and cite the advantages as well as the disadvantages of each method; then, to distinguish the most appropriate method for the treatment of leachates at the public dump of the Greater Agadir.

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Biography

Author is a Full Ph.D. student at the Faculty of Science, Ibn Zohr University, Agadir; Morocco. She was awarded her master in 2014 on the subject "Engineering and Environmental Management in an Industrial Environment", from the University of Abdelmalek Essaadi Tangier Morocco. She is interested in Municipal Solid Waste Management, Leachate Treatment, Pyrolysis and Renewable Energy. She has published articles on these topics in conference proceedings.

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Valorization of ethnobotanical patrimony of Bigoudine watershed region (Moroccan Western High Atlas)

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Abstract

The region of the Bigoudine watershed (Western High Atlas) has an important biological diversity offering economic, ecological and social potentialities vital for the local population. The region, submetted to very difficult climatic and orographic conditions, is occupied by a poor population with a very high illiteracy rate. An ethnobotanical study, carried out in this area, made it possible to highlight the different uses of plants in traditional medicine, as well as their impacts on the degradation of vegetation and the surrounding flora. Ethnobotanical investigation conducted in 2003-2004 and updated in 2016-2017, identified 258 medicinal and aromatic species used by the local population in traditional medications, including more than 50 spontaneous species collected in the region of the Bigoudine watershed. The results of the study showed that the most used part of the plant material is the leaf, as well as the majority of remedies that are prepared as a decoction. However, this plant material used in daily traditional care and in many informal commercial activities can cause significant human pressures. These pressures, caused by the population on this local natural wealth, threaten some of the most exploited medicinal and aromatic species in the area such as : *Thymus satureioides* Cosson, *Thymus pallidus* Coss.ex Batt, *Lavandula dentata* L., *Salvia aucheri* Benth., *Globularia alypum* L., *Pistacia lentiscus* L. and *Cistus villosus* L.

Finally, this study has shown that living conditions within the study area are the main causes of overexploitation of natural resources and its sustainable regeneration. It is therefore urgent that the local medicinal plant heritage must be preserved in its diversity and in its natural extent through a sustainable management approach.

Key words: Medicinal and aromatic plants, Ethnobotanical investigation, Basin Versant de Bigoudine, Western High Atlas, Morocco.

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Biography

Author is an administrator within the State Secretariat in Charge of Sustainable Development Rabat. He supported his doctorate at the University Med I, Faculty of Sciences Oujda in 1995. The author is interested in the protection of the environment and scientific research in the following disciplines: ethnobotany of medicinal and aromatic plants and biodiversity vegetable.

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Treatment of food dyes liquid waste by Fenton and Electro-Fenton processes

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Abstract

The food dyes industry generates persistent effluents and highly colored. Their pollution is more aesthetic than environmental. Hence, the appropriate treatment technique should not form more hazardous by-products [1]. Over the past decade, many researches have focused on a new category of oxidation techniques like advanced oxidation processes (POA) [2]. These technologies have already shown their efficiency in the treatment of toxic organic pollutants [3,4]. These technologies are based on the production of a powerful, highly reactive and non-selective oxidant, the hydroxyl ($^{\bullet}OH$) radical, which allows the oxidation of toxic and persistent organic pollutants until total mineralization. [5].

In this context, we were interested in the characterization of an industrial waste containing a red azo dye Carmoisine/ Azorubine and the possibility of its treatment by the advanced oxidation process Fenton (Fe^{2+} / H_2O_2) and Electro-Fenton. The results of the treatment, optimization of the various parameters (current density, concentration of ferrous ions, electrolysis time, kind of electrodes) and identification of products issued from the processing operation of the solution are presented and discussed.

Keywords: Azo dye, advanced oxidation process, Fenton, Electro-fenton.

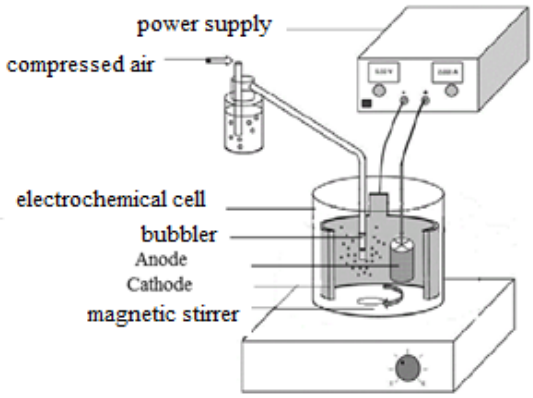

Figure: *Experimental set-up for electro-Fenton experiments.*

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Biography

PhD student in environmental chemistry from the University Hassan II, Casablanca. I have published 2 papers in international Journal.

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The health establishment as an environmental company: rational and sustainable management model "Case of CHPMdiq"

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Abstract

The environment is among the worrisome questions of our time seen its irreversible character. This transnational question is multi-stakes for societies, shows of it the regression of the environmental wealth which goes to peer with the growth of the syndrômeNYMBY. Among the polluting companies, we find health-care establishment which are transformed today, in producers of specific waste obliged to treat them in a rational and effective way. Of actors' posture of health worried about a good hygiene for the protection of the population and about the environment, since 1992, ministerial directives were transmitted to the public hospitals to solve the situation of the medical and pharmaceutical waste. The legal framework of the DMP in Morocco knew big evolutions thanks to the adoption of the legislative and statutory texts. Besides the sanitary and environmental standards remain little binding and are a matter of the soft low. Their application comes up against resistances (cultural, social, and technical), consequently, the protocols of management of the DMP are little respected to see broken. On the basis of an experiment led between 2013-2015, we suggest discussing the health-care establishment as undertaken submitted to a new managerial mode, and entity was subjected to the civic, environmental and penal responsibility. The health-care establishment has to be a model of hygiene by minimizing the risks connected to its internal and external environment. So how a health-care establishment can become a «environmental company "?

Biography

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Mouna Saihi Professeur au centre de recherche sur l'action locale, UFR Droits sciences politiques et sociales, ERASM, Université Paris. France.
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Improvement Of The Fergoug Dam Vase Treated By Lime

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Abstract

The siltation of the dams is undoubtedly the most dramatic consequence of the problem of erosion in Algeria. The investigations are at two levels: either to prevent the solids to arrive in the reservoir, there is to put obstacles to break the forces of the runoff water but we can only hope partial results. The second solution is the evacuation of sediments by appropriate management of bottom organs and dredging devastation which requires the use of external energy. But in view of the large quantities of siltation sediments, we have found it necessary to seek to make the recovered vases profitable in order to amortize the cost of the devastation.
In order to solve this problem, mud treatment methods are often used to improve the insufficient geotechnical properties before reuse for a certain function in the structure. The treatment of lime pots is one of the most common methods of transforming local natural and man-made soils into new materials with the desired performance.
The objective of this work is the study of the mud behavior of the Fergoug dam (Algeria) for the purpose of its use in the application in road engineering. The study consists of reconstituting samples of the mud + various proportions of lime in the laboratory, and subjecting them to various tests (Proctor, VBS, CBR index, DRX, etc.).
The results obtained are encouraging and allow a better future for lime-slaked mud.

Keywords: Vase of dams; Environment; CBR; valuation; Lime treatment.

Biography

Author has her expertise in evaluation and passion in improving the bone and cement used in dental medicine. Her focus is based on the use of natural phosphate to have application in health field. She was warded her PhD in 2006 from the University of Riems Champagne Ardenne French.

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Monitoring the physicochemical quality of surface water in eastern Morocco

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Abstract

The present work is a physico-chemical characterization of the water quality of the low Moulouya and its tributaries Cherâa-Zegzel. The interest of these waters lies mainly in the domestic and agricultural uses they provide; it is therefore advisable to follow their state of pollution. The presence of these rivers in protected areas establishes their ecological, scientific and socio-economic importance: RAMSAR, SIBE and Continental Wetland.To control the quality of the lower Moulouya and its tributary Zegzel-Cherâa , analyzes of physicochemical parameters were carried out monthly for one year (Dec-2015, Nov-2016) in five stations spread over the studied streams. Partial triadic analysis was used to address spatial typology and temporal stability of variables to understand the season-station interaction from four tables. The results obtained from the study of temporal typology, showed that the S4 station at Cherâais polluted during the four seasons, due to urban discharges spilling from the city of Berkane into the watercourse. This has been determined by the high values of the indicators of organic pollution (dissolved O_2, BOD5, NH4 ...). As for the S5 station at the Moulouya, although it receives these polluted waters, it remains of good quality thanks to the purifying power of running water (high flow), before flowing into the Mediterranean.

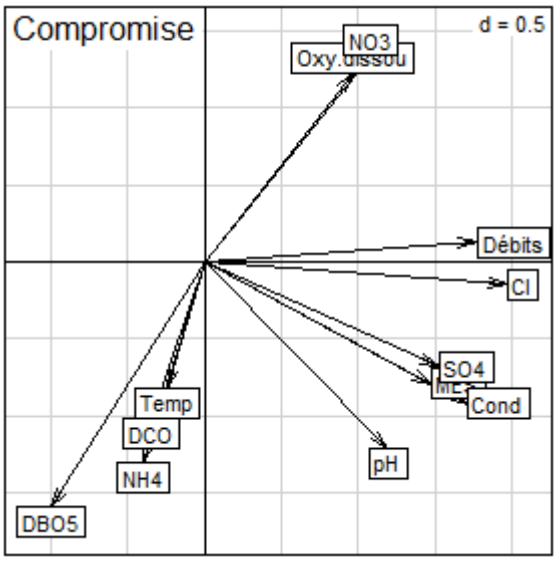

Figure 4: Results of interstructure and compromise from partial triadic analysis of physicochemical data. Variables coordinates onthe 1-2 plan of the compromise.

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Biography

Hind Derfoufi is currently o PhD student at University Mohammed I of Oujda, Morroco, Laboratory of Water, Environement and Sustainable Development were she is working on the characterization of the physicochemical and microbiological quality of rivers and on the study of the microbial community of surface waters.

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Occurrence of *Vibrio* species in Moroccan Atlantic coastal lagoons

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Abstract

Vibrio species particularly *Vibrio parahaemolyticus*, *Vibrio vulnificus* and *Vibrio cholerae* have a potential for human illness through consumption of raw or undercooked shellfish. The purpose of this study was to report their occurrence and seasonal abundance in shellfish, water and sediment of two Moroccan Atlantic coastal lagoons. The most frequently isolated *Vibrio* from 180 environmental samples were *Vibrio alginolyticus* followed by *Vibrio parahaemolyticus* and *Vibrio vulnificus*. Isolates of *V. parahaemolyticus* were investigated for virulence genes by polymerase chain reaction (PCR). The results showed the presence of *V. parahaemolyticus* but no pathogenic strains were detected and the presence of *Vibrio vulnificus*. In summary, our study highlight that the potential sanitary risk associated with the presence of pathogenic *Vibrio* in the two coastal lagoons is not significant.

Keywords: *Vibrio*; Pathogenic strains; Lagoons; Shellfish; Water; Sediment; Morocco.

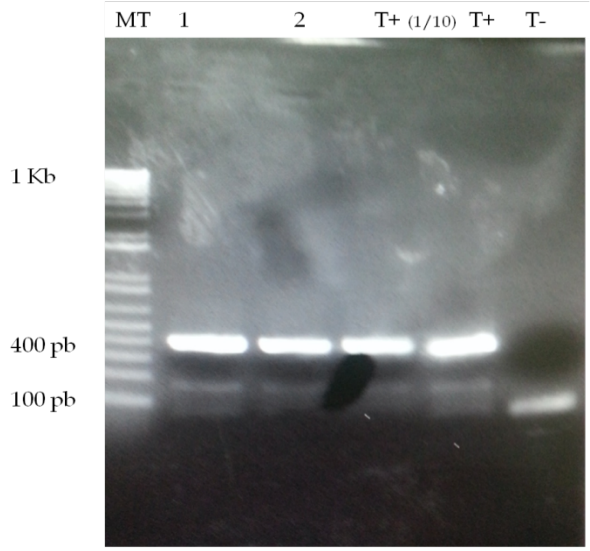

FIG. : Gel d'électrophorèse 1,5% : Amplification du gène spécifique de *V. parahaemolyticus* (séquence Pr72h de 387pb).

Biography

Smahane KODAD from Hassan II University in Casablanca, Morocco.
I am environmental microbiologist with six years of research experience in Morocco. My work includes the detection and characterization of marine pathogen (bacteria and virus) and their interaction with environmental parameters. The aim is to estimate the potential sanitary risk associated with the presence of pathogenic *vibrio* species in two Moroccan coastal lagoons.

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Oasis of East Morocco facing the challenges of bad weather: Study of the choice of local building materials in casbahs of Draa-Tafilalet

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Abstract

This study is particularly interested to Kasbahs of Draa-Tafilalet valleys in Morocco, whose earthen dwellings range from prehistory to the present day. The aim is firstly to determine the granulometric composition of these lands used in these constructions. For which we measured a certain number of the physicochemical parameters for each site. Secondly, we studied the chemical composition to explain the varied behaviors manifested by the bricks from these earths.

We have also tried to stabilize them in order to improve their mechanical characteristics (compressive strength, cohesion) by reducing the voids between the particles or by improving or creating bonds between them. Stabilization reduces the sensitivity to water (swelling and shrinkage) and permeability by sealing voids between particles, which improves the durability of these materials. The stabilization can be reached either by:

- Chemical way: chemical transformation allowing the formation of bonds between particles. The effects of stabilizers become sensitive only after a few days or weeks (cure time) and require specific conditions (shadow, humidity, etc.) to be achieved;
- Physical way based on two principles:
  - The change of grain size composition of the soil;
  - The creation of a structured framework.

We submitted the different earths to a series of tests. The results have shown that these earths possess interesting properties such as their density, porosity and water absorption. In addition, thermal tests reveal their important thermal insulation.

Keywords: Kasbahs; unbaked earth; thermal insulation; mechanical characteristics; water resistance; water absorption; granulometric composition; chemical composition; stabilizers.

Iodine content in groundwater of North Eastern Morocco and its relation with the incidence of goiter

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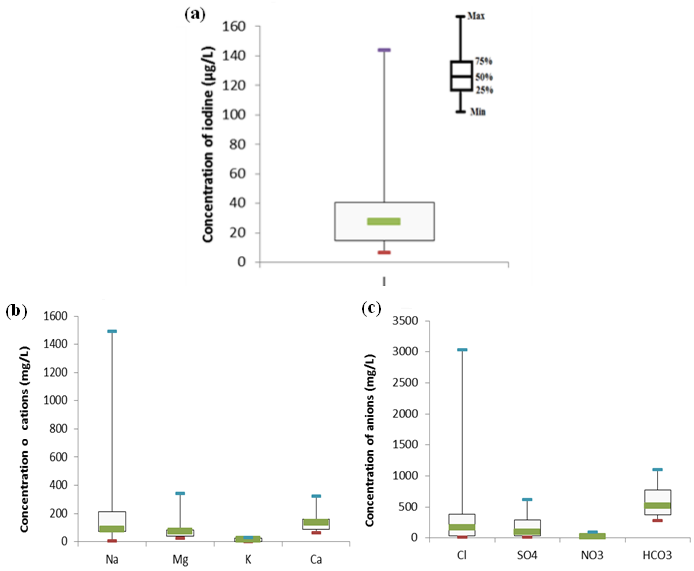
Abstract

Iodine in water has been used as an indicator of the 'iodine status' of an area, and it has been suggested that a low iodine content in drinking water is a contributing factor to the onset of Iodine Deficiency Disorders, which the most visible manifestation is goiter. The aim of the present study was to evaluate the importance of groundwater iodine content for the regional differences in goiter frequency observed in rural areas in the North Eastern Morocco where groundwater is the main source of drinking water.Water samples from 9 wells and 4 springs were collected and analyzed. Concentrations of iodine varies from 6.43µg/L to 143.8µg/L. the content was high in wells near the Mediterranean Sea (Bouareg: 115.9µg/L and Laatamna: 143.8µg/L), and the lowest values were in general noted in springs (mean 10.28µg/L). When only well waters were considered, Guenfouda showed a lowest value of iodine (14.6µg/L). This result may, in part, explain why goiter frequency is higher in this area.In order to understand the distribution of iodine and the controlling factors in groundwater from the North Eastern Morocco, hydrochemical study was conducted. Distance to the Mediterranean sea associated with topography, is probably the main explanation for this distribution and hence, the regional differences in goiter frequency observed in this area. The results in this investigation suggest the need to update data on iodine deficiency in the North Eastern Morocco and to recommend possible remediation strategies.



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Biography

Azzakhnini prepared her PhD at the faculty of Science, University of Mohammed premier Oujda Morocco. She will defend the thesis next June on the distribution of iodine in the Environment related to goiter cases in North Eastern Morocco.

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Evaluation of the vulnerability to pollution of aquifers in the coastal area of Essaouira (Essaouira, MAROC)

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Abstract

Groundwater remains the main water resource for consumption on potable water, irrigation in the agricultural field and for the use in industrial and touristic domains by inhabitants of cities and villages in the coastal areas with arid and semi-arid climate. In order to protect the groundwater table of the coastal zone of Essaouira, located in the west central part of Morocco, a study of the intrinsic vulnerability to pollution was tackled by the use of the Geographic Information Systems (GIS) from the DRASTIC method. This tool serve to highlight the problems of overexploitation and degradation of water quality and help decision makers to take good decisions to solve them. Vulnerability cards are fundamental documents for spatial planning. They represent excellent support for the establishment of all kinds of human activities taking into account the pollution of underground waters.

The analysis of the vulnerability map to the pollution of the Plio-Quaternary aquifer of the coastal zone of Essaouira, shows a heterogeneous variation in vulnerability across the area, with values of the DRASTIC index (ID) range from 45 to 149 spatially distributed in the study area according to four classes when it was determined by the reclassification of results, this vulnerability to pollution calculated by the standard DRASTIC method is essentially dependent on the depth of the groundwater table and the unsaturated zone. These two parameters have a very important influence compared to other parameters that make up this method.

Keywords: DRASTIC, Essaouira, water resource, vulnerability,groundwater, weter quality.

Biography

Author has her expertise in geosciences, environment and climate change. His focus is based on the use of hydrological and stochastic models of artificial neural networks in the field of environment and climate change. Hewas warded her PhD in 2015 from the Moulay Ismail University, Meknes, Morocco. He published 4 articles and participated in several national and international scientific events.

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Selective recovery of copper from waste printed circuit boards (PCBs) using glycine solution

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Abstract

Waste electrical and electronic equipment (WEEE) is considered to be one of the fastest growing waste streams in world, with an annual increase of 3 to 5% [1][2][3]. Consequently, the ever- increasing amount of WEEE has become a very serious common problem facing the world given the presence of a variety of toxic substances such as heavy metals and plastics which can contaminate the environment and threaten human health. On the other hand, this type of waste represents the source of valuable components, e.g. 0.1% Au, 0.2% Ag, 20% Cu and 4% Sn [4]. For comparison, the gold content in primary materials is 2–5g/t, which represents hundred times less than in WEEE [4]. It follows that WEEE should not be regarded as waste but as a valuable secondary raw material.

PCB is the essential parts of electronic devices and contains the major fraction of metals present in WEEE. Although the composition of PCBs varies depending on their age, origin and manufacturer, copper is one of the metals present in the highest amounts in these materials 10-30% [5].

Present work is focused on the selective recovery of copper from waste printed circuit boards (PCBs). Glycine was found as a suitable leachant to dissolve copperselectively. Initially, the effect of leaching time, temperature, agitation and initial concentration of glycine on leaching of copper were investigated. Then cyclic sweep voltammetry and chronoamperometry were employed to obtain information on electrochemical behavior of metals in the leaching solutions. Finally electrodeposition technique was applied in order to recover copper in powder form and several parameters were investigated in order to improve the current efficiency for the copper electrodeposition.

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Biography

Author is a PhD student in his fourth year of thesis at the faculty of sciences Aîn Chock at the university Hassan 2 of Casablanca. He works in a search team at the laboratory Interface Materials, Environment (LIME). His focus is based on the recovery of metals from waste electrical and electronic equipment (WEEE).

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A new chelating acrylic fibers for chromium ion removal

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Abstract

Purification of water contaminated with heavy metals ions is a major problem to solve. Hexavalent chromium is one of the most toxic metals used in industries and considered a threat for public health and environment. The purpose of this study was to prepare a new modification process of polyacrylonitrile fibers for Cr (VI) removal. Modification process was carried out using hydroxylamine hydrochloride to convert nitrile groups on fibers surface into amidoxime groups. The effect of solution pH, temperature, initial concentration and agitation time on the removal was examined. Batch experiments were performed in laboratory scale. Raw and modified acrylic fibers were characterized using FTIR and scanning electron microscopy. FTIR spectra show reduction in absorption peaks of nitrile groups due to the modification into amidoxime groups. Experimental data were analyzed by Langmuir and Freundlich adsorption isotherms. The maximum adsorption was found to be 90% at pH values of 3. Visible spectroscopy was used to confirm the ability of fibers to eliminate Cr (VI) from aqueous solution The results concluded that the modified acrylic fibers showed great ability to adsorb Cr^{6+} from aqueous solutions.

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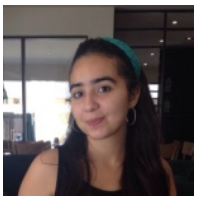
Biography



Bouchoum Hayat born and raised in Casablanca, Morocco. She is a PhD student in the department of chemistry and valorization from University Hassan II science faculty and higher school of textile and clothing, Casablanca, Morocco. Her research focuses on treatment of waste water charged by heavy metals ions using a low cost and efficacy adsorbent She is interested by environmental protection, reduce toxicity at source and sustainable development. She has a master's degree in management and waste recovery as well as a license in urban sanitation from University Hassan II, Department of chemistry.

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Assessment of heavy metal concentrations in seven Commercial marine Fishes caught in the Atlantic coast of Morocco and their associated health risks to consumers

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Abstract

The purpose of our study is to evaluate the health risk assessment of some heavy metals attributed to consumption of common edible fish species available for consumers. Concentrations of Cd, Pb, Cu, Fe, Zn, Ni and Cr were determined in muscles, gills and livers, of seven common edible fish species, namely (*Octopus Vulgaris Cuvier, on 1797, Sardina Pilchardus, Trachurus Trachurus, Palaemon Serratus, Sparus aurata, Dicentrarchus labrax and Solea Vulgaris*) caught in the Atlantic coast of Morocco, landed in the port of Casablanca during the autumn and spring of the year 2016. .Concentrations of heavy metals were determined by inductively coupled plasma- atomic emission spectroscopy (ICP-AES) and expressed as mg/kg of wet tissue. The data obtained in the present work were compared well with the counterpart data reported internationally. The estimated values of all metals in muscles of fish in this study were below the permissible limits. Generally, risk values for the measured metals do not pose unacceptable risks at mean ingestion rate for muscles. It can be concluded that the investigated metals in edible parts of the examined species have no health problems for consumers.

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Synthesis of fluorinated π conjugated oligomers through palladium catalyzed iterative C (sp2)-H bonds Arylations

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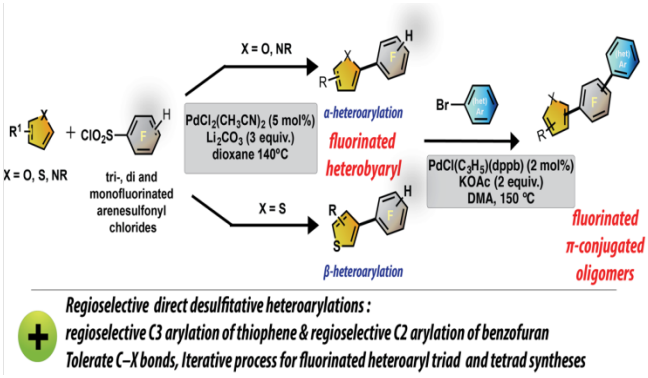
Abstract

The palladium catalyzed Direct C-H bonds arylation has appeared as one of the most sustainable protocols for the synthesis of poly (hetero arenes in high yields in only a few steps with the respect of the environment[1].

We developed a new strategy for the synthesis of fluorinated π Conjugated oligomers involving only palladium catalyzed iterative C-H bonds arylations. Palladium catalyzed desulfitative arylation of heteroarene with $PdCl_2(CH_3CN)_2$ and benzosulfonyl chloride as coupling partner allowed in the first step the synthesis of heteroarylated polyfluorobenzenes in highs yields [2]. The direct desulfitative arylation allowed the regioselective arylation of thiophene and Benzothiophene respectively at C2 and C3 position. Which are challenging positions to functionalize using aryl bromide as the coupling partners[3].

The next steps involve direct region-selective arylation with aryl halides catalyzed by $PdCl(C_3H_5)$(dppb) Furnish the desired triad or tetrad heteroaromatic compounds[4].



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Biography

Author has his expertise in synthesis of complexe and activities biologique, some logiciels theoriques . she is a second year PhD student from the University of Mouloud Mammeri, Tizi Ouzou, Algeria

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Posters

VALORIZATION OF DREDGING SEDIMENT OF SAFI PORT IN CIVIL ENGINEERING WORK (SAFI, MOROCCO).

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Abstract

In Morocco, the accumulation of sediment at the bottom of the ports is a natural phenomenon that reduces the capacity of the vessels. To facilitate the access of boats to ports, it is essential to carry out regular maintenance dredging. On average, 3 million m^3 of sediment are dredged annually in Moroccan ports and discharged into the marine environment. Moreover, the demographic and economic development of Morocco resulted in increased resource requirements and their scarcity, including building materials resources.In this context, our research focus first on identifying the characteristics of the dredged sediment from the port of Safi. Then, on the development of a scientific methodology to valorize this sediment and implement an alternative and sustainable material acceptable in eventual civil engineering work.

Keywords: Marine sediments, valorization, civil engineering work, durable material.

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Biography

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QSPR Study of the Retention/Release Property of Odorant Molecules in Water, Dairy and Pectin gels

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Abstract

As continuation of our research work on the development and prediction of retention/release property of odorant molecules in Water and pectin gels, in this research, on the one hand, we investigate to establish the quantitative structure property relationship (QSPR) of the retention/release property of odorant molecules in dairy gels. ACD/ChemSketch, MarvinSketch, and ChemOffice programs were used to calculate several molecular descriptors of 51 odorant molecules (15 alcohols, 11 aldehydes, 9 ketones and 16 esters). The best descriptors were selected to establish the QSPR models of the retention/release property of odorant molecules property in dairy gels using principal components analysis (PCA), multiple linear regression (MLR),We propose quantitative models according to these analyses. The multiple linear regression (MLR) method showed a correlation coefficient of 0.901 and 0.917 for DG (dairy gel without pectin) and DG-P (dairy gel with pectin) medias, respectively. Internal and external validations were used to determine the statistical quality of QSPR of the two MLR models. On the other hand, we compared these results with the other of our previous works to detect the pectin impacts of the retention/release property of studied compounds in different medias (with and without pectin). The comparison indicates that the effects of pectin vary according molecules: adding pectin increases the retention of some molecules, but increases the release of other molecules.

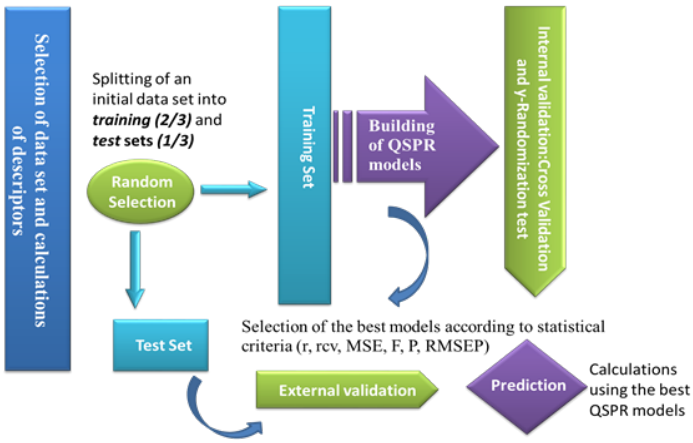

Fig. 1: Flow chart of the methodology used in this work.

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Biography

Assia Belhassan has her expertise in the quantitative structure activity-property relationship study in improving biological activity of chimical componds. She is PhD in Chemistry from the University Moulay Ismail, Faculty of Sciences, Meknes, Morocco . She published two papers in two international journals.

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Simultaneous water and energy saving in cooling water networks using pinch approach

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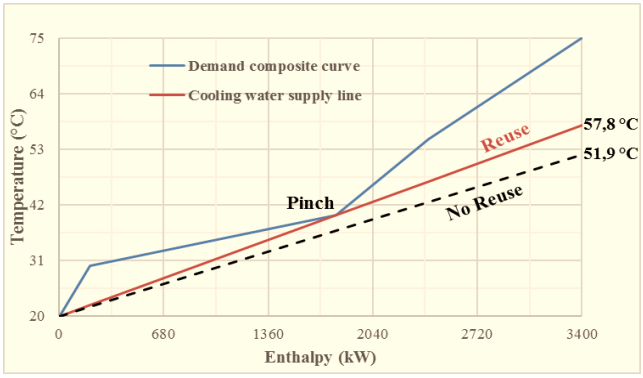
Abstract

Recirculating cooling water (CW) networks is the most common method used for rejection of waste heat to environment. Water distributed via the heat exchanger networks in parallel configuration to provide cooling duties for hot process stream. In this paper, process integration approach based on pinch analysis technique used to address energy efficiency issues in the CW system for retrofit design problem. The demand composite analysis (DCA) is an analytical approach requiring no graphical procedures developed in this work to target simultaneously, prior to the detailed network design, the minimum fresh CW heat capacity flow rate and maximum waste CW temperature to maximize the efficiency of cooling tower. The key basis for DCA is the conversion of the cooling duties to equivalent demand and source pairs. The demand composite curve is a graphical representation generated from DCA to understand the targeting philosophy. Two case studies treated to illustrate the practicability of this approach.



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Biography

The author has experience in the rationalization of water and energy. His focus is based on the use of Pinch technology to minimize the use of water and energy in industrial processes. The author is currently PhD student in engineering sciences and techniques from the Department of Processes Engineering, Mohammed V University, Mohammadia School of Engineers, Morocco.he has two papers being published.

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Application of heterogeneous Fenton oxidation for degradation of methylene blue dye

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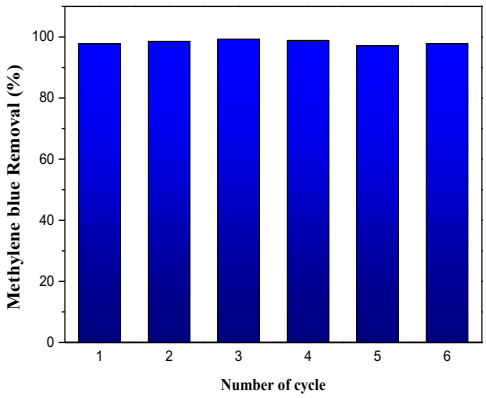
Abstract

The pollution of water by dyes from the industries has been one of the most environmental important problem. A wide range of treatment technologies, including adsorption, coagulation and biological treatments are used to remove a dyes from waste water. However, all of these methods has shown significantly disadvantageous. Advanced oxidation processes (AOP) are the most promising method used in the field of wastewater treatment to reduce toxicity, and to convert recalcitrant contaminants into biodegradable by-products, or to reach the complete mineralization. In this work we study one of the technologies that belongs to the Advanced Oxidation Processes (AOPs); the heterogeneous Fenton process. A functionalized activated carbon based on Pedicels of dates, agricultural residues available in south of Algeria,was prepared by impregnation of an iron precursor, followed by a heat treatment at 300°C as an heterogeneous Fenton catalysts for degradation of methylene blue dye. Under the influence of serval parameters (pH, concentration of H_2O_2 and masse of catalyst), the degradation of methylene blue was followed by UV-Visible spectrophotomer. Obtained results showed good process efficiency 97% of methylene blue removal working at acid pH and 2.5 mMof H_2O_2in 3 hours. More importantly, catalyst exhibited an excellent stability, it was recycled 6 runs still maintaining the same efficiency.



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Biography

Salima LAIB is PhD student in 3rd year (LMD) option engineering industrial processes to University of Science and Technology HouariBoumediene, Algeria. Her objective is based on the preparation of a functionalized activated carbon for the heterogeneous Fenton process for the degradation of organic matter in aqueous phase.

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Adventitious flora associated with Saffron (*Crocus sativus* L.) in Morocco

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Abstract

A floristic and ecological study was carried out in the most zones producing saffron in Morocco: Taliouin, Taznakht, Ourika, Imilchil, Tinghir, Midelt, Sefrou, Titouan and Oujda. From 49 surveys carried out in the various zones, the 210 weeds listed belong to 34 botanical families, 85,8% of which are dicotyledonous. Five families *Asteraceae*, *Poaceae*, *Fabaceae*, *Brassicaceae* and *Caryophyllaceae* together account for 64% of the total population. Biological analysis shows a predominance of annuals with 147 species, representing 70,3% of the total population. Mediterranean taxa predominate with 62,3% of the total population. Consideration of the harmfulness aspect of weeds allowed identifying 12 problematic species as *Hordeummurinum* (L.) Pers., *Malvaparviflora* L., *Silenerubella* L., etc.

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Biography

RIMANI Maria,Ouarzazate, Master degree in Horticultural and Landscape Engineering in 2017 - Faculty of Sciences of Oujda, PhD student, Laboratory of the Plants Biology and the Microorganisms, Faculty of Sciences, University Mohammed first, Oujda, Morocco.

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Modeling of rainfall parameters - flow in the watershed of Oued Ansegmir (Haute Moulouya, Morocco) (MODEL IHACRES)

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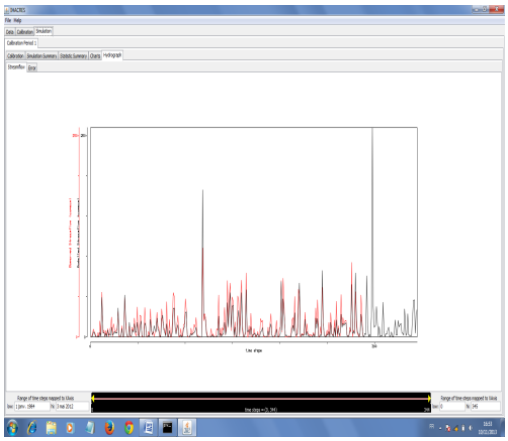
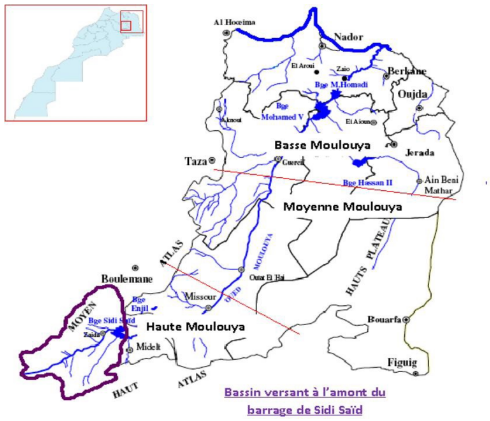
FSM, UMI, Meknes

Abstract

Flow in arid and semi-arid regions tends to be dominated by rapid responses to intense rainfall events.
The IHACRES model is an effective rain-flow model that has been applied to a large number of watersheds covering a wide range of climates. While originally designed for more temperate climates, the model has been successfully applied to a number of ephemeral streams in Australia.
The IHACRES model gives estimates by response curve directly from observed flow data and also gives statistics.



Flow simulation for the period 1984 -2012



Bassin versant à l'amont du barrage de Sidi Saïd

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Comparative Evaluation of Removal of Red Burgundy Acid by Membrane Polymer Inclusion (PIMs) with Aliquat336 and TOA

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Abstract

Dyes are widely used in various industries, such as textiles, paper, plastics, cosmetics and leather, for coloring their final products. It is the first contaminant to be recognized in wastewater. Membrane separation is relatively a new type of separation process which is predicted ultimately to replace a majority of conventional separation systems.

Recently, a novel type of liquid membrane system, called a polymer inclusion membrane (PIM) has been developed; Polymer inclusion membranes (PIMs) retain most of the advantage of SLM while exhibiting excellent stability and versatility. The lower diffusion coefficient often encountered in PIMs can be easily offset by creating a much thinner membrane in comparison to its traditional SLM. PIMs consist of a high molecular weight polymer to provide mechanical strength, a plasticizer to provide elasticity, and a carrier molecule to facilitate selective transport of the analytes. Poly(vinyl chloride) (PVC) and cellulose triacetate (CTA) are the most commonly used polymers for preparation of PIMs, since they are able to embed carrier molecules and inhibit their leaching. In this study, molecularly imprinted polymers (MIPs) were prepared by two types of carrier nonionic: trioctyl mine (TOA), and basic: tricaprylmethylammonium chloride (Aliquat 336). The manufactured membranes have been characterized by Scanning Electron Microscopy (SEM) (morphology), and X-ray diffraction (XRD) and Fourier Transform Infrared Spectroscopy (FTIR) (chemical structure). Extraction efficiency was studied under various experimental conditions, such as pH (2- 9) of the aqueous solution, the concentration of extractant in the membrane (5 - 30µmol/cm^2), initial dye concentration (50- 250ppm) and the stirring speed (250- 400rpm). Under the optimized experimental conditions 93–99% of dyes were extracted.

***Keywords*:** Polymer Inclusion Membrane (PIM); Aliquat336; TOA, Extraction; acid dye (RBA).

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Biography

My research is focused on the application of polymeric membranes in the extraction and transport of organic and meniral molecules. I obtained my doctorate in 2016 at the University of Bejaia Algeria, I have 5 publications..

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Impedancemetric Study of Inhibiting Effect of Natural product on Hard Growth Water

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Abstract

Hard water form compact and adherent deposits to the walls of pipes and industrial or domestic installations [1] causing enormous technical and economic problems, in the factory constructions, agronomic and the domestic equipment (valves, taps and boilers). Therefore, it is very important to establish a treatment of Algerian hard ground waters in order to reduce their hardness and exploit them. Bounouara drilling is one of the important water resources that feeds the south east of city of Constantine with drinking water and even water for industrial and agronomic settlements. But the great inconvenience of Bounourara water is very high hardness which is in the order of 60°F.

Several works have been done to inhibit the hardness but all the inhibitors that were used are chemicals that have an adverse effect on health, that's why all the chemical inhibitors are used only for industrial water treatment.

In this work, we used citrus bark as a natural and ecological inhibitors to reduce the scaling power of Bounourara water and to prepare drinking water on the one hand, and valorize waste of two citrus bark on the other hand. The evaluation of chemical treatment effect of hard water of Bounouara was carried out by impedances measurement of the deposits of calcium carbonate electrolyte interface [2, 3].

Key words: Scaling, calcium carbonate, inhibition, natural inhibitor, electrochemical process.

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Sorption of yellow Bezacryl from Aqueous Solutions Using shoe soles waste Materials: Adsorption and Characterisation Studies

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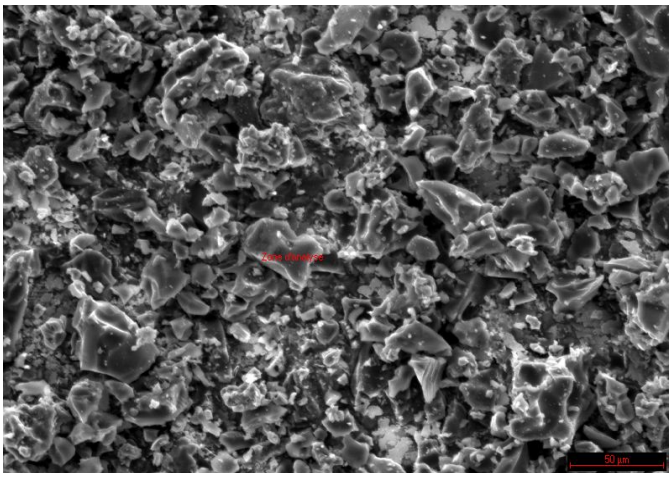
Abstract

Inexpensive and easily available shoe soles waste was investigated for the removal availability of yellow Bezacryl from aqueous solution.

Batch experiments were conducted to study the effects of the main parameters such as contact time, initial concentration of yellow Bezacryl, sorbent concentration and solution pH on the adsorption of yellow Bezacryl by shoe soles waste. The maximal adsorption capacity was 108 mg/g at pH 6.0, initial yellow Bezacryl concentration of 50 mg/L, sorbent concentration of 0.1 g/250 mL, agitation speed of 400 rpm and temperature of 20 °C. Dynamics of the adsorption process were studied, and the values of rate constants of pseudo first-order and pseudo second-order were calculated by maximization the coefficient of determination between experimental data and kinetics models using the solver add-in with Microsoft Excel. The adsorption kinetics of the yellow Bezacryl followed pseudo-second-order model. Equilibrium isotherms for the adsorption of shoe soles waste were analyzed by the Langmuir, Freundlich, Redlich-Peterson, Generalized model and Sips isotherm models. The Langmuir isotherm model was found to represent better the data.

The results of the present study show that shoe soles waste is an effective adsorbent for the elimination of lead from aqueous solutions.

Keywords: shoe soles waste, yellow Bezacryl, adsorption, modeling, non linear method.



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Biography

Author has her expertise in preparation of adsorbents from solid wastes and adsorption phenomenon. He was warded her PhD in 2012 from the University of Bejaia (Algeria). She published more than 5 papers. Her H-index is 3 on Scopus.

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Effects of nano silica on the properties of low clinker cement mortars

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Abstract

This paper explores the effects of nano-SiO2 on the mechanical properties and microstructure of cement mortars containing high volume of slag. The main objective of this research is to constitute a low-clinker cement mortar with high mechanical properties. The cement containing 70% of slag was partially substituted with Nano-SiO2 in ratios of 0%, 1%, 2%, 3% and 4% by weight. In order to study the mechanical and physical characteristics of the hardened cement pastes incorporating Nano-SiO2, different techniques were used such as compressive and flexural strength testing, setting time, X-ray difrraction annlysis (XRD) and scanning electron microscope (SEM). The results showed that the early age and long-term mechanical strengths of the slag cements mortars were significantly improved by the addition of nano-SiO2. The slag cement containing 3mass% of nano-SiO2 possessed the highest improvement of mechanical properties and microstructure of hardened cement pastes and mortars. It was suggested that the higher pozzolanic affinity of nano-SiO2 particles and the nucleation of C–S–H caused the enhanced strength development. an overview of the main biomaterials used for bone reconstruction.

Biography

Author has her expertise in evaluation and passion in improving hydration kinetics and mechanical properties of cement containing high volume Of slag. Her focus is based on the use of nanomaterials in green cements and concretes.

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Effect of incorporating plastic waste as aggregateon the physical and mechanical performance of concrete

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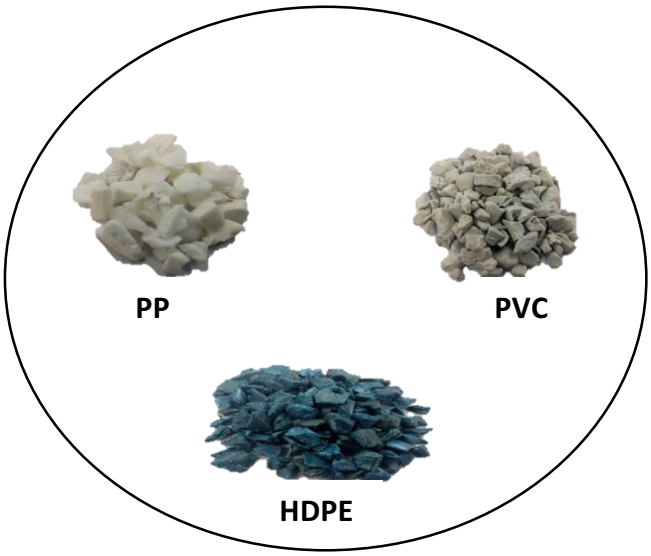
Abstract

Construction professionals, increasingly confronted with issues related to the preservation of the environment, have been facing difficulties in the supply of raw materials in recent years. On the other hand, the building sector produces a very large quantity of waste, which is still too often deposited in a storage facility. The recovery of this waste becomes a major environmental issue. The valorization of this waste becomes a major environmental challenge. Their re-use as aggregates intended for the manufacturing of new concretes would allow the safeguarding of the natural resources, but also a limitation of pollution by hiding.This work focuses on the recovery of a waste that is harmful to the environment because of its cumbersome and unsightly nature which is plastic waste. Three types of plastic waste are added in the concrete as aggregates (sand 0/3 and coarseaggregate 3/8).

This work consists of recovering plastic waste, specifically PP, HDPE and PVC released into the environment, and incorporating them in volume substitution of ordinary aggregates, at rates of 25, 50 and 75%. The results of this experimental study show a difference between the evolution of the physical and mechanical performances of the concretes containing plastic waste compared to the ordinary aggregate concrete.



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5. A. Aattache, A. Mahi, R. Soltani, M. Mouli, A.S. Benosman. Materials & Design2013 ;52:459-469.

Biography

Mr Belmokaddem Mohammed

Master's degree, specialization: Design of Steel and Concrete Structures in University USTO.MB of Oran.

Currently PhD student in Civil Engineering at the University USTO.MB of Oran.

FIELD OF INTEREST: Cementitious materials, innovative concretes, waste recycling in the field of Civil Engineering.

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Study of water pollution and its impact on the environment: example of the hydrosystem Lake of Birds-Algeria

Toumi[1], Berredjem[1], Alayat[1], Houhamdi[2]

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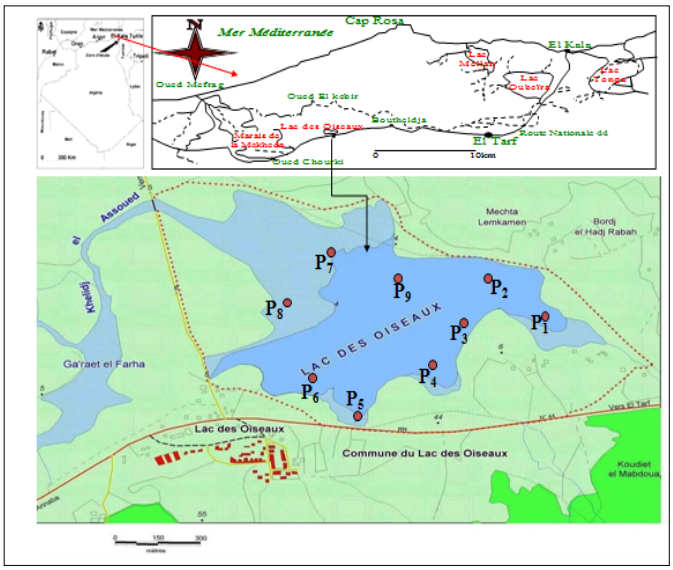
Abstract

The “Lac des Oiseaux” (36 ° 47'N 08 ° 7'E), is located in the extreme NE of Algeria (Figure 1, is named for its rich birdlife, especially in winter. is classified Ramsar site since 02 February 1999, is part of a complex wetland in eastern Algeria which a large part was built to be a national park. The protection of the natural environment is assumed to protect the water quality of the watershed against any urban or industrial pollution. The need is urgent for an integrated and appropriate approach of watershed and water management in order to conserving the corresponding wetlands [1]. The quality of water in the world has experienced in recent years deterioration because of uncontrolled industrial discharges and the intensive use of chemical fertilizers in agriculture. Agricultural activity and the growing need for water resources have increased around the lake, threatening the ecological integrity of this site [7]. These actions directly affect the quality of the water. During episodes of overflow, wastewater is directly discharged into the wadis and in natural sites thus promoting their overloads biodegradable organic matter to microbial growth, which undoubtedly affects the physico-chemical water quality of the lake. It is in this perspective that this work aimed to evaluate the spatial and temporal variations in levels of certain chemical elements as well as toxic nutrients present in the surface waters of the Birds Lake of the aquatic ecosystem during the wet season.



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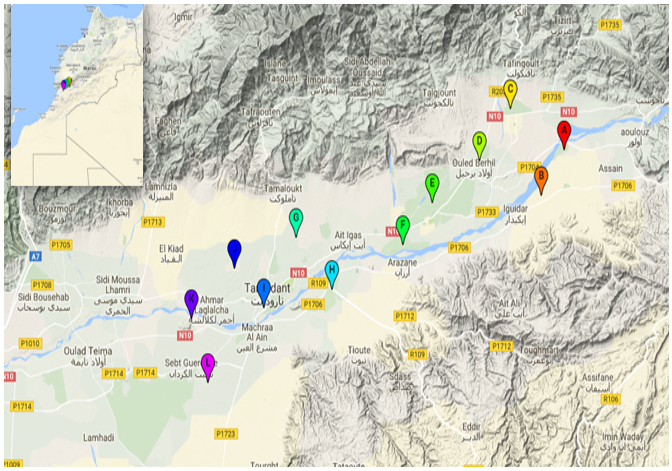
Calibration of GFS model by using real time weather data for water requirement forecasting of citrus crop at the Moroccan Souss basin

Athman Hafidi[1], Rachid Salghi[1], Ataa Abouatallah[2] , Mohamed Ayoub[1] , Fatima Ayoub[1] , Naziha AFFI[2]

Abstract

The work is about validation of Global Forecast System (GFS) model for citrus water requirement prediction in the semi-arid Moroccan region called Souss-basin. The technique consists on using real time weather data installed to calculate Evapotranspiration (ETo) and statistically compare it to forecast values. GFS model prediction was enough accurate for ETo estimated on daily basis through air temperature, relative humidity and solar radiation forecasting (89,3% for Souss Upstream and 76,1% for Souss Center). However, no logic relation could be found prediction compared to measurements of Rain and Wind. The annual predicted irrigation water needs (ETc) was 7626,5 m3/ha, when the measured one was likely 7669,1 m3/ha in Souss Upstream; and when it comes to Souss Center more closer to sea, this value is predicted to be only 5716,3 m3/ha with a good correlation to calculated measurements showing 5948,7 m3/ha Nevertheless, Calibrations must consider seasons of the year; the tested model was more accurate during cold period from 01/10/16 to 31/03/17, but in the hot period, predicted temperature and ETo become overestimated.



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Biography

Athman HAFIDI Agricultural engineer and PhD student at the National School of Applied Sciences Ibn Zohr University has specialized in recent years in the sustainability and rational management of natural resources related to agricultural production such as the management of irrigation.

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Physicochemical characterization of natural clay. Application to the removal of malachite green dye

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Abstract

Environmental pollution is one of the worldwide problems that are of great concern as the natural ecosystem is deteriorated. Several industries use dyes to accomplish different kinds of operation. The nature and amount of dyes vary from industry to industry, and from operation to operation. It is believed that the dyeing industry is responsible for releasing 100 tons of dyes per year into the environment, contaminating rivers and springs [1, 2]. Natural clay and its derivatives have recently received great interest due to their potential applications in diverse areas of research. They have been widely employed in adsorption [3], ceramic [4], cosmetic, pharmaceutical [5] and catalysis [6, 7] because they are low-cost, non-corrosive, and versatile tuning. Several clay-based materials have been used in photo-catalysis, including mainly pillared clays, modified organo-clays and acid-modified clays [8, 9].Volcanic clay from Aïn Ouarka south west of Algeria (CA) was applied to remove malachite green (MG). This material was purified (CA-Na^+) and characterized by different techniques such as Brunauer, Emmett and Teller (BET), scanning electron microscopy (SEM), X-ray diffraction (XRD), thermal analytical techniques (TGA-TDA) and Fourier Transform Infrared Spectroscopy (FTIR). The cation exchange capacity (CEC) was also determined. Batch adsorption tests were performed to examinate the effect of several parameters such as contact time, pH of solutions, initial concentration and temperature. The results show that the clay contains two phases, Sericite 2M1 and Clinochlore, with good crystalline and have a very compact and layered structure. The adsorption of MG dye reached its maximum at pH close to 6. Kinetic and isothermal experiments were studied to establish the equilibrium time and adsorption capacity of the two clays. We used the two kinetic models pseudo-first orders and pseudo-second order. Two isothermal equations: Freundlich and Langmuir, have been applied for the modeling of adsorption isotherms by the linear method. A significant effect of temperature shows that the adsorption phenomenon is an endothermic process.

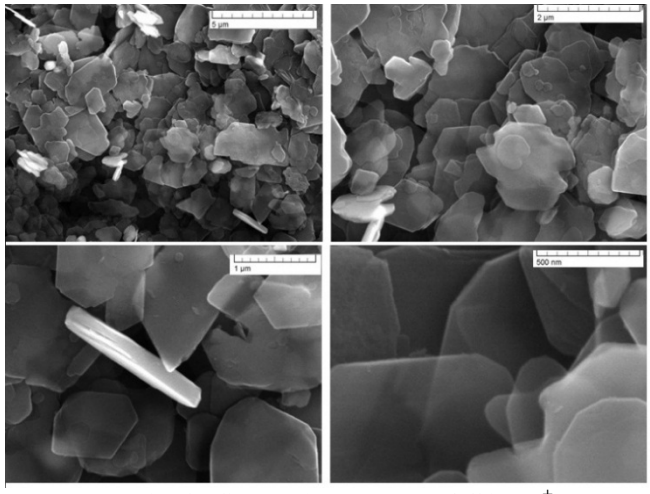

Fig. 1 : SEM micrographs of CA-Na^+

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Effect of the HA/Mg/β-CD matrix on the antibacterial activity of the ciprofloxacin loaded in its surface

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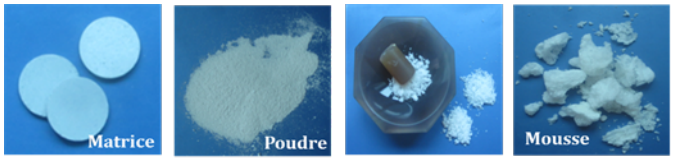
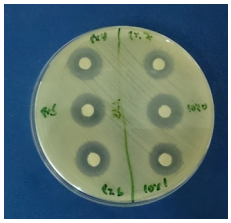
Abstract

In order to prolong the drug release from Mg doped hydroxyapatite matrix prepared by the sol gel method, we have activated their surface by cold plasma in order to increase the number of reaction sites without altering their characteristics, and then we have functionalized them by a simple β-cyclodextrin (β-CD) attachment to obtain controlled-release system.

The evolution of the release kinetics of the CFX encapsulated in the hydrophobic cavity of β-CD as well as the evaluation tests of its antimicrobial activity vs both pathogenic microorganisms: Escherichia and Staphylococcus aureus were followed and studied. The analysis of the results shows the beneficial contribution of the presence of β-CD and magnesium into the hydroxyapatite matrix on the drug release kinetics and its antibacterial activity.

Keywords: hydroxyapatite, sol gel, β-cyclodextrin, ciproflo-xacin, controlled-release system.





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Biography

The reseaches of Dr S. ZIANI are focused in hydroxyapatite as bone material. she works to improve hydroxyaptite destined to bone repare. She was warded her PhD in 2016 from the University of BEJAIA, ALGERIE. She published 9 papers. Her H-index is 6..

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THE IMPACT OF MICROPLASTICS POLLUTION AND THE STRATEGIES OF BIOREMEDIATION IN THE MEDITERRANEAN SEA

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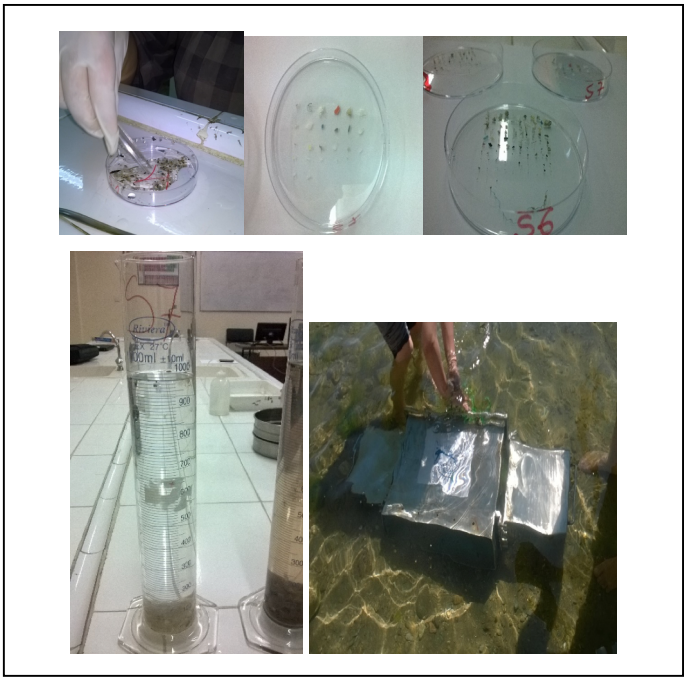
Abstract

Plastics production has increased dramatically in the world over the last 60 years, from 0.5 million tons per year in 1960 to nearly 300 million tons currently. Due to a deficit in the collection and treatment of waste, and because of the high stability of plastics, they invade the seas and oceans and persist for a long time. The latest estimates estimate the number of plastic particles floating on the surface of seas and oceans at 5,250 billion, corresponding to 268,940 tons of waste in 2014.

Once released at sea, macroplastics will undergo mechanical degradation due to marine currents but also a photochemical degradation due to the action of the sun. The macroplastics are then progressively reduced to microplastics of small size (less than a few millimeters).

In recent years, researchers have investigated the ecological impacts of microplastics. Because microbeads can absorb and concentrate toxic hydrophobic substances in local water and they are subject to longrange transport, they can serve as efficient pollutant delivery systems. After their release into the marine environment, microplastics accumulate a diverse range of toxic and persistent organic contaminants, including pesticides, flame retardants, and even PCBs. Strategies to solve the problem of microplastics pollution should focus on source control and remediation and clean up.

The objectif of this reaserch work should assess whether microbial genes involved in plastics degradation are there in the Algerian Sea and have begun to spread in the environment. This study also concerns the development of a protocol needed to develop strategies for in situ biodegradation of microplastics to study the bacterial flora naturally associated with these microplastics and to evaluate their ability to interact and degrade these microplastics. The identification of bacteria capable of degrading the microplastics and molecular bases of this degradation paves the way for the use of these microorganisms for the bioremediation of microplastics in the Mediterranean.



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Biography

I gained knowledge in the field of measurement and prevention of marine pollution during my engineering studies and continuing education within the School of Marine Sciences. My goal is to find a how to remedy this invisible pollution that is microplastic and being able to reduce it in the near future "in cha ALLAH". I am currently a PhD student at the school of Marine Sciences and Coastal Development in Algeria

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Study of lipids extracted from the soil of the public discharge of Tangier (Morocco)

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Abstract

The pollution of soil is the result of the abnormal accumulation of toxic elements or pathogens related to human activity. The production of waste is among the sources of this pollution, these wastes have harmful impacts on human health and the environment. The objective of this work is the global characterization and depth of the soil organic matter of the public discharge uncontrolled of the city of Tangier. The study of the organic fraction shows that different lipid fractions are essentially composed of linear hydrocarbons (of animal and / or plant origin), isoprenoids, hopanes and polycyclic alcohols These lipids were extracted and fractionated on columns of silica and analyzed by chromatographic techniques (GC/MS).

Key words: waste, organic matter, lipidic fraction, CG/SM, hydrocarbons, isoprenoids and hopanes.

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Biography

My research activities were started in 2007, within the laboratory physical-chemistry of materials, natural substances and Environment (LAMSE), where I studied the characterization of organic matter in soils and sediments, particularly the evolution of the degree of transformation of this matter in the phosphogypsum and the foam. In parallel to this theme, I have been able to do studies on soils and of leachate, characterizing the organic matter by different analytical techniques. The same in the framework of the Environment, I have participated in the work of research that relates to water and its pollution by heavy metals. I obtained my Ph.D. thesis in 2013 from the Faculty of Sciences and Technology, AbdelmaleEssaâdi University, Tangier, Morocco. Actually, I taught chemistry at the Faculty polydisciplinaryofLarache, and I have published more than 17 of scientific research work (national and international).

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Moroccan beaches protection against coastal erosion by geotextile tubes

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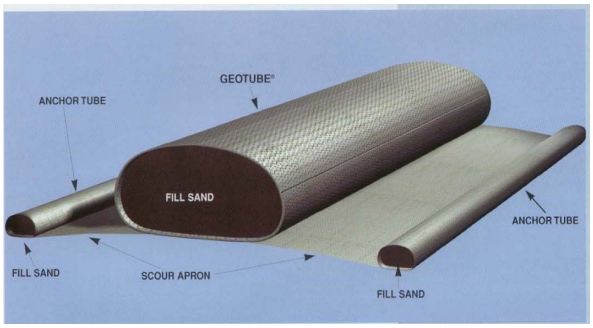
Abstract

There are different types of beach protection works against coastal erosion. The most traditional are breakwaters build by natural rock fill and others 'relatively' moderns called "geotubes", envelopes in the form of tubes made from geotextile and filled with local materials like sand or dredging sediments. This type of structure will value local or dredged material and will improve wave attenuation systems. These protection systems have several advantages comparatively to conventional solutions, such as: i- Good landscape integration; ii- Valorization of local materials (sand, dredging material); iii- Low amount of rock fill required; iv- Easily reversible and speed of implementation; v- And relatively low cost.

Because of the advantages mentioned above, these systems are environmentally friendly. And at the same time, as well as the valorization of local materials, they utilization will preserve natural rocks, which will become in the future rare source because of the strong national demand for building and civil engineering projects.

Geotextile tubes consist of water permeable, sand-sealed geotextile filled with sand or other granular materials. The tube diameter can vary from 0.5m to 5.0m and the length may vary from 25m to 100m depending on the project where the geotextile tube will be installed.

They functioning as beach groynes, breakwater, dune toe protection, submerged reefs, containment dykes or core structures.



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Biography

Author is civil engineer, works in the maritime field. Currently, he is working on a thesis in the field of beach protection by geotextile systems at the Mohammedia School of Engineers.

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Influence of moisture on the axial resistance of clonal eucalyptus wood

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Abstract

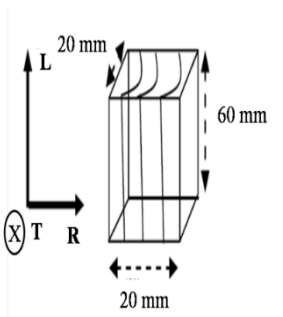
The knowledge of the mechanical properties of clonal eucalyptus wood is a prerequisite for any attempt to develop and valorization this type of wood. It will allow the identification of the conditions of its use, and will thus constitute a basis for a technical and economic argument for its development in the local market.

In this work, we determine, at ambient temperature, the resistance and modulus of elasticity in axial compression at different wood moisture levels of two eucalyptus clones (3758 and 579) originated from Gharb Maâmora plantations. For this purpose, characterization tests were carried out on standardized specimens taken from each wood, with 20 test pieces for each test.

The results obtained show that the modulus of elasticity and the axial resistance for these two clones increase when the moisture of the wood decreases. In addition, according their stress of rupture, wood of both clones is ranged in the field of weak constraints. These results show that clone 3758 (the base of *eucalyptus grandis*) has a high modulus of elasticity in compression and low axial resistance compared to clone 579 (the base of e*ucalyptus camaldulensis*).

This difference between some specific mechanical properties of the woods from the two clones can be attributed to the presence of tension wood, juvenile wood with the combination of silvicultural factors.

Keywords: Clonal eucalyptus, Wood, Axial resistance, Modulus of elasticity, Moisture.



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Biography

Mahyoub Sanhan Khalid AMER, I was born at 20/12/1973 in Taiz-Yemen, I work as a teacher of physics at the Higher Institute in Taiz. I had Master degree in Physics; Energy and Materials Ttechnology from the Faculty of Science Mohammed V University. Currently, I am PhD student in physics department, Laboratory of Condensed Matter and Interdisciplinary Sciences, Faculty of Science.

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Characterization and dynamic of pollutants flux discharged by Mazafran River (Bou-Ismail Bay, Algeria) on the nearshore coastal environment

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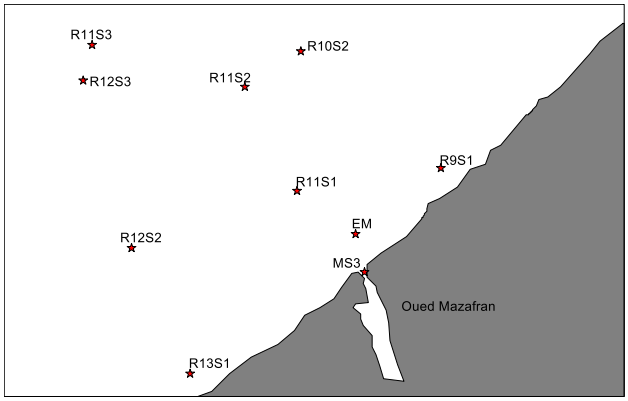
Abstract

A measurements campaign and samplingon Mazafran River and the nearshore coastal zone was conducted during the end of the summer season. The results of in situ parameters in Mazafran stream have shown seasonal temperature, a characteristic pH of surface water generally recorded, but a low level of dissolved oxygen, which may worm of anthropogenic contamination. Chemical oxygen demand (COD) and biochemical oxygen demand (BOD) was found at concentrations largely in excess of their recommended thresholds in surface water. Likewise, nitrogen and phosphorus nutrients show excessive enrichment. The coastal waters of Mazafran valley was characterized by seasonal temperatures (between 21.82 and 21.14 ° C), pH between 8.14 and 8.19.A good oxygenation of the surface water, despite the high concentrations of suspended matter recorded (up to 111 mg / l), which can be explained by phytoplankton development, given the relatively high concentrations of chlorophyll*a* encountered (between 0.4 and 0.8 µg/l).The nutrients display a wide-downward concentration gradient for the whole, with low nitrite and phosphate values and high levels of nitrates, which may be due to the river influx of the Mazafran River.



Sampling stations location

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Biography

Author is a Research Associate at the National Center for Fisheries and Aquaculture Research and Development (CNRDPA). My interest areas include marine pollution monitoring and biodegradation of persistent pollutants among ohters. I participate in different campaigns along Algerian coastal on board the research vessel Belkacem Grine since the year 2014 to study the hydrology of the Algerian basin and evaluating the degree of its pollution.

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Physicochemical and Microbiological Characterization of Olive Mill Wastewater in order to determine the acoustic properties of a natural material based on Olive Mill Wastewater

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[2] Energy Laboratory of Materials and Environment (LEME). High School of Technology; Av Prince Heritier _BP 227 _ SALE, MAROC

Abstract

Olive Mill Wastewater or vegetable water from olive oil extraction, are a major problem in the olive sector, because their rich on organic material and mineral with an acidic pH. In this perspective, our study focuses on the valorization of Olive Mill Wastewater with a plant biomass in order to develop an insulation used in the building. Our work is divided into two main axes: the first axis is dedicated to the physicochemical and microbiological characterization of the Olive Mill Wastewater; the second axis is the study of the acoustic properties of our elaborated material.

Key words: Olive Mill Wastewater, Valorization of Olive Mill Wastewater, Biomass plant, physicochemical and microbiological characterization, acoustic properties.

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Physicochemical characterization of softwood waste "Cedar" and hardwood waste "Mahogany": comparative study

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[2] Laboratory of Applied Chemistry, Faculty of Science and Technology, University of Sidi Mohammed Ben Abdellah , Road Imouzzer, BP 2202Atlas, FEZ, Morocco.

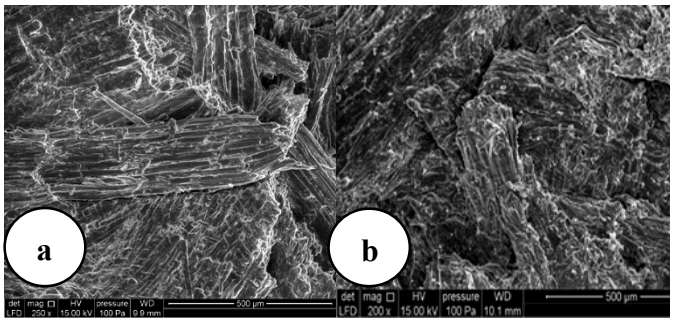
Abstract

The quantity of industrial wood waste does not cease to increase because of the production rates due to the evolution of the lifestyles of the human. These wood wastes often constitute a problem for the producers and the environment. Their management becomes a stake in the future at the international level and also for Morocco.

The wood waste from sawmill (sawdust) can find outlets for pulping industries (pulp, particle board, etc...). However, most of these wastes are traditionally used as fuel, posing a huge threat to the environmental balance. It is, therefore, essential to find new methods of valorization and reuse of these wastes.

The present work aims to characterize two types of softwood waste "Cedar" and hardwood waste "Mahogany" collected from a local industry in the region of Fez/Morocco. These sawdusts are physically pre-treated and then characterized by X-ray Fluorescence (XRF), X-Ray Diffraction (XRD), Infrared Spectroscopy (FTIR) and Scanning Electron Microscopy (SEM).

X-ray fluorescence analysis allowed the determination of organic and inorganic contents (CaO, MgO, SiO_2, Al_2O_3 ...) for each type of sawdust. X-ray diffraction revealed the presence of the crystalline phases of cellulose, with a higher crystallinity index for Cedar than in the case of Mahogany. The results obtained by infrared spectroscopy, are consistent with those obtained by DRX and FX. Scanning electron microscopy allows to analyze the morphology of these samples.This study clarified the similarities and differences in the chemical composition and morphological structure of these two sawdusts, paving the way for potential applications in the field of effluent treatment.



SEM micrographs (enlargement 250)
a: Cedar; b: Mahogany

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Biography

EL HAJAM Maryam student in my second year of thesis, I work on the valorization of industrial wood waste: contribution to the protection of the environment. My goal is based on the use of sawdust in environmental applications, such as the physical pre-treatment of industrial wood waste: mahogany and cedar.

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The effect of an ionic liquid on the corrosion inhibition of A9 ordinary steel in an aqueous medium. With & without the presence of cathodic polarization

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Abstract

This work focuses on the inhibition of ordinary steel in an aqueous medium by an ionic liquid in the absence and in the presence of cathodic polarization. Environmentally friendly, ionic liquids could be used temporarily to prevent corrosion of steel regular A9 with inhibition rate more than 50%. Electrochemical measurements: the evolution of the potential as a function of time, polarization curves and electrochemical impedance spectroscopy were used to study the influence of the inhibitor concentration on the corrosion processes of A9 steel. in an aqueous medium (mother water pH = 8.2) in the absence and in the presence of the cathodic polarization. Generally, the ratio obtains maximum around -1000 mV (SCE). However, the polarization potential more negative than -1000 mV could worsen the protective property due to some defect or loss of the deposit as the result of extensive bubble formation because of the predominance of hydrogen evolution on the surface.
Surface analysis carried out by scanning electron microscopy has shown that the presence of inhibitor improves in certain concentration the adhesion of the limestone deposit.

Key words: *Corrosion Inhibitor, Corrosion, CO2, impedance, polarization, carbon steel, X-ray diffraction, SEM, EDS.*

MORPHOLOGY AND MECHANICAL PROPRITES OF BLEND POLYMERS PC/SAN

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Abstract

Blends of styrene-acrylonitrile (SAN) with Polycarbonate (PC) with and without (SEBS-g-MAH) as compatibilizers were studied. One series of blends was prepared in composition 90/10, 80/20, 70/30, 50/50. The second and third series of blends was prepared with the addition of 5; 10 wt% of (SEBS-g-MAH). Their morphology and thermal behaviour were inspected by scanning electronic microscopy (SEM) and dynamic mechanic analysis (DMA), respectively.

The results of morphological observations revealed that the addition of a small percentage of compatibilizer decreases the domain size of the dispersed phase and the compatibility of the blends was enhanced. The shifts of values of glass temperatures (*Tg*) in the examined blends also indicate that with addition of compatibilizer miscibility between SAN and PC is improved.

Keywords - blends; polycarbonate; SAN copolymers**.**

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Morphometric relationship of mediterranean mussels *Mytilus galloprovincialis*, (Lamark, 1819) in Algerian West coasts

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Abstract

The mussel species, *Mytilis galloprovincialis* is very common in almost Algerian rocky coasts. It shows complex ecological and behavioral characteristics which vary according to the environment where it lives. In this investigation we are interested in analyzing the morphometric diversity of the mussels from four rocky sites in the west coasts of Algerian (Point de l'Aiguille, Oran Harbor, Mostaganem Harbor and Honaïne). We use the correlation values coefficient of the regression equations ($\mathbf{Lt= a\ Pt^b}$, $\mathbf{Lt= aH^b}$, $\mathbf{H= aE^b}$). The results showed that, according to the global scale, the three allometric relations highlighted in this work revealed that the increase of the length shell is less important than those of the height and the thickness. In another hand, the increase of the thickness is slower that the height one of all the specimens studied from all sites. The results reflect the adaptive response of the mussel following the physical and the ecological environment where it lives. The variation of the relations: length/height and length/thickness in the mussels from the four studied sites showed that this species has a tendency to growth in height and width faster than the length. This study revealed significant differences between the morphometric characteristics of mussel populations of the four sites**.**

Keywords: mussels, *Mytilis gallprovinicialis*, morphometric characteristics, Algerian west coasts.

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Biography

The author has experience in the field of hydrocarbon pollution and PhD researcher on the contamination of heavy metals in mussels in the marine environment sciences. He holds a Master's degree in 2011 from the University of Oran 1 Ahmed Ben Bella, Algeria, participated in several forums, organizing and Participating at the 3rd INTERNATIONAL BEL 03 CONFERENCE (Biodiversity and Coastal Ecosystems 26-28 November 2013).

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The search for a compromise between mechanical strength and fluidity of cementitious materials using plastic additives

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Abstract

The "concrete" material, which is a mixture of several components such as water, cement and aggregates, has remained since its existence at the beginning of the 19th century the most important element in the construction of civil engineering works, in fact good concrete is the one that satisfies these three qualities: mechanical strength, unalterability, impermeability and finally ease of mixing, transport and installation without segregation.

However, given the existence of certain aggressive media, we are faced with the need to find a combination of constituents to obtain a concrete that is fluid at the same time to ensure ease of pouring and optimize the flow time, both durable and therefore of a high mechanical resistance that can happen to resist the stresses associated with aggressive media.

In this research project, we propose in the first place a formulation of high-performance concretes by substituting a part of the cement for polypropylene fiber (0.5%, 0.75%, 1%, 1.5%) and a part of the sand for plastic grains (10%, 20%, 30%, 40%).According to the results found we can conclude that the substitution of sand for plastic grains leads to remarkable reductions in the density of all materials mixes, as well as improving the performance of sand concretes. In addition, the strengthening of the cementitious matrix with plastic fibers show a marked improvement in tensile strength.

Biography

State engineer of the Hassania School of Public Works and PhD student at Mohammadia high school of engineers, I'm actually doing my experimental researches within the Lafarge factory at the Meknes siteans during my research I participated in different journeys, Now I'm looking for an eventual publication.

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THE METEOROLOGICAL DROUGHT IN THE MIDDLE MOULOUYA IN THE CENTRO-ORIENTAL OF MOROCCO

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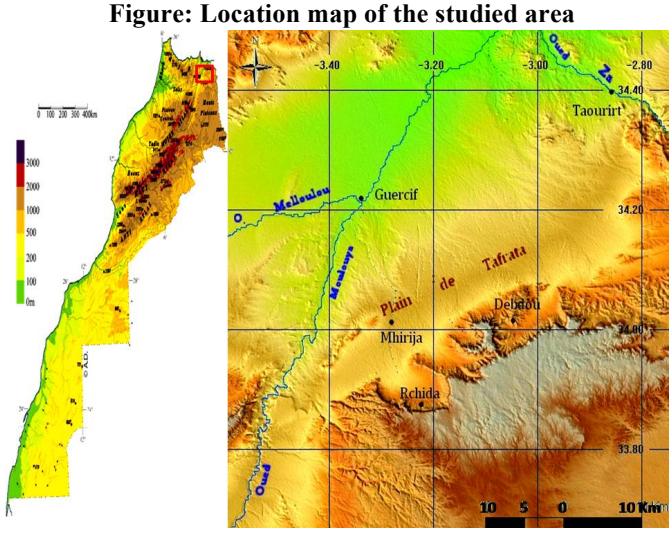
Abstract

The climate of the middle Moulouya region is very variable. The drought is one of the most worrying signs of this variability. However we note a modest pluviometric contribution, very unequally distributed in the space and very irregular in time.
Therefore, the aim of this study is to summarize some typical or extreme weather situations that occur in this area, and using some of the information that can be seen in the numerical models section, (mainly equal pressure maps) in a very general and easily comprehensible way. These are the most extreme situations that we distinguish in our region associating with different configurations that are observed in atmospheric surface maps (Anticyclones, depression, storms ...)
In the same feature, the atmospheric circulation characteristics study above the middle Moulouya region over a period of 34 years and during the extreme drought conditions until today shows the important role of position variations in the dynamics and intensity of anticyclones oceanic within the changes in the frequency and severity of extreme space and time weather phenomena and specifically in the meteorological drought.

Keywords: Meteorological drought, Anticyclone, Rainfall, moyenne Moulouya.

Figure: Location map of the studied area



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Integrated water resources management and wetland conservation: study of the surface water of the wetland Lac des Oiseaux (Algeria)

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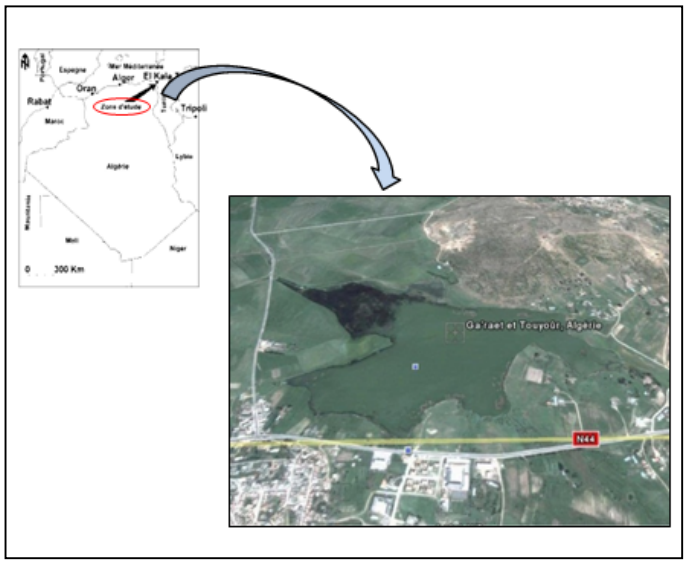
Abstract

The protection of the natural environment concerns the good quality of the waters against any urban or industrial pollution. The last few decades have witnessed the decline of wetlands around the world, which has led to numerous scientific or conservation programs that have led to specific national or international regulations. The Lac des Oiseaux (36° 47'N 08° 7'E) is classified as a Ramsar site since 1999, with an area of 70 ha is subject to severe natural and anthropogenic constraints. Many authors give the Lake of the Birds the status of rare because of its rich vegetation in avifaunes and the presence of numerous insects. Population explosion and economic growth have undoubtedly led to a greater demand for water that far exceeds available resources and there is no indication that the drought that has occurred over the last two decades will give rise to abundant rainfall. This calls into question the ecological integrity of the lake and its impact on the well-being of humans and the animal and plant species that depend on it. Our study focuses on the exposure of the lake to pollution related to anthropogenic activity. This choice is motivated by the importance of better understanding the spatial and temporal variability of the quality of this water body and its impact on the environment in order to understand its functioning, better manage its conservation and protect its biodiversity. Water sampling was conducted during a one-year study period to determine the physicochemical and bacteriological composition of water as a result of the identification of macro-invertebrates and micro-invertebrates aquatic bio-indicators of pollution. Our results show a notable difference in the levels and measured contents of each parameter studied. In the majority of cases it exceeds the standards required for surface waters indicated a source of pollution that affects the environment.



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Study of cupric ions behavior in Ethylenediaminesolutionwith a view to its recovery

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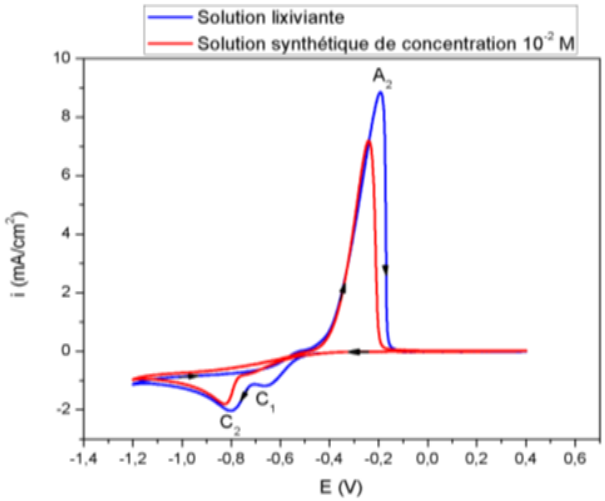
Abstract

We have studied the electrochemical behavior of copper in ethylendiamine complex solution for its recovery from waste printed circuit boards (WPCBs). We choose the ethylene-diamine as the latter has several advantages as a metal complex primarily related to its high selectivity towards copper and its non-toxicity.For this we have 2-step process.

At first we have studiedthe electrochemical behavior of cupric ion $[Cu(en)_2]^{2+}$in a synthetic solution by cyclic voltammetry. We also examined the influence of certain parameters (Sweep rate, rotating electrode rotational speed and concentration) on this behavior.

Secondly we reduced WPCBs to powder. This powder is then leached with the ethylenediamine solution. The electrochemical behavior of the leachate obtained is also studied by cyclic voltammetry. Finally we performed the electrolysis of the leachate to electroplate the copper while following the variation of cupric ions concentration of the solution as a function of the electrolysis time.



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Characterization and discoloration of methylene blue dye by modified clay with ZnO by impregnated method

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Abstract

Water is the most vital natural resource for life on our planet [1]. Water contamination is a major problem, and water quality is now a major environmental issue [2].Dyes are extensively used for many industries, including the textile, paper, plastic, wood and food industries [3]. Clay minerals are considered as promising supports due to their interesting inherent properties, namely their adsorption capacityand their ability to be bounded to chemical compounds [4]. Among the various available water treatment techniques Adsorption is known to be a promising technique, which has great importance due to the ease of operation and comparable low cost of application in the discoloration process [5].The purpose of this study is focus attention to the adsorption of methylene bleu (MB) onmodified clay with zinc oxide (ZnO) by impregnated method compared with calcined andraw clay. These samples are characterized by several analytical methods, XRD, DTG-TGA andBET. The results showsthese clayscontains three phases, Sericite2M1, Clinochlore and quartz with presence of a new phase for the modified clay named Zincite of ZnO.The measured cation exchange capacity (CEC) is 9meq/100g and the BET analysis shows a small area for these clays, between 9 and 30 $m^2 g^{-1}$. The Results showed also that the impregnated clay has a better affinity than others. Kinetics data of adsorption were well fitted by the pseudo-second-order kinetic model, as well as the adsorption capacity of impregnated clay (100 mg/g) was found to be around 4 times higher than natural and calcined clay (21.64 mg/g) (15.46 mg/g) respectively**,**and the isotherm data were well represented by the Langmuir and Freundlish model, when the thermodynamics studies indicated that adsorption of MB on these samples were endothermic.

Key words: Environment, Clay, Discoloration, Impregnated and ZnO.

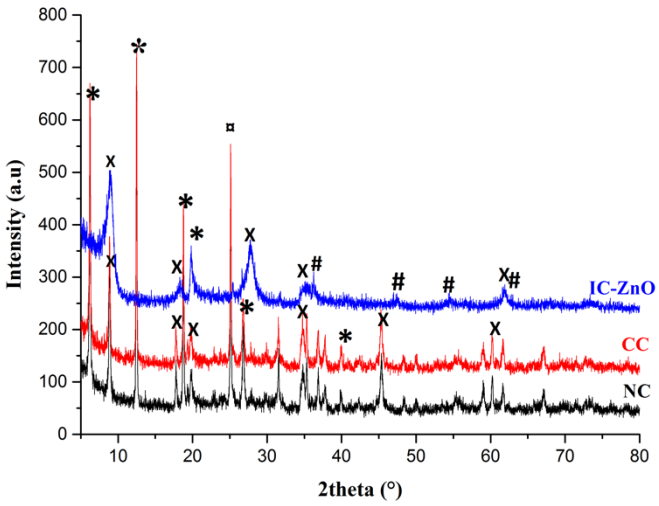

Fig.1: XDR diffractogram of NC, CC and IC-ZnO

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Extraction of essential oil from Artemisia herba alba and it application in the protection of Aluminum in HCl medium

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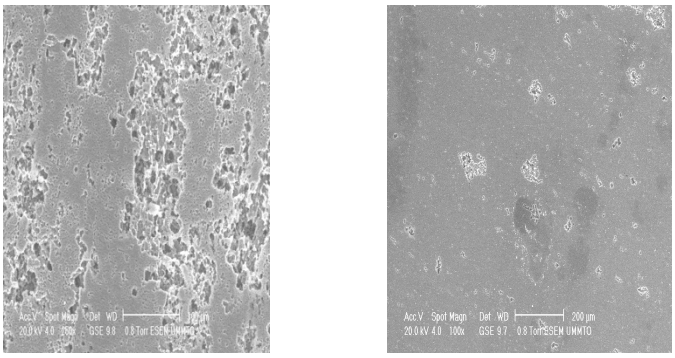
Abstract

Acids play a very important role in the industry especially in (scrubbing, industrial cleaning, acid scaling, etc.). However, the action of these agents alters metals and can sometimes, in addition to cost, lead to serious accidents. The use of corrosion inhibitors to combat this phenomenon is effective, however synthetic compounds are highly toxic and most of them are banned. As a result, the use of oils and plant extracts has aroused the interest of the scientific community as a good source of "green" inhibitors. It is within this framework that our present study is taking place. Indeed, starting from a green plant in this case the white artemisia, picked in the east of Algeria , the essential oil is extracted to study its effectiveness with respect to the corrosion of aluminium A1050 in HCl 1mol. L^{-1}. The extraction of the oil was carried out by hydrodistillation and steam training with an efficiency of (0.9 - 1.1%), the extract obtained was then characterized by gas chromatography coupled with mass spectroscopy. The study of the electrochemical behavior of aluminum Al 1050 in hydrochloric medium in the presence of this extract (temporal variation of the abandonment potential, potentiodynamic polarization, electrochemical impedance spectroscopy and gravimetric measurements allowed us to demonstrate an inhibitory efficacy of 91% and that the extract of this plant is a cathodic inhibitor.



Blanc 1g/l oil

SEM observation after 24h

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Biography

Author has her expertise in elaboration of alloys and protection against materials corrosion , he is a second Phd student from the university of Mouloud Mammeri Tizi-Ouzou, Algeria

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Valorization of lignocellulosic waste. Formation of carbonates from CO_2

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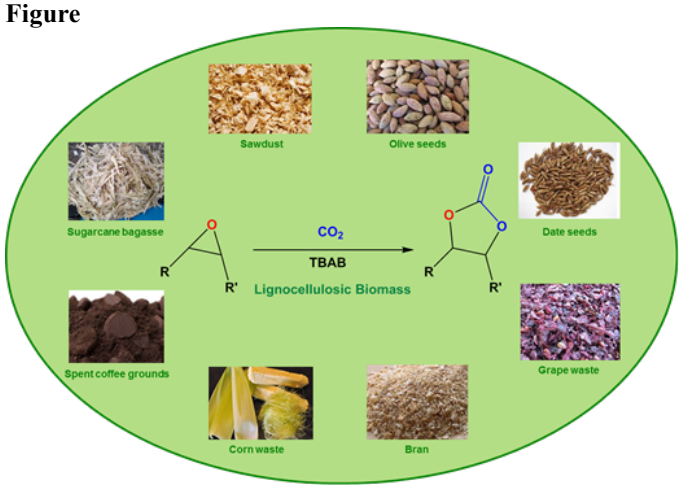
Abstract

Biomass and materials derived from biomass are generated from available atmospheric CO_2, water and sunlight through biological photosynthesis. As a result, biomass has been considered the only sustainable source of organic carbon in the earth and the perfect equivalent of oil to produce fuels and fine chemicals with zero net carbon emissions. In this context, lignocellulosic biomass, which is the most abundant and bio-renewable biomass on earth, is of crucial importance. Numerous studies have shown that lignocellulosic biomass has enormous potential for the sustainable production of chemicals and fuels. In addition, it is a renewable raw material in abundance and available worldwide.[1]

The use of CO_2 as a carbon source can be an expensive and renewable alternative given the impending depletion of fossil fuels worldwide.[2]

In this work, we will present the study of a new application of lignocellulosic biomass as a catalyst, in combination with tetrabutylammonium bromide (TBAB), for the formation of carbonates from CO_2 (see figure).[3] This study is one of the new trends in sustainable development in a global context of environmental protection, as it uses carbon dioxide considered as the main greenhouse gas.[4, 5]

Figure



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Biography

Ali Aghmiz received his degree in Chemistry from Université Abdelmalek Essaadi (Tétouan) in 1997. He completed his Ph.D. in the field of Organometallics and Homogeneous Catalysis at the Universitat Rovira i Virgili (Tarragona, Spain) in 2002. After many years of work as a researcher on different industrial projects at the Centre Tecnologic de la Química de Catalunya (CTQC), he joined the Department of Physical and Inorganic Chemistry in the Facultat de Química de Tarragona (Spain) as a Profesor Lector. Currently Ali Aghmiz holds a Professeur Assistant position at the Faculté des Sciences de Tétouan. His research interests are based on new catalysts development for carbon dioxide activation, especially for the transformation of CO_2 and epoxides in carbonates and polycarbonates.

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Use of chemical evaluation of effect of natural inhibitor in the treatment of hard water

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Abstract

Hard water contains many ions of calcium, magnesium and bicarbonates, which spontaneously form compact and adherent deposits in domestic and industrial installations (GHIZELLAOUI, 2006). The treatment of hard waters has been in the interest of several works in order to reduce the negative consequences of the tartar.

Our study concerns the softening of Bounouara hard water having a hardness of 60°F in the presence of lemon peel as a natural, food and ecological inhibitor. On the other hand, on the valorisation and disposal of lemon peels that are considered waste.

The evaluation and inhibition of hard water scaling of Bounouara and the monitoring of the growth germination phenomenon during the formation of the calcium carbonate deposit were carried out by the use of the rapid controlled precipitation method.

The plotting of the PCR curves obtained from the raw waters of Bounouara with respect to the waters treated with different concentrations of lemon peel shows that there is a delay in the formation of calcium carbonate scale by measuring pH and resistivity as a function of time from a concentration of 0.025 g/L and the total blockage of the precipitation is carried out at 0.25 g/L of addition.

Key words: Scaling, calcium carbonate, inhibition, natural inhibitor, RCP process.

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Feasibility of a database of physicochemical components of Moroccan inland wetlands: towards an abiotic wetland classification

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Abstract

Inland waters, as a heart of wetlands and of course of all life, occupy prior place in various investigation issues, both for research and management purposes.

Our main research consists in assembling available bibliographic data and assessing the opportunity to create a monitoring system of physicochemical characteristics of natural waters in Morocco. The results of this compilation were recorded in Excel tables, where references and data are inventoried in a standard format with necessary links between them.

To allow national spatiotemporal syntheses of physicochemical data, these should be identified by its *standard name* and at least through three attributes: (1) *value* (measure) expressed in similar or convertible *units*, (2) *exact date* (sometimes *exact time*), (3) *site* (water point) indicated with its exact coordinates. However, additional significant attributes are included in the database, mainly on sites' characteristics.

A first treatment of data extracted from 241 references permitted a preliminary assessment of their quality (in terms of significant syntheses). This communication, focused on sites' classification using their abiotic characteristics, revealed a minimum of 26 types of waters. This means sometimes the need of different methods of data collection, which complicates the database conception.

Oued Ahançal : Photo M. Dakki

Sidi Boughaba: Photo M. Dakki

Biography

Omkeltoum ZIDANI is a doctoral-student, working mainly on physicochemical components of wetlands at the national level, both at the Faculty of Science and Technology of Fez and The Scientific Institute of Rabat. She is undertaking an inventory of bibliography on abiotic factors in wetlands and filling a database on physicochemical data on Moroccan wetlands. She presented different papers on these topics, most of them being on press.

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Autopsy of the RO membrane of the khénifra brackish water desalination plant

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Abstract

This study was developed in a drinking water treatment plant located in khénifra, whose main source is oued oum Ribaa (420 l/ s). The quality of the raw water, was characterized by high concentrations of chlorides 600 mg / l, The shortage of good quality of the water, required desalination of brackish water to supply these regions with drinking water.

The desalination plant revealed difficulties related to the loss of membrane performance. In order to determine the reason for the clogging of the membrane, the fouling layer was analyzed. Membrane autopsy was performed by different methods, such as TOC (total organic carbon), SEM (scanning electron microscopy), FTIR (Fourier transform infrared spectroscopy), X-ray diffraction. The results show that the Fouling layer consists mainly of SiO2, clay, organic material (polysaccharide, protein), CaSiO3, Fe3O4, BrO2 and CaSO4.

Characteristic IR linkages indicate the presence of polysaccharides and proteins that constitute a source of additional microbiological growth; this is the problem of biological fouling. The metallic elements result from the corroded stainless steel and internal lining of the filter cartridges which are damaged by the silica particles released by the sand filters. The scale of the CaSO4 and CaSiO3 deposits is due to the poor anti-fouling efficiency. The results are presented and discussed in light of new trends in the material.

Image of settlers

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Biography

The authors are PhD students at the Faculty of Science of Rabat, for the ONEE agents, they also have doctoral students and heads of departments at the national office of water and electricity. They are realized several publication in the field of the water and the environment.

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Optimization of High Rate Algal Pond in floor mode for the purification of wastewater

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Abstract

The annual volume of urban domestic wastewater discharged into the natural environment (sea, wadis, land application, etc.), without prior treatment, was estimated in 2012 at 750 million m^3, thus constituting a source of pollution in the proportion 1/25.

The current rate of wastewater treatment is still low and reflects a lack of sewage treatment units. By the end of 2012, the level of wastewater treatment was about 37% compared to 8% in 2005, the number of WWTPs in service reached 81 (21 in 2005), with 29% of units equipped with a primary treatment performance , 45% of a secondary treatment performance and 26% with tertiary treatment performance. About 71% of the wastewater treatment systems are of the predominant lagoon type.

About 71% of the wastewater treatment systems are of the predominant lagoon type. Intensive systems are adopted in Morocco where the availability of spaceis restricted. Extensive systems are thus the main recourse for the purification of the waste water, especially at the level of small and medium-sized agglomerations. If the lagoon is currently the most widespread, other processes are expected to be developed and to takea place which they deserve from the various options selected. This is the case of the integrated system Anaerobic Reactor (AR) - High Rate Algal Pond (HRAP).

Studies have been completed and others are underway to adapt the integrated system AR - HRAP to the Moroccan context. This article enters within this framework. We are interested in the hydrodynamic, thermal and kinetic aspects of the operation of the system. The objective is to contribute to the judicious sizing of this system and to the optimization of its performances especially in floor mode.

Figure 1: HRAP Station of Wastewater Treatment (IAV Campus)

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5. Contribution to the optimization of the diffusion of oxygen in a High Performance Algal pond in floor mode (2017)N.HADDAOUI, S. BOUMAAZA and J. JELLAL.

Biography

I am a doctoral student at the Mohammadia school of engineering of Rabat, in 3rd yeardoctorate cycle within the water treatmentlaboratory-civil engineering department, I work on the treatment of wastewater by the process "integrated system Anaerobicreactor- high rate algal pond »

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Pesticides and nitrates: impacts of environmental and sanitary Situation of Triffa plain

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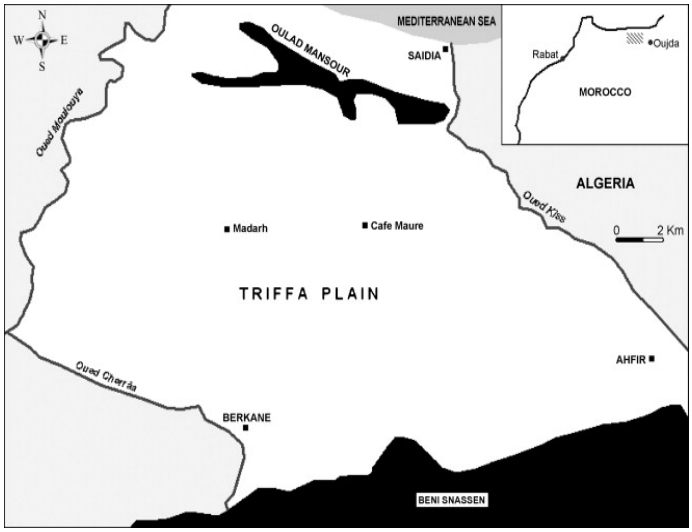
Abstract

Triffa, an area of 6100 Ha, is one of the most fertile and productive plain in the east of Morocco (Oriental). Despite the benefit of fertilizers and phytosanitary in the increase of agriculture productivity, there over use present a real danger on groundwater contamination and potential risk on human health. Yet, in Morocco, there is no enough studies and data on environment contamination by pesticides residues (groundwater, soil, food...).

Thus, the aim of this study is to identify and evaluate the contamination of groundwater, soil and food production, by pesticides and nitrates. Hence, samples of groundwater, soil and food, issued from a different part of Triffa plain have been analyzed.

The results show that Nitrate dose, in the most of groundwater samples, do not respect the international regulations and norms (50 mg/l); but less than 0.01ug/L for pesticides residues. Moreover, there is an over dose of Chlorpyriphos (Pesticides residues) in oranges.

Keywords : Pollution, Nitrates, Pesticides, environnement, health.



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Study of flood typology and flow regime in the Eastern Rif Catchment Basin

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Abstract

The Oriental Rif, especially the coastal watersheds, is among the Moroccan regions confronted with the phenomena of violent floods in several zones because of its semi-arid climate, its mountainous relief, its sparse vegetable cover and its ground which is little permeable. The hydrographic network in this territory drains moderate watersheds with areas of a few tens of km^3 to 3000km^2 maximum of about.The floods of rivers in these hydrological entities are generated by heavy rains.Their extreme floods, remain the most important natural responsible for the human losses and the material damage in the zone, as in the case of the famous catastrophe of October 2008 with its heavy toll of 30 deaths and considerable material damage that the area was exposed.For this purpose, for good hydrological risk management, the estimation of the characteristics of the high flows (duration, flow and volume) is necessary for the management of surface water and impoundments and for the design of the crossing structures.This remains difficult to achieve as the coastal watersheds of the Eastern Rif are ungauged or partially equipped with measurement stations controlling limited areas. Only regional methods can provide a solution to this problem.These adopted approaches are generally based on either the procedures allowing the transfer of available hydrological data from the unmeasured site-equipped surfaces or the conversion of rain-to-flow models.

In this context, the objective of this work is to propose a method for determining the characteristics of floods at any point in the hydrographic network of the study area. The results obtained constitute fundamental data allowing to characterize the hydrological and dynamic behavior of the Rif Oriental coastal watersheds.

Keywords: Rif Oriental, Watershed, regional methods, flood, hydrographic network.

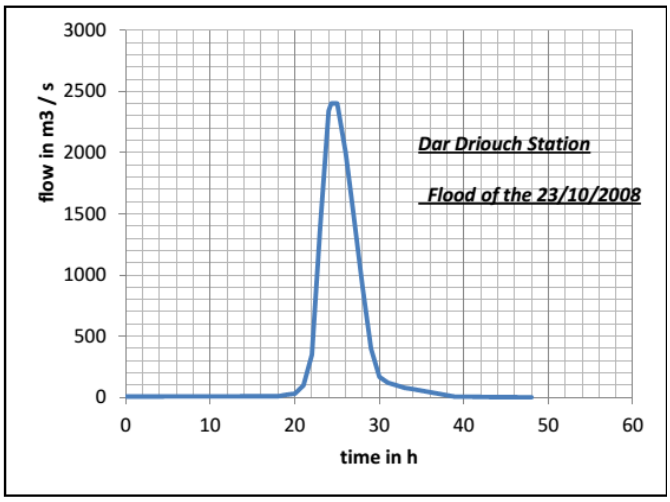

Fig1: hydrograph of the flood of 23/10/2008

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Influence of the nature of recycled sand on the rheological and mechanical properties of cement mortars

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Abstract

Hydroxyapatite The aim of this experimental work is to study the influence of the nature of the recycled sand on the compositions of cement mortars with and without adjuvants, substituting natural sand by different types of recycled sands with different volume percentages of: 0, 30, 50, 75 and 100%. Mixtures of mortars was manufactured according to the conventional standard formulation (sand / cement = 3 and water / cement ratio = 0.5) while maintaining constant their plasticity. Three types of recycled sand were used: recycled sand from old structural concrete (SR1), recycled sand from a recycling quarry (SR2) and recycled sand from structural concrete aged 6 months (SR3), all these recycled sands were pre-wetted 10 min before mixing.

The results obtained show that the rheological properties of cement mortars are influenced by the incorporation of recycled sand above 30%, particularly with that of SR2, which contains a high content of fines (<63 µm). However, the mechanical strengths of recycled mortars are comparable and even they are better than those of the natural mortar for an optimum percentage of 50% with superplasticizer.

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Biography

Author (PhD) has expertise in the characterization and evaluation of recycled aggregates in mortars and concretes. Its purpose is based on the nature, percentage and hydrous state of the recycled aggregates for the civil engineering application. He is a doctoral student at Badji Mokhtar Annaba University, Algeria.

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Technical-economic comparison of different modes of fresh water treatment involving reverse osmosis and ion exchange for boilerwater production

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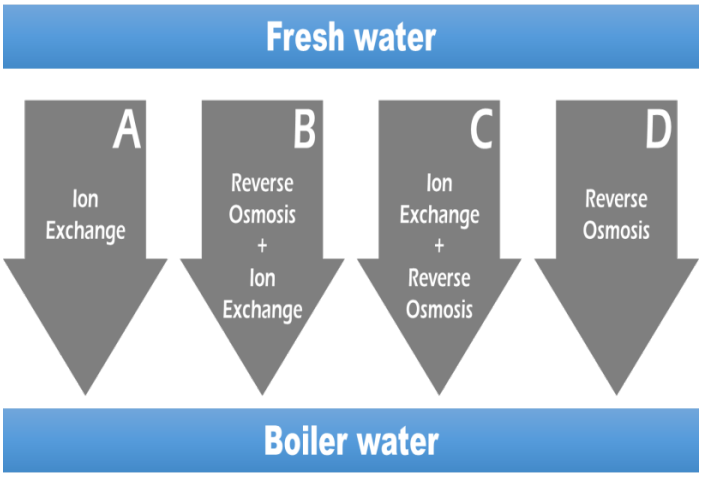
Abstract

The refining or petrochemical industry, phosphates, food industry, power generation are just examples of the multitude of industries that produce steam to be used in the units of their process. And this requires water treatment systems and boilers. Boiler feed water, whether fresh or even potable, must undergo demineralization to a greater or lesser extent depending on the operating pressure. This treatment is achieved by ion exchange and/or reverse osmosis. Some industries adopt ion exchange to produce demineralized water and assume the cost of frequent regeneration of resins, while others have completely replaced the resin treatment with reverse osmosis even if it is an energy-consuming technique according to the desired quality. In this papier, for a given raw water quality and fixing the desirable quality of the treated water, we will do a comparative experimental study of the four treatment processes: (A) Ion exchange alone, (B) reverse osmosis pre-treatment followed by ion exchange, (C) ion exchange pre-treatment followed by reverse osmosis, and (D) reverse osmosis alone. Even though the reverse osmosis-ion exchange system will lead to reduction of resin regeneration products by lengthening the production cycle, this reduction must be economically more important than the investment in the upstream reverse osmosis treatment. The main goal of this work is to show which combination can be technically feasible and economically more profitable, through a comparative study of the technical side at pilot scale and the economic side.



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Biography

PhD Student, the authoris a chemical process engineer from the Ecole Mohammadiad'Ingénieurs. Hisfocus is based on the water treatment field, especially the fresh water treatment for the industrial uses.

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Study and granulometric characterization of the Neogene kert pond deposit of Trebia, the region of Nador North- East Morocco

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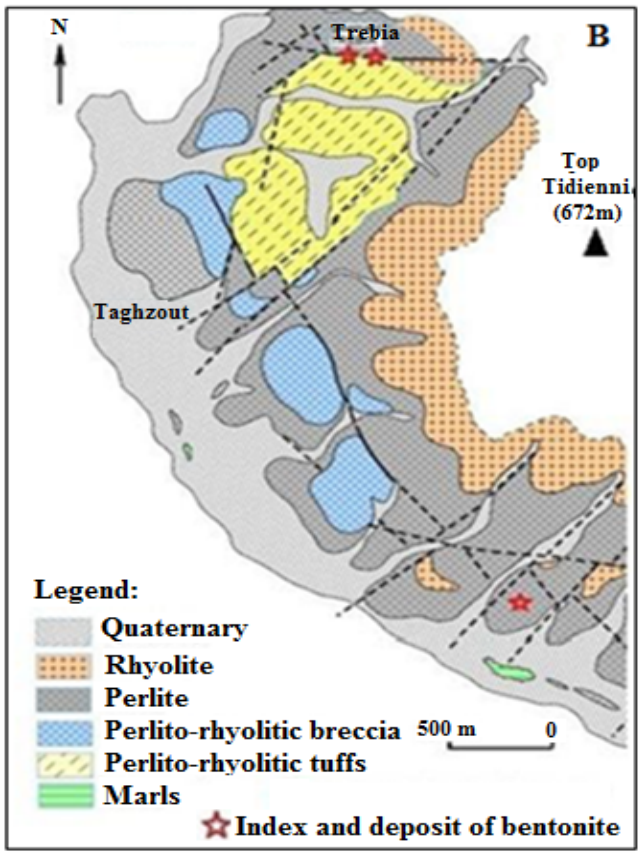
Abstract

This work deals with the study of the granulometric characterization of the Messinian bentonites of the Kert Neogene basin located in the Moroccan Northeast region in the rif chain. It was carried out by analyzing the evolution of the granulometric behavior of the bentonites along the profiles of the deposit. To do this, a sampling campaign was carried out in the form of a tight mesh. The particle size analysis of the Messinian samples was sandy loams, and loamy sands however the clay fraction ranged from 1.665 to 9.094% while the silt fraction from 20.817 to 92.794% and the sand fraction from 1.272 to 77.518%.

The results for grain size indices and their distributions as a function of morphological units have shown that they are generally very fine Sands and very coarse silt, moderately misclassified, very poorly ranked and almost symmetrical.

Figure: Location andthe Geological Survey western flank of Jbel Tidiennit



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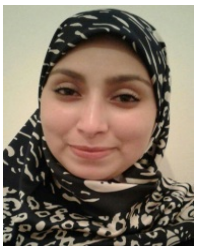

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Assessment of trace element pollution in the fisheries products of the Moroccan Atlanticcoast

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Abstract

The Moroccan coast corresponds to a space of intense economic activities (industrial, agricultural, domestic etc., etc.), and thus constitutes the receptacle of significant quantities of substances of natural or anthropic origin, many of which possess toxic properties.Heavy metals are pollutants whose harmfulness is related to their persistence and their speciation. They are poorly metabolized, so they can be transferred to the food web and accumulate in living matter.In order to assess the level of pollution by metallic trace elements in the Moroccan coast, we have determined the concentration of (Cd, Pb, Ni, Cu, Fe, Zn, Cr) in seawater also in muscles, gills and livers, of *Sardina Pilchardus and Trachurus Trachurus,* caught in the Atlantic coast of Morocco, landed in the port of Casablanca during the autumn and spring of the year 2016. .Concentrations of heavy metals were determined by inductively coupled plasma- atomic emission spectroscopy (ICP-AES). Except the iron and lead the concentrations of the metal elements studied were generally within the limit allowed by the WHO for human consumption.

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Antiobesity Potential of Ten Traditional Edible and Medicinal Plants in Palestine, Organic and Aqueous Extracts; a Comparison Study with Orlistat

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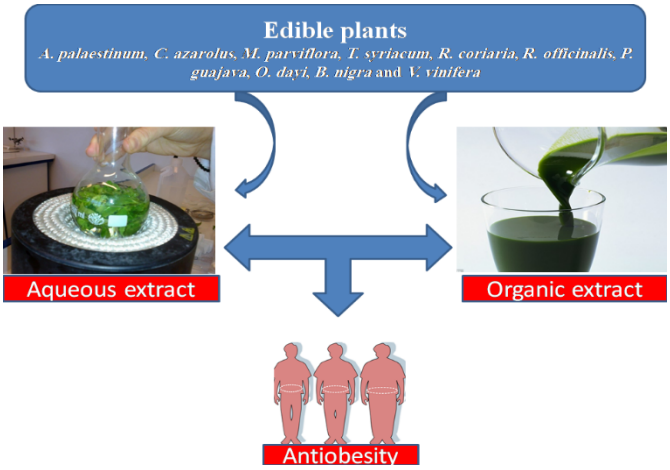
Abstract

Herbals play a fundamental and essential role in the human's life from the ancient times, especially those which are used as food and/or folk medicine due to their nutritive and curative properties at the same time. This study aimed to investigate new antilipase agents from ten Palestinian traditional edible and medicinal plants through the inhibition of absorption of dietary lipids. Antilipase activity for ten plants was evaluated by using porcine pancreatic lipase inhibitory test which was conducted by using the UV- visible spectrophotometer method in comparison with reference compound orlistat. Throughout the aqueous extracts of *Vitis vinifera* and *Rhus coriaria* they have the highest antilipase effect with IC_{50} values 14.13 and 19.95 mcg/ml, respectively. Meanwhile, the organic extract of *Origanum dayi* has IC_{50} value 18.62 mcg/ml. *V. vinifera* showed the highest porcine pancreatic lipase inhibitory effects in comparison with Orlistat which has IC_{50} value12.38 mcg/ml. According to current study obtained results; *V. vinifera*, *R. coriaria,* and *O. dayi* are considered natural inhibitors of pancreatic lipase enzyme and considered new players in obesity treatment. In fact, these plants can be freely and safely consumed in the daily diet or can be prepared as nutraceutical formulations to treat or prevent obesity.



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Biography

Primary author research experience is in the field of pharmacognosy, phytochemistry, pharmaceutical chemistry, ethnopharmacology of the natural medications, isolation of the natural medications from medicinal plants, pharmacoepidemiology and drug safety issues. He was awarded his PhD in 2000 in the field of pharmaceutical chemistry and pharmacognosy from Ukraine. He published more than 100 papers. His H-index is 7 on Scopus.

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Renewable Energies and Sustainable Development

Oral presentations

Modeling and optimization of real-solar refrigeration machines

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[2] Research Unit of Applied Thermodynamics, Technology Department, High Institute of Applied Sciences and Technology University of Gabes, 6029 Gabes, Tunisia

Abstract

A general model for the study and optimization of reversed cycle thermal machines with three heat reservoirs is presented. The model is based on the First and Second Laws of Thermodynamics, heat transfer equations at finite thermal source and sink capacities, and entropy generation terms in order to consider the internal and external irreversibilities of the cycle. The proposed model is applied to real-operating machines for which several constraints are imposed. Some results generated by the model when applied to refrigeration machines are presented. They point out interesting results regarding the limits of the variation range for the model variables under different operating conditions and also for different variation laws for the internal entropy generation term. Sensitivity studies with respect to the evaporator heat transfer area and other decision parameters show the dependence of the refrigerating machines performances on the model variables and decision parameters and what the investment concern is with respect to the gain in performances.

KEY WORDS: Refrigeration machines; Solar Energy; Irreversibilities; Modeling; Optimization.

Biography

Author has her expertise in the modeling of solar refrigeration systems. Her focus is based on the use of thermodynamics laws to minimaze the entropy generation. She was warded her PhD in 2017 from the National School of Engineers of Gabes, University of Gabes, Tunisia. She published more than 03 papers.

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The Link between Renewable Energy, CO2 Emissions and Growth in MENA Region : Linear Versus Non-Linear Approaches

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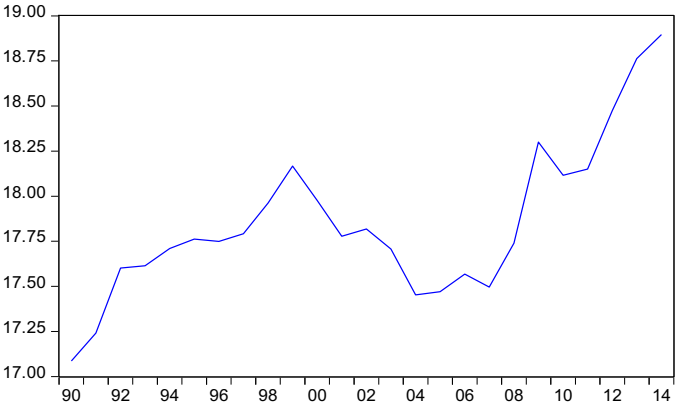
Abstract

In this study we investigate the relationship between renewable energy consumption, CO2 emissions and growth in MENA Region over the period of 1990-2014. In previous studies, this relationship is examined in the linear context and provide mitigated results. By highlighting the limitations of previous works, we try to contrast the linear model with the nonlinear model PSTR (*Panel Smooth Transition Regression*) and try to show what policy makers have to do with respect to renewable energies as a clean energy development to mitigate the emission of CO2 .

Fig.1 Renewable energy consumption (% of total final energy consumption)



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Biography

Abdelkarim Jabri, Ph.D, Dr. Abdelkarim Jabri, Ph.D. in Economics, he is professor at National School of Business and Management (ENCGO), Mohammed Premier University, Oujda- Morocco. His research focuses on nonlinear Panel and Time Series Econometrics applied to Finance, Macroeconomics, and International Trade. he was warded his PhD in 2012 from the University of Paris Ouest Nanterre La Defense, France.

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Investigation of the optical properties of CuIn(Se,S)2 thin filmsfor photovoltaic application.

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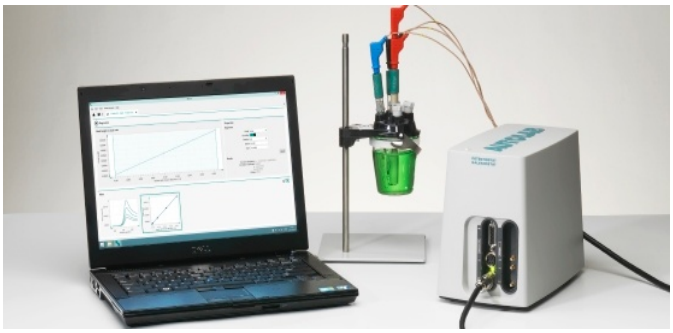
Abstract

In this study, the deposition of CuInSe2 and CuInS2 thin films on ITO substrates by theelectroplating technique was investigated without annealing and with annealing. After optimizing the electrodeposition operating parameters, the films morphology wasexamined by optical microscopy. All optical parameters such as band gap energy, refractiveindex, extinction coefficient and dielectric constant were extracted using visible UVspectroscopy.

Key words: CuInSe2, CuInS2, Thin films, annealing, Spectroscopy, Gap, Refractive index, Dielectric constant.



picture electroplating technique used for the production of thin films.

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5- CIS and CIGS thin films prepared by magnetron sputtering,Miaomiao Li, Fanggao Chang, Chao Li, Cunjun Xia, Procedia Engineering 27 (2012) 12 – 19.

Biography

Amal Bouich is a PhD student, she is developing her research on different techniques for the elaboration of CIS and CIGS thin films for photovoltaic applications.
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Production of the bioenergy from the industrial waste

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Abstract

The use of the biotechnology has purposes of a cleaner production and energy efficiency increased with fewer greenhouse gas emissions and toxic matter. This work is the application of the biotechnological processes for the treatment, the valorization and the exploitation of the industrial waste.

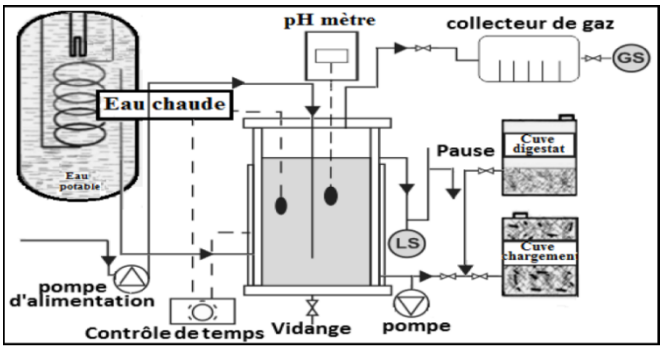
Particularly, our research are directed to the sustainable valorization of the effluent polluting dairy industries by the production of the bioenergy, the latter possesses very high contents in organic matter, considerable concentrations of oils and fats, high levels of DBO_5, DCO, nitrogen and phosphor, important variations of the pH and the temperature and the high conductivity. Our contribution aspires to the elaboration and development of a process to maximize the bioconversion of our cheap substratum added produce it of high value.

The treatment of our dairy effluent is made by the methanization and the validation of an optimal load in a bioreactor of fermentation. The experimental study was led on a bioreactor of one or two phases.

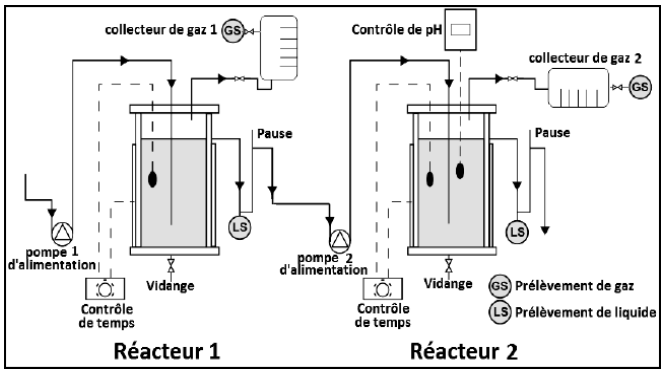
Thus, this work is interested in the evaluation and verification of the performance and treatment limits of the dairy industries by the methanization. We also have, determined factors influencing this type of purification and optimized the parameters of the process of treatments to reduce the diverse characters of pollution and check the efficiency of projects.

The methanization for the effluent treatment is already widely adopted, and it seems to be an alternative solution to the practices at present authorized, and allows valorizing some easily available organic matter in renewable energy.

Key Word: bioenergy, methanization, valorization.



Bioreactor of one phase



Bioreactor of two phases

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Biography

The author studied the treatment and the valorization of the dairy effluents for the production of the bioenergy and then, to decrease the levels of pollution of this effluent. This process can be widely used in the similar waste of food-processing industries. This project is qualified for the preparation of the national doctoral degree at Faculty of Sciences Dhar El Mahraz, Sidi Mohamed Ben Abdellah University (USMBA) Fez, Morocco.

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Heating resistors powered by photovoltaic solar energy

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Abstract

Currently, the international community has mobilized to propose alternatives to contribute to the mitigation of the effects of climate change and innovation in ecological equipmentsthat are adaptable to global warming [1]. At the United Nations Climate Conference (COP 22) in Marrakech (Morocco) in 2016 [2], Among the solutions selected was the promotion of the use of renewable, innovative, high-performance, low-cost and solar-powered energy equipments[2,3].

In the framework of the Moroccan-Walloon Cooperation Program (2018-2022), we propose, in collaboration with the Polytechnic Faculty of Mons (Belgium) (Axe 4, projet 2), the civil society of the Eastern region 'Human and Environment Associationin Berkane HEAB' and the National Initiative for Hummain Development NIHD (Province of Berkane),the design and production of innovative ovens and cooking plates using solar photovoltaic energy (**Figure 1**).This will surely contribute to the socio-economic development of the rural and hurbain areas, and satisfies the domestic needs of the cooking inhabitants, in the homes, by using the electrical energy produced by the photovoltaic panels[4,5].This type of application requires the control of the power supply of the heating resistors by photovoltaic energy, adaptable to the cooking power in the homes. Currently, in the literature, we observe the absence of work on these applications to heat resistance chaffantes high temperature with ainexpensive cost and satisfactory performance.

In this paper, we present the results of modelizations, electrical and thermal operation of the thermal resistance heated by the photovoltaic energy in order to use them in ovens and cooking plates. The first obtained results show, under an illumination of 800W / $m^2$and ambient temperature of 35°C, the temperatures of the resistance which reaches avalue of 582°Cunder an electric power of 144 W. From the fine modeling of the obtained results, we have shown, on the one hand, a very good agreement between experience and simulation, and on the other hand, the possibility of using these resistors in the systems that heat the ovens and solar cookers (**Figure 1**).

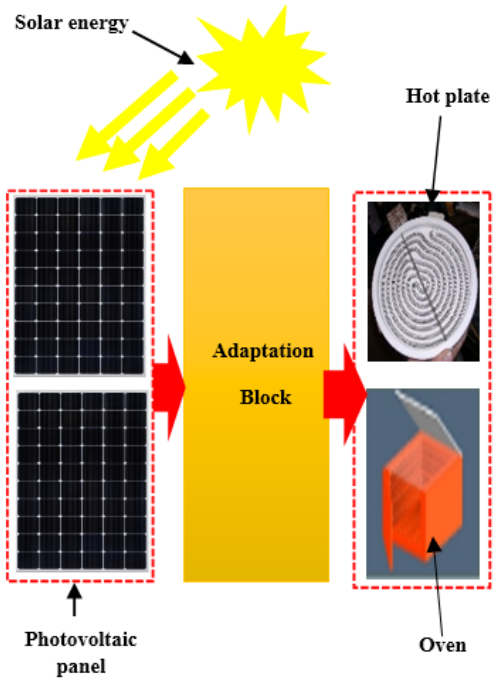

Figure 1:Oven and cooker operating with photovoltaic solar energy

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Biography

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System of control and supervision of the solar distiller to be installed in Douar Al Hamri (Berkane)

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Abstract

Climate change and global warming are causing sea level rise and thus the degradation of groundwater quality by excess salt. In this context, the purpose of this work, is the establishment of a system for the remote acquisition and supervision of a multi-stage solar distiller to supply drinking water to the Douar Al Hamri in the rural district of Boughriba in the province of Berkane (Oujda Region). The project falls within the framework of the Moroccan-German Program of Scientific Research 'Project PMARS 2015-64'.

The distiller (See Figure), designed and built by Solar-Institut Jülich (SIJ, Germany) and Ingenieurbüro für Energie und Umwelt (IBEU, Germnay), is planned to be equipped with solar collectors, photovoltaic generators and inverter to connect to the power grid.

As shown in the figure, the solar distiller will be equipped with a remote control and supervision system, made in the LESPRE laboratory of Oujda, for the acquisition and storage of data (including: electrical information, lighting, temperature, salinity, etc.). Then send them, via a USB link, to an interface, created in Labview language, installed on a PC. The latter sends the data over the internet to a web server installed at the laboratory server (80 km from Douar) which shares the information with all reliable users. The system implemented in this project will allow instantaneous monitoring the operation of the station in real time to ensure the amount and quality of produced fresh water, and remote intervention in case of failure or malfunctioning of the systems.

In this paper, after describing the operation of the solar distiller, the structure of its control and supervision system is presented, including: the start-up and shutdown of the distiller, tracking of its functionality, data acquisition, and control connection to the electricity grid or photovoltaic generators.

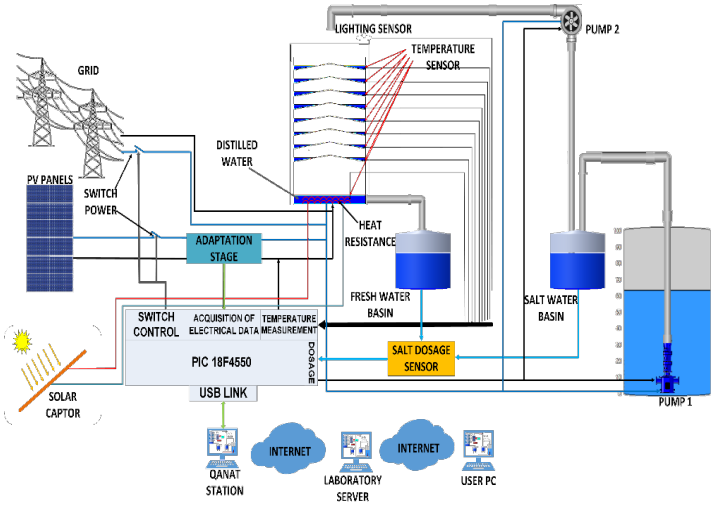

Figure: Multi-stage solar distiller equipped with a control and supervision system.

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Biography

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Conception and simulation of the functioning of a multi-stage solar distillerto be installed in Douar Al Hamri (Berkane)

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Abstract

In Morocco, as in the developing countries, the supply of drinking water is becoming every day more worrying, the fact of climatic vagaries persistent, of population growth and the rise in the level of life. Several techniques of purification of water are used to large scales, such as the multi-effect distillation and reverse osmosis, requiring technical means complex and expensive [1-5].However, the use of the multi-stage solar distillation method, particularly in rural and desert areas with high solar insolation, could fill the deficit of lack of drinking water in these areas with and technical means largely advantageous.

In this context, the objective of this work, which is part of the Moroccan-German Scientific-Research Program 'Project PMARS2015-64', is the study, conception and implementation of a multi-stage solar distiller to supply drinking water the Douar Al Hamri, of the rural commune of Boughriba in the province of Berkane (Oujda region) (**Figure**).The quantity of the water produced is estimated at 80-90 liters during the sunny day; and 90 liters during the night when the distiller is connected to the national network of electricity and drinking water ONEEP.

In this work, we present the first simulation results of the four-stage of solar distiller, coupled with five surface of thermal collectors 2 m^2 of each, exposed to the sun and temperature of Douar. The results obtained from the resolution of equations governing the heat transfer in the distiller, show that the total production of drinking water is 70 l/day, the maximum temperatures of the first and fourth stage are respectively 99°C and 85°C (ie a variation of 14 °C). The results obtained and the estimate of the overall hourly yield of 0.53 kg/m^2.h shows, on the one hand, the good functionning of the solar distiller and, on the other hand, the performances fixed by specifications of the distiller.

In perspective, all the results obtained will be validated on the ground (Dour Al Hamri of the rural commune of Boughriba) after the installation of the solar still, which is being manufactured at the Solar Institute of Julich in Allemgane (SIJ).

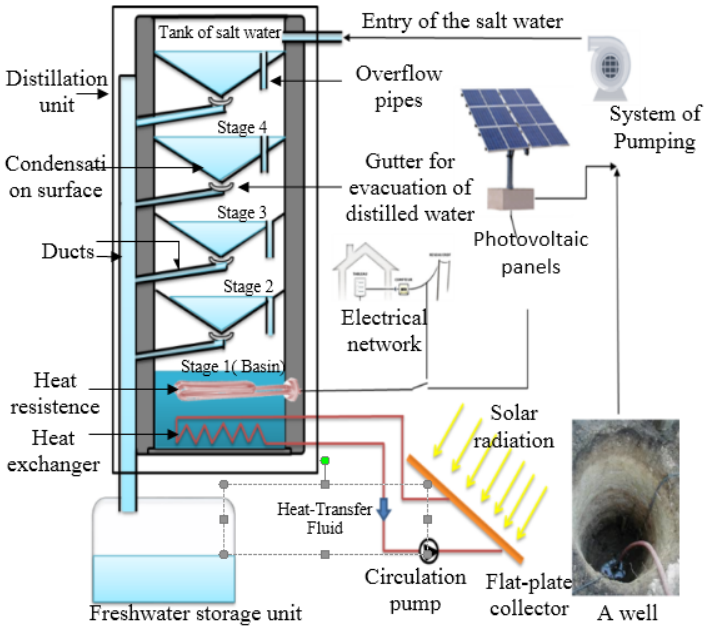

Figure: The schematic diagram of multi-stage solar distillationsystem

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Biography

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Preparation and characterization of spin coated CZTS Thin Films Elaborated by Sol Gel Method for Solar Cells Applications

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Abstract

In this research work, we study the effect of annealing time on the structural, optical and electrical properties of elaborated Cu_2ZnSnS_4 (CZTS) thin films using low cost sol gel method associated to spin coating technique. The sol gel solution CZTS was deposited on the ordinary glass substrates and annealed at 300°C using different durations: 5 min, 10 min and 15 min. Then, the samples are characterized using X-ray diffract-meter, UV-VIS spectrophotometer and four point probe. The obtained results show that the CZTS thin films crystalize in a Kesterite structure with a privileged orientation along (112) plane. The optical parameters such as, absorption coefficient (α), band gap energy (Eg) , refractive index (n), extinction coefficient (k), real dielectric constant (ε_r), imaginary dielectric constant (ε_i) and optical conductivity (σ_{opt}) of dielectric constants have been calculated from the transmittance/absorbance data in the wavelength ranging from 350 to 1000 nm, and the estimated gap energy is between 1.51 and 1.84 eV. The obtained electrical resistivity is between 0.30 and 0.49 Ω.cm, which means a suitable conductivity and favorable CZTS films for photovoltaic applications.

Keywords: CZTS, thin films, spin coating, X-ray diffractometer, fourpoint probe.

Biography

Authorstarted his PhD in physics at the University Hassan II, Faculty of Sciences Ben Msik- Casablanca in November 2015, his work is focused on the field of fabrication of CZTS materials in thin films nanostructures using low cost techniques for photovoltaic application. He has participated in several international conferences. And Now, he published three papers.

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Gas flow modelling inside a DCFC cathode using the lattice-Boltzmann method

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Abstract

The demand for electric energy is continuously increasing and exhausts the fossil energies. This fact impacts the availability and price of all natural resources. For that reason, we need to look up for new and efficient alternative energy sources. Fuel cells are among the alternatives that have been reported in the literature. A fuel cell is an electrochemical reactor that allows direct conversion of the chemical energy of reactants to electrical power. The present study focuses on the gas mixture flow through the porous cathode of a direct carbon fuel cell (DCFC). The mass rate reaching the reaction interface and its distribution on this interface is of major importance for the DCFC performance. In fact, the rate of chemical reactions occurring on this interface is extremely influenced by the presence of the reactants. The lattice-Boltzmann method with the MRT scheme was used as a numerical method to simulate the gas flow inside the cathode channel and the porous zone sketched in Fig. 1. The effect of the permeability of the porous zone on the distribution of the gas mixture that reaches the reaction interface is studied.

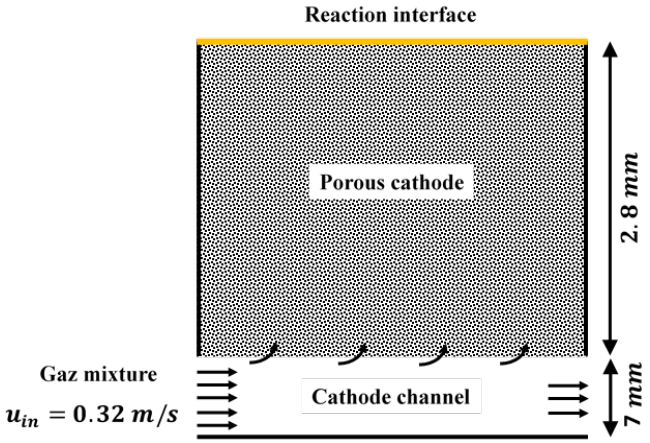

Fig. 1 Schematic view of the DCFC cathode

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Biography

Ismail Filahireceived the Bachelor and Master degrees from Cadi Ayyad University, Marrakesh, Morocco, in 2013, and 2015, respectively. He is currently a Ph.D student in Cadi Ayyad University. His main areas of research interest are computational fluid dynamics, heat transfer, and renewable energy.

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Electronic and photovoltaic properties of [1,2-b][1,2,4]triazine derivatives for efficient dye-sensitized solar cell

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Abstract

Photovoltaic (PV) devices are unique in that they directly convert the incident solar radiation into electricity, with no noise, pollution, making them robust and reliable. Among the PV devices, dye-sensitized solar cell (DSSC) are a third generation PV cell, they have been viewed as promising candidates for green energy devices owing to the low cost, easy fabrication process, potential indoor applications and relatively high efficiency. A common organic dye for DSSCs contains a structure of electron donor/acceptor (D-A) linked through a π-conjugated bridge, which is termed the D-π-D molecular structure. The π-conjugated bridge has a great influence on photo electronic properties of the D-π-D dyes. In this study, the electronic structure and optical absorption properties were calculated by using DFT, of four dye sensitizers: ethyl 7-cyano-2,6-dioxo-3,8-di-p-tolyl-2,3,4,6-tetrahydro-1H-pyrido[1,2-b][1,2,4]triazine-9-carboxylate (SH138), 2,6-dioxo-3,8-di-p-tolyl-2,3,4,6-tetrahydro-1H-pyrido[1,2-b][1,2,4]triazine-7,9-dicarbonitrile (SH159), 3-(4-chlorophenyl)-2,6-dioxo-8-phenyl-2,3,4,6-tetrahydro-1H-pyrido[1,2-b][1,2,4]triazine-7,9-dicarbonitrile (SH126) and ethyl 8-(4-chlorophenyl)-7-cyano-2,6-dioxo-3-(p-tolyl)-2,3,4,6-tetrahydro-1H-pyrido[1,2-b][1,2,4]triazine-9-carboxylate (SH170). Based upon the calculated results, we analyzed the role of different electron-donor groups in the tuning the geometries, electronic structures and optical properties. Also, we aimed to see the sensitizer donor effects on the open circuit photovoltage (Voc) and the short-circuit current density (Jsc) of the cell through discussing the key factors affecting Voc and Jsc with the goal of finding potential sensitizers for use in dye sensitized solar cell (DSSC).

Keywords: Triazine derivatives, DFT, Organic photovoltaic, dye sensitized solar cell.

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Optimization of conditions of thermal regeneration of activated carbon used in gold industry: application of response surface methodology

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Abstract

Saturated activated carbon (Gold Sorb) at the end of its life in the gold ore processing unit CIL, has been regenerated using thermal regeneration technique with steam as activating agent. To optimize the regeneration process the response surface methodology (RSM) was applied, the optimized conditions are observed to be a steam flow X1=0.5 g(H2O)/g(AC), a regeneration time X2=28.4min and a regeneration temperature X3= 732°C, while the corresponding yield is Y1= 90.12%, the gold adsorption capacity is Y2= 52.47% and the attrition is Y3= 4.51%. The characterization of regenerated activated carbon was performed from SEM, BET and the iodine number. The regeneration efficiency was calculated from the gold adsorption capacity (74.29 %), iodine number (86.72 %), and specific surface area (92.00 %).

KEYWORDS: Activated carbon, thermal regeneration, optimization, gold recovery, RSM.

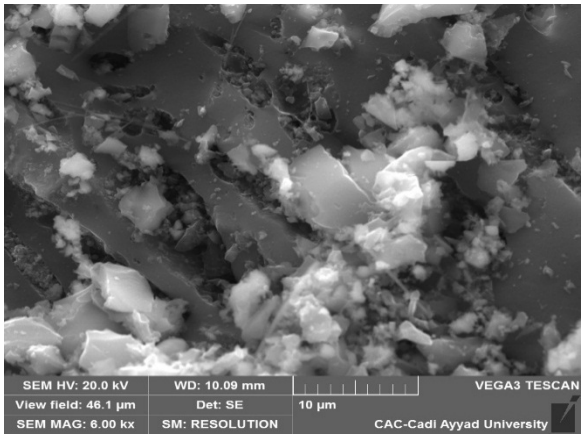

***Fig12**: SEM micrographs of saturated activated carbon (Gold Sorb) 10 µm scale bar.*

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Physico-chemical characterization of Tunisian Sand from the area of Sened

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Abstract

In order to widen the industrial uses of the Jebel Orbata Sened sand (Gafsa, Tunisia), different investigations have been made to characterize the natural raw material using several techniques. The analyses were carried out by X-ray diffraction (XRD) as well as by microscopic observations under a scanning microscope (SEM) and in transmission (TEM). The results obtained show that they are quartzo-feldspathic sands. Mineralogical and physicochemical characterizations indicated that the pure sand of Jebel Orbata in Sened could be of great interest in the industry sector.

Keywords*:* Sand, characterization, X-rays diffraction, quartzo-feldspathic sand

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Numerical Modeling of Plasma Silicon Discharge for Photovoltaic Application

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Abstract

In this work, we perform a Numerical Modeling of silicon thin film deposition for a Photovoltaic Application in a Capacitive Coupled Plasma reactor (CCP). Plasma equations are solved by Numerical Method. The deposition is done by plasma of Silicon diluted with Argon and Hydrogen in low pressure. The results obtained show the fundamental features of plasma discharge such as density, temperature, and electrical potential.

Key words: Numerical modeling, RF Plasma, CCP reactor, SiH4/Ar/H2, Finite Element Method.

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Numerical study of the structural static and fatigue strength of wind turbine blades

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Abstract

Wind turbine blades are highly complex structures with complex 3 dimensional forms governed by their aerodynamics that allow a maximum of power output and efficiency. On the structural side there is always an immense interest in keeping the blades as light and as rigid as possible. No structure being perfectly rigid, the wind turbine blades are specifically designed to keep their deformation in check. Deflection twist couplings are also designed into the blades to have favorable aerodynamic properties even in the deformed state. A combination of experimental and numerical work has been used to address the most critical failure mechanisms and to get an understanding of the complex structural behavior of wind turbine blades. Different failure mechanisms observed during the tests performed for reduced scale tests (smaller test specimens) and the corresponding FE-analysis are presented.

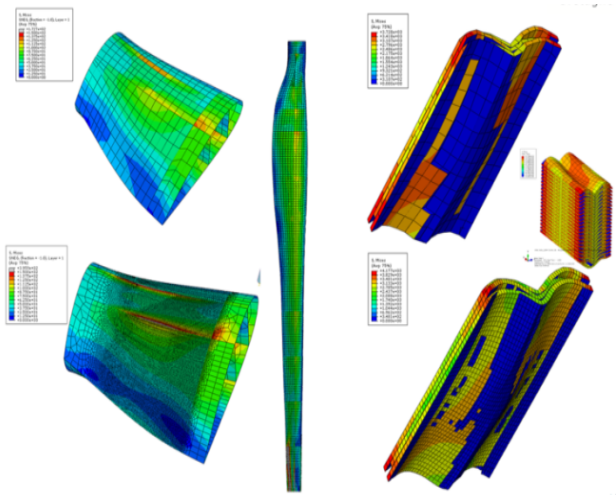

Figure 1: Multi-scale modeling of an offshore wind turbine blade

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Biography

Mostapha TARFAOUI Professor researcher at ENSTA Bretagne and expert in composite materials for marine renewable energies. He obtained his PhD in Engineering Science in 1999 at the University of Haute Alsace Mulhouse. Mostapha TARFAOUI's research focuses on theoretical and numerical modeling of materials and structures with multiphysics and thermomechanical coupling such as materials and intelligent structures. Its research results are published in international scientific journals, have led to advances in composite materials and numerical modeling of structures his research activities articulatearound the development of experimental, theoretical and numerical approaches for a betterdescription of the elastic behavior of damaged composite/Nanocomposites material underdynamic loading in terms of dynamic response and damage kinetic. Thehot line of this workis the comprehension of the appearance and the evolution of damage. This comprehensionaims to better describing, simulating and optimizing the macroscopic behavior of compositeand nanocomposites materials by multi scales approaches and by integrating certain aspects oftheir microstructure. For this objective, my research tasks are undertaken by developing twocomplementary approaches jointly: the experimental investigation and multi scales modellingof the mechanical behavior. These two approaches were enriched by a third orientation. Thisone relates to the numerical developments of algorithms aiming at implementing the behaviorlaws in structures computer codes by using finite elements method. These laws are developedfor the modelling of the dynamic response, the produced damage and residual strength and/orare identified directly through experimental and numerical procedures. The development ofthe experimental approach enabled me to set up, to validate and exploit original experimentalmethodologies for the follow-up and the identification of damage processes.

Remote sensing contribution to the identification of potential geothermal deposits: a case study of the Moroccan Sahara

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Abstract

Geothermal energy refers to any heat stored, naturally, in the earth's crust and is considered as renewable, ecological, universal and sustainable energy. In Morocco, geothermal energy is not yet exploited; and, it is also not on the agenda in terms of research and development to support the institutional energy mainly focused on solar and wind energy, apart from some university research and some general punctual interventions. Remote sensing is a preliminary prospection tool for geothermal research allowing to face the constraint of the lack of valuable data and also the absence of officially credible data which will allow us to successfully complete our study.

The main purpose of this research is to locate potential geothermal resources, in the Moroccan Sahara, using remote sensing and geospatial technologies. A set of satellite images (MODIS, ASTER and Landsat) were used and were completely processed and analyzed. Furthermore, several more significant indices of the magnitude in question were calculated from satellite imagery to prospect for potential deposits, namely diurnal and nocturnal surface temperature, hydrothermal alteration indices layer of lineaments density.

This study allowed us to detect nocturnal thermal anomalies in the locality of TICHLA. The statistical analysis showed a strong correlation between the intensities of the different indices in the area in question, which leads us to conclude that this locality has a strong potential for geothermal reservoirs. This same geothermal energy prospecting methodology can be applied to any site in Morocco and even the whole world, thus giving remote sensing its status as an important tool for the preliminary identification of potential geothermal energy deposits.

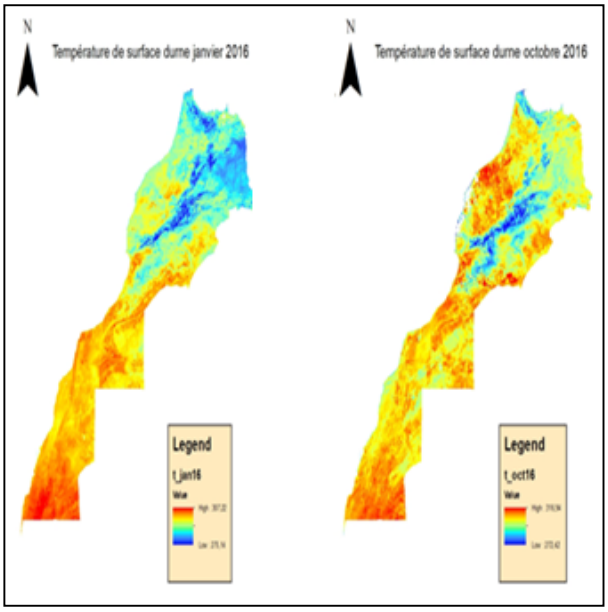

Figure 2. Diurnal land surface temperature showing an important thermal anomaly in the Moroccan Sahara.

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Biography

Abderrahim El_bouazouli is a responsible of research and development in Hassania School of Public Works (EHTP) and specialist in geothermal resources field. Actually, he is follows his PhD study in the geothermal deposits as renewable, ecological, universal and sustainable energy. He obtained his Engineer Degree in Earth Sciences in 1986 in Mineral Industry National School of Rabat; a Master degree in project and Property Management in 1994 in Special School of Public Works of Paris, France; Graduate of Specialized Higher Studies in 1995 of grouping National School of Bridges and Pavements - Special School of Architecture - University Pantheon Sorbonne, France; Master's Degree in Engineering Education and Training in 2003 from the Lille University, France.

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Posters

Étude et Modélisation d'un Générateur Thermoélectrique

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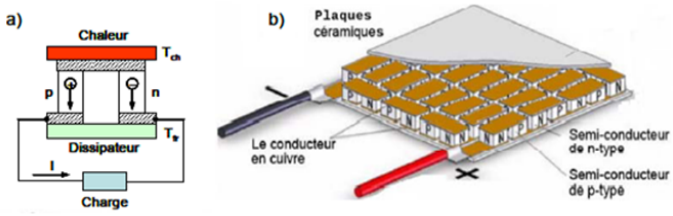
Abstract

Current generation by thermoelectric effect appears as an interesting source to relieve current energy problems, by taking advantage of the transformation of enormous amounts of waste heat released for example by cars, ... into useful energy. The objectives of our work are the study and modeling of a thermoelectric generator. Thus, after presenting the basics of thermoelectricity, also reviewing the physical and chemical properties of thermoelectric materials and current thermo-electric applications, Matlab modeling and dimensioning of a thermoelectric generator was investigated.

La génération de courant par effet thermoélectrique apparaît comme une source intéressante pour soulager les problèmes énergétiques actuels, en mettant à profit la transformation des énormes quantités de chaleur perdues dégagées par exemple par les voitures, en énergie utile. Les objectifs de notre travail sont l'étude et la modélisation d'un générateur thermoélectrique. Ainsi, après avoir présenté les notions de base de la thermoélectricité, passant également en revue les propriétés physiques et chimiques des matériaux thermoélectriques et les applications thermoélectriques actuelles, on s'est intéressé à la modélisation et au dimensionnement par Matlab d'un géné-rateur thermoélectrique.



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Preservation and sustainable management of groups at *Pistacia atlantica* in the Western Saharan Atlas (Algeria)

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Abstract

The Pistachio Atlas (Pistacia atlantica) groups occupy large areas in the south-west of Algeria following the diversity of edaphic and geomorphological and bioclimatic landscapes that range from semi-arid and arid to Saharan, on different types of soil, but in scattered and isolated situation in valley beds, talweg, slope, mountain and dayas. The study aims to quantify the richness and floristic diversity in these groupings using the technique of linear transects and floristic surveys. Our investigation is based on the comparison of 136 floristic records and their groupings by floristic and ecological affinities. The results show a qualitative and quantitative heterogeneity according to the descriptors used (geomorphology, hydro-logical, pedological and bioclimatic).The floristic inventory carried out on the range of the grouping in *Pistacia atlantica*, makes it possible to list 186 botanical taxa belonging to 135 genera and 39 families were identified. The main inventoried families of Asteraceae, Poaceae, Fabaceae and Brassicaceae Biogeographically, the genetic diversity is dominated by Mediterranean elements and Saharo-sindiens on the depressions and the tops of mountains. In the framework of sustainable development for the rehabilitation of the groups in *Pistacia atlantica*, it is necessary to apply an adequate management strategy in order to preserve the natural regeneration of the species and to put in place a regulatory framework of rigorous protection of the *Pistacia atlantica* throughout its range against any degradation factor. A mastery of phytoecological and phytogenetic knowledge of the Pistacia atantica groupings should allow in the future its extension and its maintenance in the South-West of Algeria.

Key words: *Pistacia atlantica*, groupings, Saharan Atlas, Sustainable management, rehabilitation.

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Biography

Phd researcher since 2012, Department of Natural Sciences and Life, Salhi Ahmed University Center of Naama, Algeria.

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Design and implementation of intelligent MPPT control of the maximum power of PV modules

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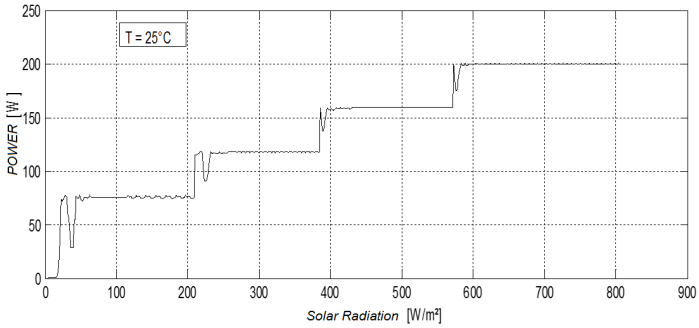
Abstract

The purpose of this project is to operate a photovoltaic system with the maximum energy produced whatever the weather conditions (temperature and lighting). We present the modeling and the simulation of the ideal behavior of the photovoltaic cell under Matlab Simulink®. We studied the influence of the different configuration series / parallel of the cells on the current / voltage characteristics of the photovoltaic generator either for constant meteorological conditions, or variables in order to compare their effects on the variation of the short-circuit current and the open circuit voltage of the generator. We detailed all the steps of mathematical modeling of the different types of DC / DC static converter, as well as a comparative description of the five methods of pursuing maximum power point considered (PandO, Incremental Conductance, constant current, constant voltage and fuzzy logic).

Simulation of the P&O command with variable weather conditions



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Biography

Sana Moslim is recently awarded his Master degree in electrical from the polytechnic school of Agadir. She is Ph.D Student at the International University of Agadir in collaboration with Ibn Zohr University.

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The effect of curing temperature on high volume fly ash mortar

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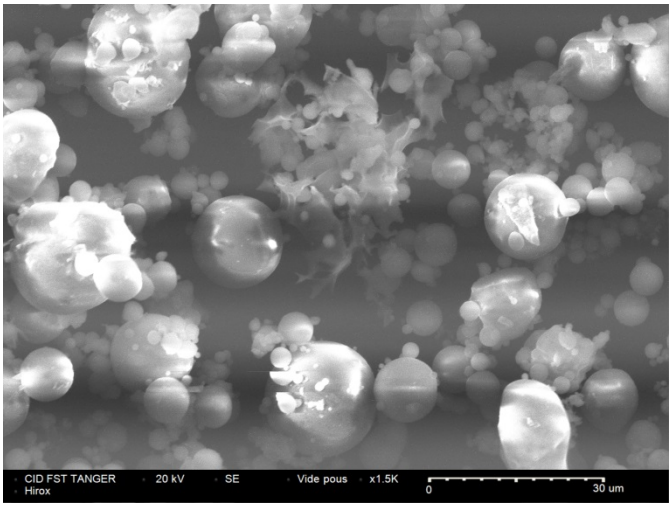
Abstract

The addition of fly ash has advantages for substituting a certain amount of cement during the development of mortars / concretes. This act will reduce the consumption of cement and will generate a significant environmental impact. However, this substitution is not made without a direct impact on the properties of the concrete, particularly the mechanical properties. The bibliographic study has shown that the addition of fly ash is limited by a low level not exceeding 30% by mass of cement. Beyond this quantity, the concrete loses its mechanical qualities at a young age.

The present experimental study will be the subject of a high volume fly ash mortar (high substitution rate 50% of Class F Moroccan fly ash). This incorporation shows a decrease in the mechanical properties at a young age compared to the 0% CV mortar, which has been improved in our study by using a low C3A cement to reduce the possibility of formation of ettringite, crushed fly ash of less than 100 µm average size to increase their reactivity and a heat treatment at different temperatures 20 °C, 40 °C and 60 °C, this is in order to tackle the cause of the weakening of the mechanical properties at a young age and to achieve an acceptable compressive strength to 28 days .



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Biography

PhD Student in the Faculty of Sciences and Technologies, Tangier. Morocco. Holder of a Master's degree civil engineering at the FSTT.Morocco.

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On the Impact of Surface Discontinuity and Hill-effect on Dispersion of PM Emissions: Case of the Industrial Area of Anza

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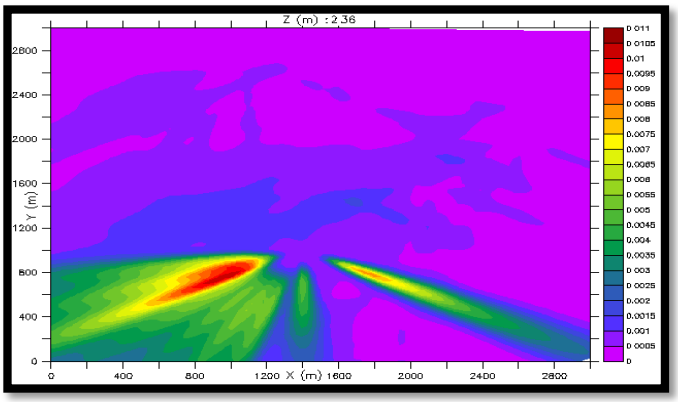
Abstract

The Emissions of fine particles (PM) generated by factory chimneys and line sources (Road Traffic) in the Anza industrial region, at ground level are less dispersed than in similar situations. In fact, these emissions are distributed in the south, south-east and a large part towards the south-west of the neighboring region up to 1x1Km^2. The hill effect and the direction of the wind (because of the discontinuity of the surface) are clearly perceptible in the developed pollution map using our model. Average PM concentrations, at ground level, are reported in the adjacent figure.

The results of the simulation also show that the particle concentrations are relatively low compared to the similar previous case studies, up to a maximum concentration of 11 µg / m^3. A large part of these emissions is transported and distributed on the South West of the industrial units.

Figure 1: Location of point sources, line sources, and surface discontinuity represented by the land-sea boundary

Figure 2: Concentrations of fine particles (PM) in mgm^{-3} distributed on the XY at ground level at 15:00.



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Biography

Dr. Hicham GOURGUE is awarded his Ph.Din Environmental Physics from Ibn Zohr University. He is currently Responsible for the research team of Materials, Environment and Renewable Energies at the International University of Agadir. He is author and co-author of a number of scientific papers published in several international journals and conferences.

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Modeling tidal current energy extraction in Sebou estuary (Morocco)

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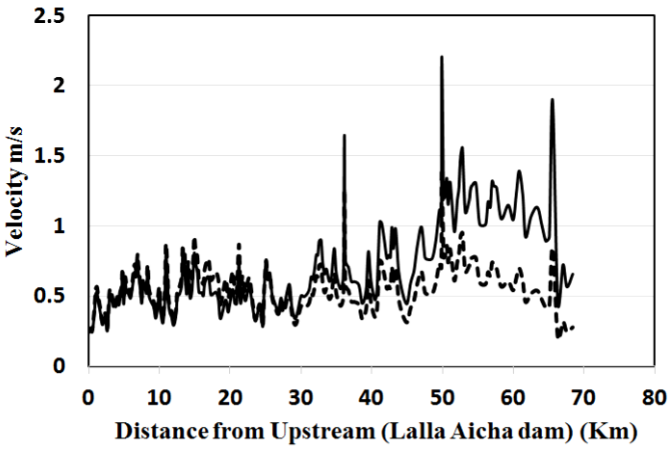
Abstract

Tides are a constant and predictable source of energy. Tidal current energy converters can capture the kinetic energy of the tidal streams by driving a generator that converts the energy into electricity. It offers a predictable energy in comparison with other renewable energy sources which involve a higher level of uncertainty in the estimation of the available resource. In this study, Sebou river estuary (North of Morocco) is taking as an application area. The tide near the estuary mouth is mainly semi-diurnal with a 12.45 hours tidal cycle and is a meso/micro-tidal estuary. The flow regime at the level of the Sebou estuary is marked by considerable seasonal and inter-annual variations. It is under the influence of the tide regime and under the control of many dams.

The study shows that this estuary have tidal currents over 1 m/s, reaching spring values over 1.5 m/s at specific locations, which is favorable for renewable electricity generation. As energy extraction predictions in a real-world site is a very complex process that requires consideration of multiple factors, a hydrodynamic model (MASCARET 1D) was used to assist for tidal energy extraction emplacements. The modeling results were calibrated and validated with water level measurements of 2014. Through the model simulations, the annual energy density per location was estimated, and three locations were found to be ideal for tidal energy farms installation. Tidal energy extraction using the state of the art turbines converters was estimated and these technologies were compared. Finally, a geographic information system (GIS) was used for mapping of tidal energy potential on high and low Tides.



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Biography

Igouzal Mohammed is working as a professor in the Department of Physics Faculty of Science, Ibn tofail University, Morocco. His research field includes: River Hydraulics, Water quality, Transport modeling, Desalination process and modeling. He was awarded his Phd 2003 from Ibn Tofail University and did a post-doctoral stay in Ecole des Ponts et Chaussées (France). He published more than 15 papers. In parallel he is co-inventor of two patents and is responsible of patents management in Ibn Tofail University .

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Study of a solar absorption refrigeration machine under Moroccan climate

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Abstract

The present work deals with thestudyofasolarabsorption refrigeration machine (water-ammonia) intheclimate of Morocco (Rabat site: latitude 34 °02'North and longitude 06 °48' west). A simulation computer program written in FORTRANis performed to simulate the operation thermodynamics of the machine using the actual weather data of radiation and ambient temperatures.The absorption machineis equipped with a distillation column to purify the ammonia coming out of the generator, which has a negative effect on the performance of the machine. The results obtained highlight the influence of the distillation column on the performance of the solar absorption machine. The results show that to equipthe machine with adistillation column lowers the operating temperature of the hot source of tendegrees,which has an impact on the choice of sensors used and their performance. And the coefficient of solar performance increases by 30%.

Key words: Absorption system, solar refrigeration, water-ammonia, distillation column, coefficient of performance.

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Electronic and photovoltaic properties of new four 4H-pyran derivatives as solar cells materials

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Abstract

Organic photovoltaic solar cells are an important potential of development in the search for low-cost modules for the production of domestic electricity; more and more attentions are paid to the solar energy utilizations, considering the environmental issue and renewable resources. Dye-sensitized solar cells (DSSC) have attracted an ever-increasing attention in scientific research and in practical applications since the first report by Hagfeldt and Grätzel in 2000, because of its potential advantages, such as low cost and highly efficient conversion of sunlight into electricity. In this work, the electronic structure and optical absorption properties of new four pyran derivatives dye sensitizers were calculated by using density functional theory (DFT) and time dependant DFT (TDDFT). Based upon the calculated results, we analyzed the role of different electron-donor groups in the tuning the geometries, electronic structures and optical properties. Also, we aimed to see the sensitizer donor effects on the open circuit photovoltage (Voc) and the shortcircuit current density (Jsc) of the cell through discussing the key factors affecting Voc and Jsc with the goal of finding potential sensitizers for use in DSSC.

Keywords: Pyran derivatives, Solar cells, DFT, Electronic properties, DFT-TDDFT.

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Electrical Engineering and Physics Simulations

Oral presentations

Towards an evaluation of marine fuels for a clean and efficient autonomous ship propulsion

Abdelmoula Ait Allal, Khalifa Mansouri, Mohamed Youssfi, Mohammed Qbadou

Laboratory: signals, distributed systems and Artificial Intelligence (SSDIA) ENSET Mohammedia, University Hassan II Casablanca

Abstract

The seaborn trade is considered as the engine for an inclusive and a sustainable growth and development of the worldwide economy. It has the biggest share in the global trade in term of volume and value. For the last decades, the seaborn trade has maintained its growth trend, resulting in the increase of number of ships. This increase of shipping fleet has been accompanied with increase of fuels consumption and harmful to the environment. Various types of marine fuels have been used for the propulsion of ships depending on ship size, type of engine and trading area. However, the use of marine fuels, in particular heavy fuel oil for the propulsion of ship, generate greenhouse gases emission, waste, and in case of oil spill cause harmful to the marine ecosystem. In order to limit and reduce this environmental impacts, the international maritime organization has established several stricter regulations, which are enforced in some sensitive areas called “emission control areas”. These regulations concern among others, the air pollution prevention and oil pollution prevention. The implementation of these regulations has put pressure on shipowners either to shift to other clean energy, installation of abatement technologies, retrofit of propulsion system, retrofit of ship design, implementation of energy efficiency management system or looking forward to implement the autonomous ship as an alternative solution for a future sustainable maritime industry. The purpose of this paper, is to evaluate the different types of nowadays marine fuels, in term of their compliance with the compulsory environmental regulations, cost-effectiveness and their suitability to be used for the future autonomous ship propulsion.

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Biography

From 1990 to 2006 working on board as Merchant Marine Chief engineer after graduation from High institute of maritime studies at Casablanca (ISEM). From 2006 till now, Working with DNVGL as Senior Maritime Expert and certification auditor (ISO 9001/14001- 2015, international safety management system (ISM), International ship and port facility security code (ISPS), Maritime labour convention (MLC)). PHD student researcher in the Higher Normal School of Technical Education (ENSET), University Hassan II of Casablanca / Morocco. Laboratory of signals, distributed systems and artificial intelligence (SSDIA). Area of research: Autonomous ship technology and its implementation in the maritime industry. Shipping environmental and social impacts.

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Modeling and real time simulation of an HVDC link in dynamic state using RT-lab platform

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Abstract

In this paper a real time simulation of a 12-pulse HVDC (High Voltage direct current) is modulated and simulated in dynamic state after single AC fault, which the HVDC inverter is connected to a weak AC system. A serious kind of disturbance is applied at the inverter side in objective to study the dynamic performance of the HVDC system. Influence of the DC control on recovery from commutation failure is tested with two different values of time rising of the mechanism addressed to maintain the stability of the system, to ensure a good recovery from fault and also inhibiting the commutation failures at the HVDC inverter. The results obtained are validated by simulation results in RT-lab platform using the digital Real time simulator HYPERSIM (OP-5600). The results carried out shows the influence of the DC control on the behavior of the system and also in order to ensure a safe and a good recovery from fault.

Fig 1. Hypersim hardware-OP5600

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Biography

MANKOUR Mohamed: He received the Eng degree in electro-technical engineering from Djillali Liabes University of Sidi-Bel-Abbes in 2010, and the magister's degrees from polytechnic school of ORAN ENPO-MA in 2013. He is currently, PhD student in electro-technical Engineering Department of polytechnic school of Oran ENPO, Algeria. He is Member of the «SCAMRE» laboratory. His main field of interest includes FACTS devices, HVDC systems, electrical networks and real time simulation.

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Non-Destructive Testing of an Electron Accelerators Used in Oncology

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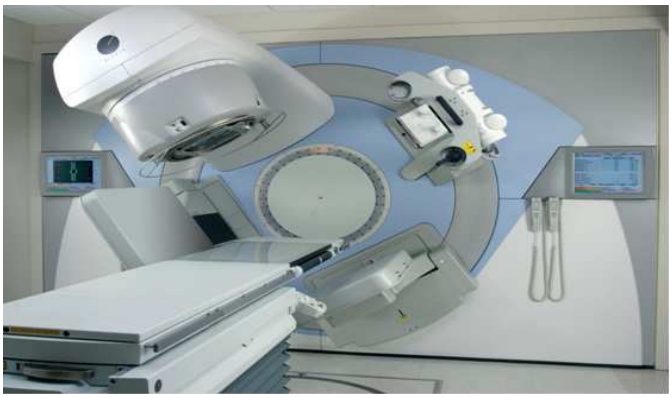
Abstract

The infrared camera can detect the infrared radiation emitted by the high temperature of bodies, which it convert into an electronic signal. We intend to use thermal imaging to diagnose a particle accelerator for medical use. This technique can track its operating status and detect any breakdowns and failures. The accelerator is used in the Regional Cancer Centre in Oujda (CRO) to treat patients with tumor. The CRO assumes a vital role in the medical area of the eastern of morocco, which knows a large number of patients. So it is essential to ensure a diagnosis upstream by better managing and planning the therapeutic sessions. The work includes the production of a thermal mapping of the accelerator during normal operation and when a failure occurs.

The analysis begins with the manual segmentation of thermal images to isolate different significant regions. After which, we determined the temperature of all the elements present in areas of interest. Finally, we conducted a comparison of the temperature of its components in the case of normal operation and in the case of failure. Thus, the analysis of the thermal mapping allowed us to identify the fault that was confirmed by the company providing maintenance. It permits also to detect the deterioration of its components and their mutual influence, allowing an appropriate decision and optimal planning of therapeutic sessions.

The ELEKTA accelerator used at CRO



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Biography

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Mr.Elkihel,Professor National School of Applied Sciences Oujda. He has 12 publications. he has scientific contributions in infrared thermography.

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Continuous Distillation Column Fault Diagnosis based on Stationary Wavelet Transform and Fuzzy C-Means

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Abstract

This work falls within the context of detection and diagnosis of operating faults of an industrial installation. Indeed, the installation in this study is a Methylcyclohexane continuous column from a mixture of toluene / methylcyclohexane in which the mass composition was defined to 23% of methylcyclohexane. The studied system, allows the separation of the more volatile component which is methylcyclohexane contained in the liquid mixture.

The originality of this work is the application of Fuzzy C-Means, as an unsupervised classification tool, combined to the stationary walvelet transform, on a database of 120 samples, which include two modes of operation of the distillation column: the normal mode (60 samples), and the abnormal mode. The latter is represented by the four most common dysfunctions of the distillation column. The first dysfunction is caused by increasing the feed rate to 100% of its capacity. The second dysfunction results from increasing the reflux ratio to 100% of its capacity. The third dysfunction is due to increasing the power of preheating to 90% of its capacity. The last dysfunction results from increasing the heating power to 100% of its capacity. These dysfunctions are represented by 15 samples each. After evaluating the approach based on the Stationary Walvelet Transform (SWT) and Fuzzy C-Means algorithm (FCM) on the database, the obtained classification rate was 74.17 % with a specificity (classification rate of the normal mode) reaching 100%. This study highlighted the ability of the proposed approach for the separation of the various proposed operating modes.

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Biography

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Plasmon-Induced Transparency in Waveguide-Coupled Long Range Surface Plasmon Resonance for Sensing Applications

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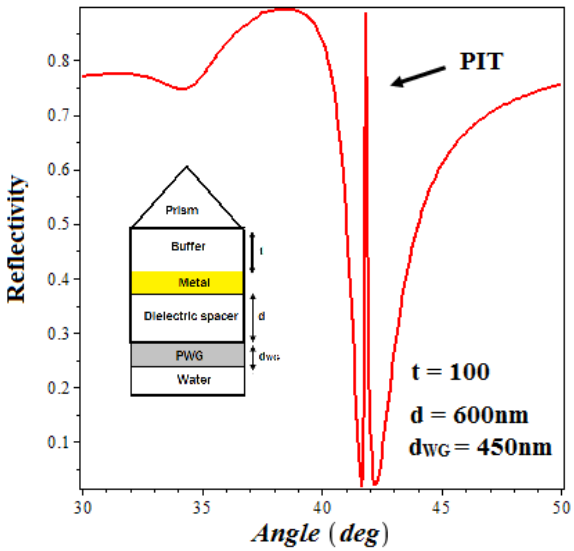
Abstract

In the last two decades, a remarkable progress has been made in the development of affinity biosensors with an expanding of their application in different areas such as food safety, medical diagnostics, and drug screening. A variety of optical methods have been used including interferometry, fluorescence spectroscopy, waveguide spectroscopy, and surface plasmon resonance (SPR) spectroscopy. Optical biosensors based on surface plasmon resonance have been extensively investigated, due to their higher sensitivity, and have become a central tool for characterizing and quantifying biomolecular interactions.

In this paper, we present a detailed study of a novel planar multilayer structure that allows coupling between waveguide modes (WGM) and surface plasmons resonance. The geometrical parameters of the structure are optimized to yield efficient coupling. The obtained results show a very sharp resonances in the reflectivity curve due to plasmon induced transparency(PID) phenomena. Electric field profiles obtained at the resonances angle demonstrate the hybrid nature of the modes excited. The sensitivity of the biosensor is enhanced by three orders of magnitude relative to that of conventional surface plasmon resonance biosensors.



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Biography

I received my PhD degree in physics in 2013 from Mohamed V University in collaboration with Moroccan Foundation of Advanced Science, Research and Innovation (MAScIR), Rabat. My research interests focus on modelisation and fabrication of biosensors based surface plasmon resonance.

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Studying of Radon Gas Concentrations in soil Qaa Al-Hakel agricultural area, Ibb, Yemen

Murad Al Mugahed, Farida Bentayeb

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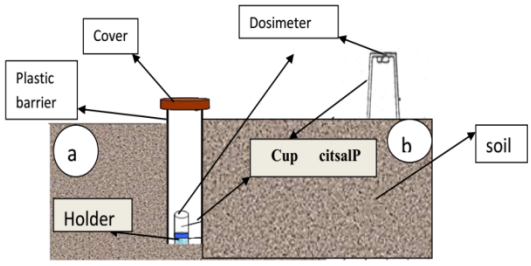
Abstract

The study has addressed the concentration of radon gas (^{222}Rn) in the soil by the sealed-can technique based on CR-39 nuclear track detectors(NTDs), during spring. The study area was divided into two parts: the first area A and the second area B .The study shows that the rate of radon gas concentration in the soil at a depth of 50 cm in the east and west of the area A is 3.026 KBq/m^3. While the average concentration of radon in the soil at a depth of 50 cm in the north and south of the area B is 5.582 KBq/m^3.The average concentration of radon gas on the surface of soil in area A is 0.915 KBq/m^3.The results show that the concentration of radon gas increases with depth in both areas (A, B). In the area A the concentration of radon increased from 0.78 to 13.56 starting from a depth of 10 cm to a depth of 150 cm respectively . As well as the area B, the concentration of radon increased from 3.12 KBq/m^3 to 11.91 KBq/m^{3}starting from a depth of 10 cm to a depth of 80 cm respectively. The averages concentration of radon gas in all types of study is considered as ordinary and are insufficient so they do not make a threat to human health.



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- Master degree (M. Sc.) in Nuclear Physics– Aden University –Aden–Yemen- 2011
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Simulation of the dose calculation and distribution in radiation Therapy Treatment Planning System

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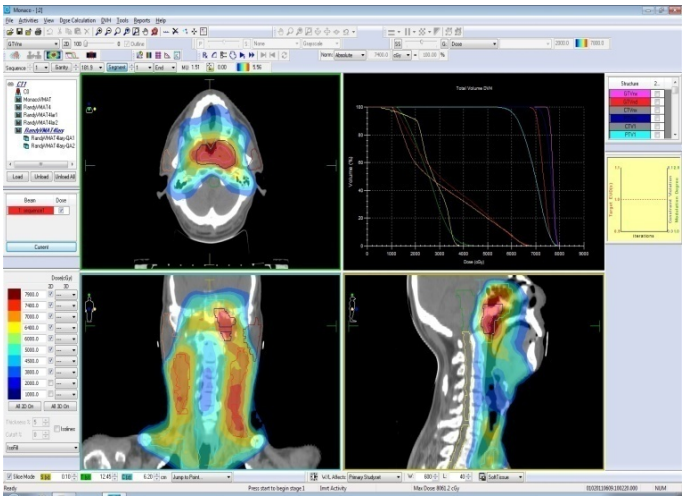
[2] University Mohammed first, Faculty of sciences, PFT2M, National School of Applied Sciences of Oujda.

Abstract

Radiation therapy is a method that uses high-energy particles to destroy cancer cells and stop their growing and at the same time preserve the healthy tissues around the tumor. This modality of cancer treatment needs several steps to be finally applied to a patient. One of the most important step is dosimetry which is the task of the medical physicist, in this step a whole simulation of the dose distribution is done, the movement of the Multileaf Collimator (MLC) and the gantry are also taken into account . A treatment planning includes algorithms which are based on physical principles such as Monte Carlo algorithms, those ones take into account physical phenomena, which make them the most accurate, but the disadvantage of Monte Carlo methods is that they need a very long time to perform the calculation, however time is a very important factor in radiotherapy because treatment must be simulated and applied as soon as possible. For this reason some algorithms are applied to accelerate the calculation. Accurate calculation of dose distribution in an non homogeneous medium such as human body is not an evident task, it needs a real precision especially when the tumor is localized in an organ which presents variable densities such as lung. For this reason, The simulation plays a crucial role in the therapeutic process in radiotherapy.

The main of this study is to show the role of algorithms of calculation of dose on the radiation therapy by applying them to some clinical cases. Thus we will be mainly interested in dose calculation algorithms especially the superposition-convolution algorithms that are implemented in Xio TPS.



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Biography

Lead authors work on the medical physics topic for several years. Two of them started their job at Oujda oncological center where they have *learned a great deal* about radiotherapy. Authors aim to improve treatment planning system precision by using Monte carlo simulation method.

Mr. Rrhioua and Mrs. Bakari have received their PhD in 2002 while Mr. Zerfaoui has obtained his Ph.D in 2001 from the University of Mohammed First, Oujda, Morocco. they published more than 15 papers. Mr. Machichi and Mr. Oulhouk are Ph.D students at Oujda University..

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Comparison of two calculation algorithms to evaluate the dosimetric effects of thermoplastic masks used in radiotherapy

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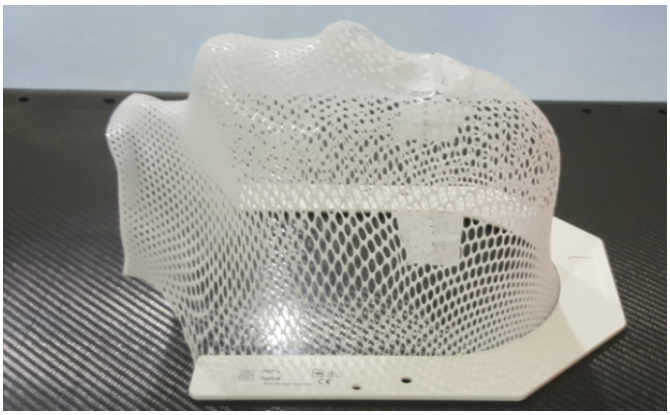
Abstract

In *radiation therapy*, the accuracy of dose calculation is extremely important for planning quality and treatment implementation. This is achieved through *Treatment Planning Systems* (TPS) that use different *algorithms* to calculate the *dose* for specific conditions. It should be noted that dose calculation algorithms are the most crucial software component in a TPS. These modules are intended to simulate particles transport, from the accelerator head to the energy deposit (*dose*) in the patient, using the physical processes of particle interactions with the material. Nevertheless, in radiotherapy, cancer treatment, especially, brain and *head and neck* sites, require a high precision positioning of the patient reproducible throughout the entire treatment course. Thus, during fractionated radiotherapy, to immobilize the patient's *head and neck*, and avoid patient movement errors, an immobilization device is used, it is known as a thermoplastic mask.

However, many studies have shown that *treatment planning systems* overestimate the *dose* delivered to the skin during treatment, so this type of mask could increase the surface *dose* absorbed by the patient.

The aim of the present study is to quantify and investigate the *dosimetric* effects caused by thermoplastic masks used in order to retain and reproduce a patient's position during radiation therapy by using two different *algorithms,* the superposition and fast superposition one.



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Biography

Lead authors work on the medical physics topic for several years. Two of them started their job at Oujda oncological center where they have *learned a great deal* about radiotherapy. Authors aim to improve treatment planning system precision by using Monte carlo simulation method.

Mr. Rrhioua and Mrs. Bakari have received their PhD in 2002 while Mr. Zerfaoui has obtained his Ph.D in 2001 from the University of Mohammed First, Oujda, Morocco. they published more than 15 papers. Mr berhil is a physician, Hassan II oncology center. Mr. Oulhouq and Mr. Machichi are Ph.D students at Oujda University.

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The use of non destructive technique of infrared thermography to dignose the rotating motors and the impact on the kinematic chain

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Abstract

In this paper, we describe an experimental device, based on an infrared thermography technic, which allows observing thermal phenomena. The three-phase asynchronous motor used in this workis mounted on a base plate with an alignment device. It has an operating frequency of 50Hz, two poles and a useful power of 0,55 kW. Its rotation speed is controlled by a frequency converter. The load is a magnetic powder brake. It is used to control the load torque, applied to the asynchronous machine. The stator current and the machine voltages of the induction machine are measured through voltage and current probes and recorded by an energy analyzer. The output indicators at the end of the chain are used to get the rotation speed, the torque, and the absorbed power. During the start-up transients, from standstill to steady state, thermal images of the motor trunk are captured every second, by an infrared camera connected to a computer equipped with analysis software. These images are used, in a first step, to build the thermal model of the induction motor. Then, the results obtained by the building model are compared with those obtained by the faulty machines, in order to study the applicability of thermographic data for diagnostic purposes.

Results show that this method represents a powerful diagnostic tool, which can be used to complete the information provided by techniques based on other quantities, in cases where they are inconclusive.

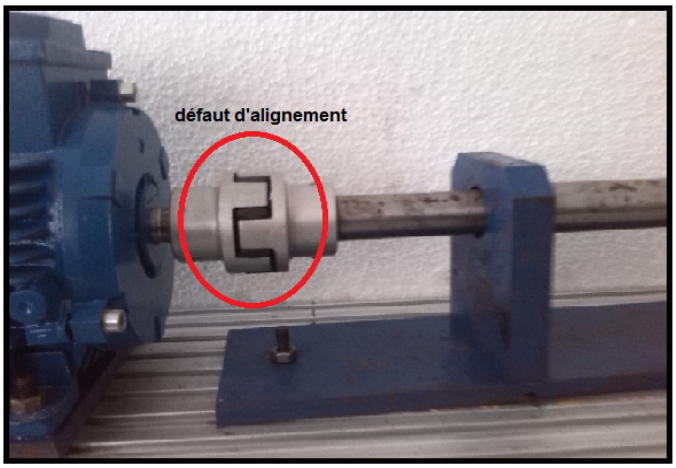

Figure. Misalignment 3-phase asynchronous motor

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New Approach Protocol Minimized Energy Consumption for Wireless Sensor Networks

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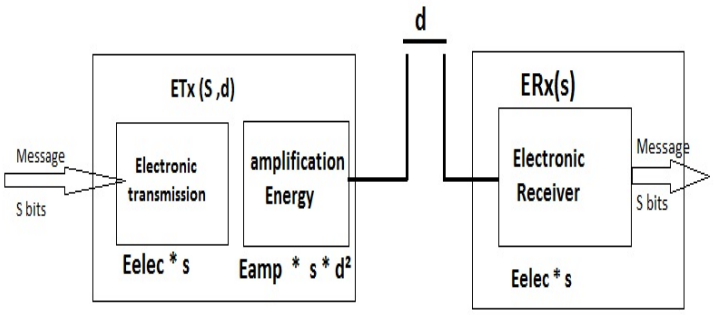
Abstract

In Wireless Sensor networks (WSN) the important constraint is the energy consumption by each node that influence the lifetime of a network, because the nodes in WSNs are usually powered by batteries with finite capacity and it is always impossible to replenish the power. To solve this problem, it is necessary to choose routing protocols that consume less energy and increase the life time of WSN. The aim of this paper is to evaluate the performance of the existing hierarchical routing protocol LEACH (Low-Energy Adaptive Clustering Hierarchy) and PEGASIS (Power-Efficient Gathering in Sensor Information System) in terms of energy consumption by each node in sensor network ,and detailed our new approach protocol based on Hierarchical routing Protocols LEACH and PEGASIS, and finally compare the results simulation of our methods using Matlab with the existing methods (LEACH ,PEGASIS).



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Biography

Hassan Oudani received his Master's degree in Network and system from the Faculty of Sciences, University Ibno Zohr Agadir, Morroco, in 2009. He is currently a PhD student in Polydisciplinary Faculty of Ouarzazate , Ibn Zohr University Agadir ,Morroco. Network administrator in the Urbain Agency of Ouarzazate-Zagora, Morroco. His research interests include wireless sensor Networks Design and implementation of a security protocol suitable for wireless sensor network at the polydisciplinary Faculty of ouarzazate,Ibn Zohr university, Agadir, Morocco.

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Application of the experimental design methodology using the microwave irradiation technique on the synthesis of stable silver nanoparticles encapsulated within the latex copolymer: optical and structural characterizations

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Abstract

In this work, the synthesis of silver metallic nanoparticles (Ag) is carried out by a simple, efficient and rapid method based on the reduction of the silver nitrate salt ($AgNO_3$) in an organic medium (ethanol) under microwave irradiation (MW) heating in a single step for only a few seconds in the presence of an aqueous emulsion of latex copolymer. The experiments were carried out either by varying the experimental parameters one after the other (classical approach) and by using the experimental design methodology which consists in simultaneously varying these experimental conditions in order to both optimize and evaluate their impact on the physicochemical properties of the nanoparticles. The main goal is to prepare a maximum concentration of silver nanoparticles with a minimum content of latex copolymer and $AgNO_3$.
We examined the dependence of the optical and morphological properties of silver nanoparticles with the controlled experimental parameters by using various instrumental methods such as the UV-Vis spectrophotometer, transmission electron microscopy (TEM), scanning electron microscopy (SEM), dynamic light scattering (DLS), Fourier transform infrared spectroscopy (FTIR) and Raman spectroscopy. The prepared nanoparticles were found to be extremely stable in colloidal solution with very narrow size distributions confirming the high quality and the uniform diameter of the nanoparticles obtained by the microwave synthesis approach. This could possibly be due to the stabilizing effect produced by the latex molecules, which is a good environment for effectively controlling the growth of silver nanoparticles.

Keywords: Noble metals; Silver metallic nanoparticles; Microwave irradiation; Aqueous emulsion of latex copolymer; Localized surface plasmon resonance (LSPR); Experimental design.

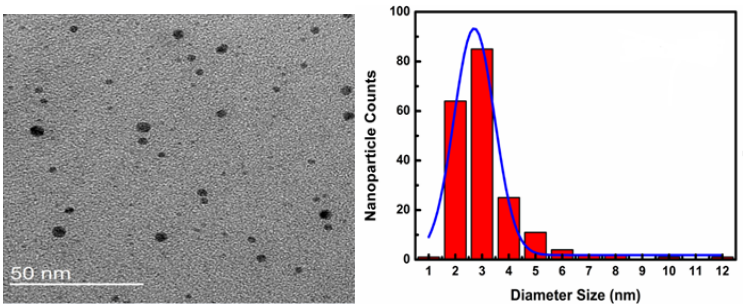

Figure: *TEM image along with its corresponding size distribution histogram of silver nanoparticles-latex copolymer nanocomposites, prepared using the microwave-assisted polyol synthesis procedure.*

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Biography

I'm Mina IDER. I was warded my PhD in July 2017 in the framework of international Cotutelle program between the Hassan II University of Casablanca (Morocco) and the University of Le Mans in France. I published Five international research items (including original research papers and patent). I was the Laureate of Excellence Eiffel scholarship of the French Government during the year 2014-2015 and also the laureate of Excellence Scholarship from the National Center for Scientific and Technical Research (CNRST) of Rabat (Morocco) during the period of 2013-2016. My focus is mainly based on the microwave energy synthesis and characterization of noble metal nanoparticles encapsulated in the latex-based copolymer matrix to have applications in photocatalysis and even in biology (antibacterial activities) related to the surface plasmonic effects (localized surface plasmon resonance-LSPR).

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New carbazole-stilbene copolymer: synthesis, structural and photo-physical properties of films and nanowires elaboration

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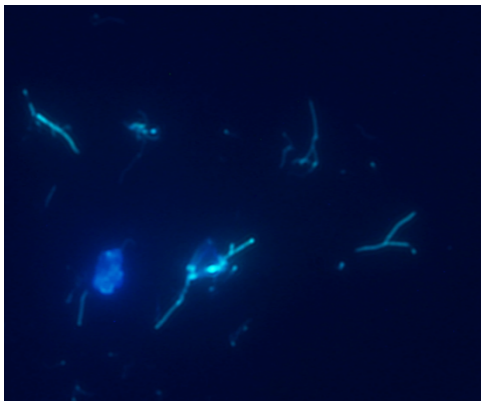
Abstract

With regard to the problem of insolubility of PVK-PPV copolymer [1-4], a novel diblock copolymer based on carbazole CZ and the oligomer of PPV (trans-stilbene) in the hope to obtain a soluble copolymer with original photophysical properties. Therefore, we have synthesized a new conjugated copolymer, CZ-stilbene, which exhibits solubility in chlorobenzene. For that, films and nanowires of CZ-stilbene copolymer were also synthesized. The grafting of stilbene with carbazole moieties was elucidated by infrared absorption, Raman spectroscopy. A structural and morphological study of the films and NWRs of result copolymer by scanning and transmission electron microscopy reveal a multiscale one-dimensional self-organization of NWRs and a globular form at the molecular and at the sub-micrometric level of film. The resulting copolymer it exhibits original optical properties compared to the carbazole and stilbene ones.

Carbazole-stilbene nanowires



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Biography

During my PhD, I have studied and performed the synthesis of new copolymers derived from PVK and PPV polymer and functional assemblies of this copolymers and carbon nanotubes (carbon nanoperles), in other hand I have synthesis a nanowires of conjugated polymers using AAO membrane

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Voltage adjustment for Medium Electrical Distribution Networks Including renewable energies sources

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Abstract

Morocco, a low emitting Greenhouse Gasescountry but vulnerable to the effects of climate change, took its responsibilities very early by imposing concrete measures in favor of the climate. He has long been involved in sustainable development with dam policy for more than half a century to meet his needs in agriculture and electricity.

It is in this sense that it is committed to reducing its GHG emissions by 32% by 2030. This commitment is based on the large-scale development of renewable energies and the reinforcement of energy efficiency.

To deal with the issue of renewable energy intermittences, Morocco was one of the first countries in the Euro-Mediterranean region to introduce Pumped hydro energy storage with a capacity of 460 MW. For energy efficiency, it is one of the important pillars of our energy strategy. A series of actions have been implemented and have allowed a gain in power, mainly reactive energy compensationthrough the installation of capacitor bank.

The integration of decentralized renewable energy production can reverse the direction of power flow and send power to the transmission grid. A strong penetration of this resource on a weak network can generate overvoltage at the end of distribution line, and thus require a revision of the regulation of tension and the protection of the network.

The increase in renewable energy production, which is highly variable and geographically dispersed, requires a new grid voltage plan that will allow conversion to the energy mix.

This article presents a vision of voltage regulation on the distribution grid as well as the problem caused by the arrival of decentralized productions DEPon the electricity grid.

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Biography

MohamedDIB is a PhD student at the FST (Faculté sciences et techniques) of Beni Mellal, Morocco. Hers research interests include renewable energy and reactive energy compensation

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Plasmonic induced transparency in graphene-based side coupled cavities system

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Abstract

Electromagnetically induced transparency (EIT) is a quantum phenomenon that takes place in atomic systems due to destructive (quantum) interference between two excitation pathways to an upper atomic level [1]. As a result, the atomic medium previously opaque is rendered transparent within a narrow spectral region with low absorption and steep dispersion. These properties have been employed to demonstrate various applications within atomic systems such as: slow light, sensing and data storage [1], [2]. Interestingly, it was found out that classical systems could also exhibit EIT-like behaviors [2], and subsequently several structures were proposed for the purpose of showing the classical analogue of EIT. We can cite for instance: plasmonic structures [3], planar metamaterials [4], microbubble whispering-gallery mode resonators [5] and radio-frequency mono-mode circuits.

In this communication, we propose a compact graphene-based waveguide nanostructure, which can support the classical analogue of EIT. The main graphene waveguide is coupled to two ribbons (made out of graphene) situated either on the same side, giving rise to the so-called Λ-type configuration [1], [2] or connected symmetrically to the main waveguide, giving rise to the classical analogue of the V-type configuration. Figure 1, shows a sketch of the system design in V-like state. The main (graphene) bus waveguide along with the two-ribbons is embedded in a dielectric material whose relative permittivity is ε=2.25. Graphene is modeled as a thin anisotropic material with a thickness of 1 nm. One of the remarkable properties of graphene is the possibility of dynamically tuning its conductivity by changing the Fermi energy level. In practice, this is simply achieved by applying a gate-voltage on the graphene sheets. Following this assumption, we demonstrate numerically the possibility of realizing a (dynamically) tunable EIT-like effect in the THz frequency range by shifting the energy levels of the graphene ribbons.

Figure 2, presents an example of the transmission spectrum of the structure in the case where the nano-ribbons are symmetrically placed on each side of the main waveguide. Each ribbon is 200 nm apart from the bus waveguide and both of them are 250 nm long. The figure clearly indicates the emergence of a transparency window corresponding to EIT resonance around 10.65 THz and two transmission minima induced by the two ribbons. We also show that one can adjust the resonance frequency by appropriately detuning the Fermi levels of the two graphene ribbons.

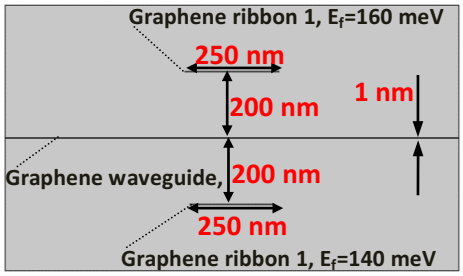

Figure 1: Geometry of a graphene-based waveguide structure coupled to two graphene nano-ribbons symmetrically placed aside of the bus waveguide. The ribbons have the same length, 250 nm, and are 200 nm apart from the waveguide; their Fermi energy levels are 140 meV (lower one) and 160 meV (upper one). The bus waveguide Fermi energy level is 140 meV.

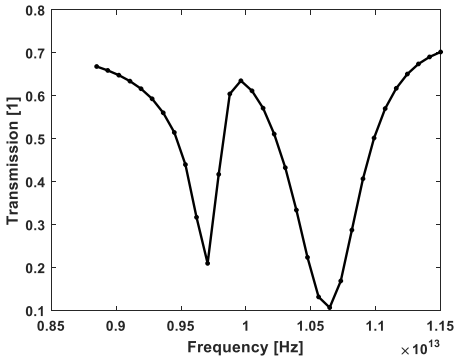

Figure 2: Transmission spectrum of the geometry depicted in Fig. 1 versus the frequency.

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Biography

The Author has an expertise in modeling and simulating (numerically) nano-photonic structures for the control of light propagation at the nano-scale domain such as graphene-based materials. He was awarded his PhD in 2010 from the University of Lille 1 (France). The author published more than 16 papers.

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Surface acoustic waves in one-dimensional piezoelectric-metallic phononic crystal: Effect of a cap layer

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Abstract

Surface acoustic waves associated to a free surface of a given material have received a great deal of attention since several decades ago [1]. The well known are Rayleigh [2] and Bleustein Gulyaev (BG) acoustic waves that propagate along the surface of a homogenous piezoelectric material and vanish inside its bulk. Rayleigh waves involving transverse and longitudinal modes have been used in filters [3], sensors [4], resonators [5] and heat transfer [6]. BG waves coupling shear horizontal (SH) waves to the electric potential have been used for liquid sensing applications [7] because they do not radiate energy into the contacting liquid and are sensitive to changes in the liquid density and viscous coefficient. Also BG surface waves have been used to transmit phonons between two contactless piezoelectric media [8].

In this work, we give an analytical and a numerical study about the possibility to engineer surface modes that could be supported by a piezoelectric cap layer deposited at the surface of a semi-infinite piezoelectric/metallic superlattice (SL). In particular, i) we give closed form expressions of the dispersion relations of surface modes induced by the cap layer depending on whether the surface is metallized or not metallized. ii) We generalize a rule about the existence of surface modes when considering two complementary semi-infinite SLs obtained by the cleavage of an infinite SL along a plane parallel to the piezoelectric layers, namely when the cap layers are not metallized, one obtains one surface mode per gap, this mode is associated with one of the two complementary SLs. However, when the cap layers are metallized, this rule is not fulfilled and one can obtain zero, one or two modes inside each gap of the two complementary SLs depending on the position of the plane where the cleavage is produced. iii) We show that in addition to the BG surface waves localized at the surface of the cap layer, there may exist true guided waves and pseudo-guided waves (i.e. leaky waves) induced by the cap layer either inside the gaps or inside the bands of the SL respectively. It is worth mentioning that the guided modes of the cap layer become pseudo-guided (or leaky) modes when the latter is deposited on a homogeneous substrate, especially for high frequency modes or when the velocity of sound in the cap layer is higher than that of the substrate. However, when the cap is adsorbed on a SL, instead of a substrate, the modes lying inside the gaps become true guided modes. Indeed, in this case the SL plays the rule of a barrier for these phonons. This structure offers a facility to observe easily from the experimental point of view, the high frequency guided modes of the cap layer. Also, we show the possibility of existence of interface modes between the SL and a cap layer as well as an interaction between these modes and a BG surface mode when both modes fall in the band gaps of the SL. The strength of the interaction depends on the width of the cap layer. iv) We show that the electromechanical coupling coefficient (ECC) is very sensitive to the cap layer thickness, especially we give a necessary condition for the existence of the ECC, namely, the thickness dp0 of the surface layer must be chosen such that dp0 > 0,5 dp, where dp is the thickness of the piezoelectric layers within the SL. The effect of the nature of the metallic layers constituting the SL on the ECC is also investigated. The closed form expressions of the dispersion relations of bulk and surface modes are obtained by means of the Green's function method. This method enables also to determine the local and total densities of states where the guided and pseudo-guided modes appear as well defined peaks.

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Magnonicdemultiplexer based on electromagnetic induced transparency

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Abstract

Recently, the existence of the analogue of electromagnetic induced transparency EIT and Fano resonances in classical linear systems has attracted a great attention [1-4]. In this context, we have shown theoretically the possibility of existence of these two types of resonances [5,6] in simple photonic circuits composed of a waveguide with two grafted stubs on the same site or at two different sites. These resonances are obtained by detuning the lengths of the two stubs of lengths d_1 and d_2 (i.e., $\delta = d_2 - d_1$). Indeed, the two stubs give rise to two transmission zeros falling at two neighbouring frequencies f_1 and f_2. Therefore, it exists automatically a frequency f_3 lying between f_1 and f_2 for which the transmission reaches unity. This resonance, squeezed between two transmission zeros, is induced by the two stubs taken together [6] or by the segment between the resonators [5]. Similar results have been performed using Helmholtz resonators in the acoustic domain [4].

In this work, we give an extension of the previous works [4-6] to the magnonic domain and show the possibility to realise a simple magneticdemultiplexer (Fig.1) based on EIT and Fano resonances. The demultiplexer is composed of a Y-shape waveguide with an input line and two output lines. Each line contains two grafted resonators in a given position or in two different positions away from the input line. The necessary conditions for realizing selective transfer of a single frequency through one line while keeping the other line unaffected are deduced. To our knowledge, these two designs have not been proposed before to perform demultiplexing in the magnonic domain. The theoretical results are obtained using the Green's function method.

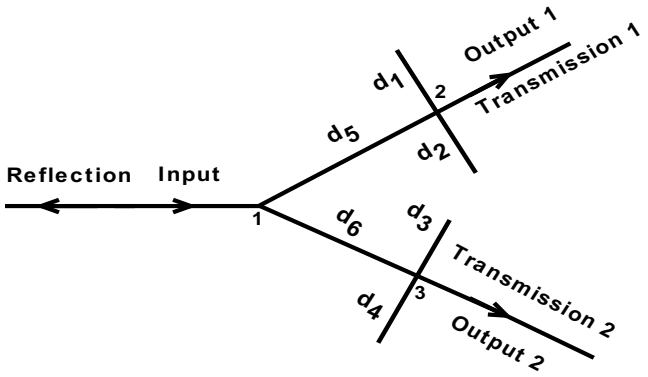

Fig.1: Schema of a demultiplexer in the Y-shap with one input line and two outputlines.

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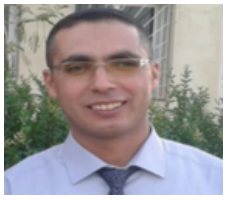
Biography



Abdelkader Mouadili, assistant professor at the Faculty of Science and Technology of Mohammedia, solid physical specialty, research axes the propagation of electromagnetic waves in one-dimensional waveguides and photoluminescence spectroscopy. Warded his PhD in 2016 from the University Mohammed I, Oujda, Morocco.

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New electrical model of supercapacitors for electric vehicle applications

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Abstract

With the request to reduce gas emissions and minimize using fossil fuel, the most vehicles companies are deciding to produce clean cars like electric and hybrid vehicles, which need an important electrical power, since so many electronic features are used in order to improve the vehicle performance,this power is conditioned by the electrical energy storage system such as batteries and supercapacitors.

Supercapacitors (ultracapacitors) called also double layer capacitors are considered as an electrochemical component with high-power density and an intermediate energy density between batteries and conventional capacitors. they are characterized by low series resistance, significant equivalent capacitance and long service life. Nowadays they become an attractive alternative storage device for several applications. They can be used in combination with other energy supplies like batteries.

In order to understand the electrical and energetic behaviour of ultracapacitor, several electric models of supercapacitors, which characterize their real behaviour, have been proposed.

The purpose of this paper is to propose a new electrical model of supercapacitors in order to present their static and dynamic behaviour

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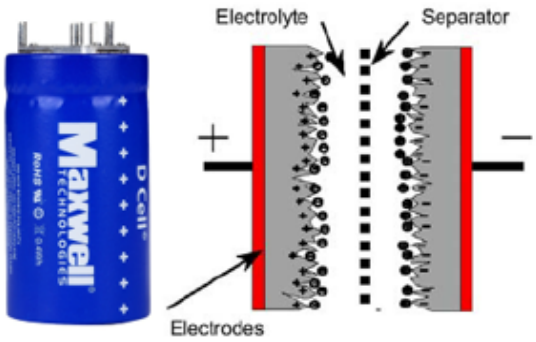

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Biography

Zoubida Bououchma was born in Morocco in 1992. She got the Engineering degree in Electromechanical Engineering from the Ecole Nationale Supérieured'Arts & Métiers "ENSAM", Meknès, in 2015. She is currently pursuing Ph.D. degree in electrical engineering in ENSAM, Moulay Ismail university, Morocco.

Her research focuses on energy storage device, more specifically, supercapacitors and Lithium-ion batteries, modelling diagnosis and aging estimation.

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$Ba_{1-x}La_xTi_1$-$_xFe_xO_3$ (0≤x≤1) Perovskite-type materials for solid oxide fuel cell cathodes: Crystal structure, optical and electronic conductivity investigations

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Abstract

To the present day perovskites remain as one of the most widely examined classes of compounds in solid-state inorganic chemistry[1, 2]. The ideal perovskite oxide has an ABO_3 cubic form that adoptsthe space group $Pm\bar{3}m$ (No. 221). Structural variations in this family of compounds are based on chemical substitutions of cations in the A and/or B sites, or variations in the oxygen content [3, 4]. Due to their many advantageous perovskite oxides are considered as promising materials for use as solid oxide fuel cell cathodes and anodes. The most relevant of these compounds are their high electronic conductivities and catalytic activity towards oxygen reduction[5].

Through a conventional solid-state reaction new series of $Ba_{1-x}La_xTi_{1-x}Fe_xO_3$ perovskite were successfully synthesized and characterized by X-ray diffraction, UV-vis and electrochemical impedance spectroscopy. In order to find a correlation between the physical properties and the crystallographic structure, we discuss in this work the phase transition induced by the substitution in A-sites and B-site (**Fig.1**), as well as the conductivity behavior of the corresponding samples $BaTiO_3$; $Ba_{0.75}La_{0.25}Ti_{0.75}Fe_{0.25}O_3$; $Ba_{0.5}La_{0.5}Ti_{0.5}Fe_{0.5}O_3$; $Ba_{0.25}La_{0.75}Ti_{0.25}Fe_{0.75}O_3$ and$LaFeO_3$.

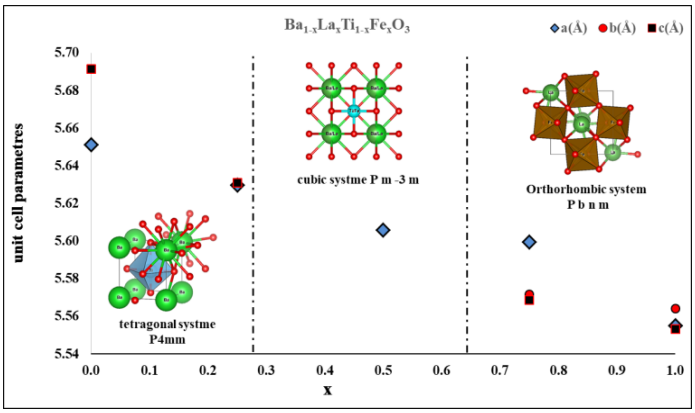

Fig.1. Unit cell parameters evolution as function of La^{3+} and Fe^{3+} amount in the series $Ba_{1-x}La_xTi_{1-x}Fe_xO_3$ (0≤x≤1)

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Biography

Ms.Fatima El Bachraoui, first year PhD student at Materials Sciences and Nano-Engineering department, Mohammed VI Polytechnic University and Univ Hassan 1er, Laboratoire des Sciences des Matériaux, des Milieux et de la modélisation(LS3M), 25000, Khouribgasince 2017. She received a bachelor degree in Electronics in 2013 from faculty of sciences, Mohammed first University – Oujda, a professional qualification license for teaching in 2014 from ENS-Rabat and her Master's Degree in advanced materials from Faculty of Sciences and Technology, Cadi Ayyad University – Marrakesh, Morocco. Her doctoral studies are focused on the Design of Energy Conversion Material for Solid Oxide Fuel Cells Based on Perovskites.

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Bound states in the continuum in one dimensionalphononic crystal

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Abstract

Bound states in the continuum (BIC) are waves that remain localized even though they coexist with a continuous spectrum of radiating waves that can carry energy away. Their existence was first proposed in quantum mechanics [1] and, they identified later in electromagnetic [2], acoustic [3], and water waves [4]. They have been studied in a wide variety of material systems such asphotonic crystals, optical waveguides and fibers, piezoelectric materials, quantum dots, graphene, etc.
In this work we demonstrate theoretically and numerically the possibility of existence of BIC states in two structures:
i) a system made of a single solid layer inserted between two semi-infinite fluids. Weshow the possibilityof existence of trapped modes, which are discrete modes of the solid layer that lie in thecontinuum modes of the surrounding fluids. Figure 1 shows the transmission coefficient of a plexiglas layer of thickness d_s emerged in water versus the dimensionless frequency $\Omega = \omega d_s/v_0$ where v_0 is the velocity of sound in water. The black dashed line represents the Fano like resonance around $\Omega = 6.5$ for θ=33.2°, whereas the red line shows the collapse(hidden) of such resonance for θ=33.49°giving rise to a zero width resonanceor BIC state.

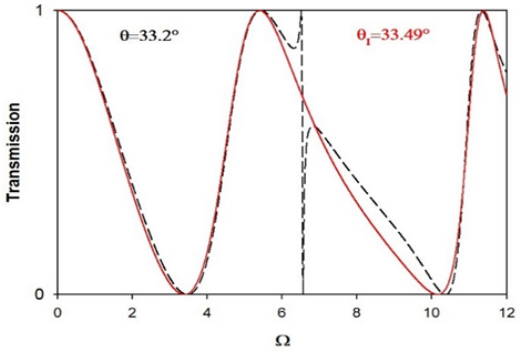

Figure 1: Variation of the transmission coefficientversus thedimensionless frequency $\Omega = \omega d_s/v_0$. The black dashed curve represents the Fano resonance for an incidence angle θ=33.2°, whereas the red curve indicates the trapped mode for $\theta_I = 33.49°$.

ii) a structure made of a plexiglas-water-plexiglas triple-layer embedded in water.The thicknesses of the layers are supposed the same, namely $d_{s1}=d_{s2}= d_f$.By slightly detuning the angle of incidenceθ_0=32.6° from that associated to the trapped mode (red curve in Fig. 2), we get a well defined Fano resonance characterized by an asymmetric Fano profile in the transmission spectra. Also, this structure mayexhibit a resonance squeezed between two transmission zeros induced by the two solid layers. This is obtained byan appropriate choice of the incidence angle (Fig.3). This resonancebehaves like an acoustic induced transparency (AIT) resonance,its position and width depend on the nature of the fluid andsolid layers as well as on the difference between the thicknesses d_{s1} and $d_{s2}$of the solid layers.

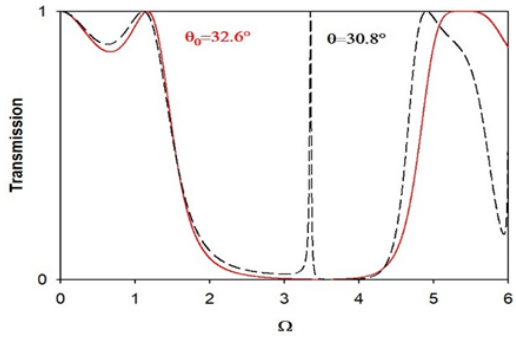

Figure2: Transmission coefficient versus the dimensionless frequency Ω. The black dashed curvegives the Fano resonance around $\Omega = 3.4$ for an angle of incidence θ=30.8°, whereas the red curve exhibits the hidden mode (called BIC) for$\theta_0 = 33.49°$.

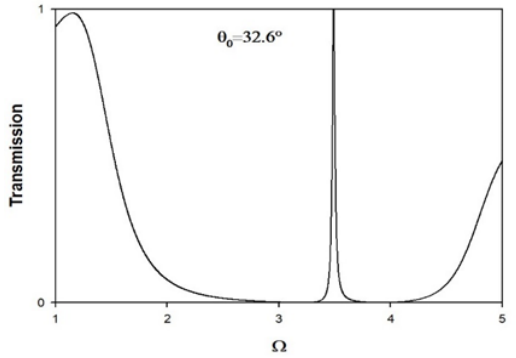

Figure 3: Transmission coefficient versus the dimensionless frequency Ωfor a triple-layer characterized by the thicknesses $d_{s1} = 1.1d_f$and $d_{s2} = 0.9d_f$ and θ=32.6°.

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Thermal behavior of an alveolar structure submitted to a sinusoidal excitation

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Abstract

The aim of the present work is to study numerically, in a transient state, the thermal behavior of an alveolar structure submitted to a sinusoidal excitation. The coupled heat transfer by conduction in the surrounding solid partitions, natural convection and surface radiation are taken account. The outside vertical surface of the structure is submitted to a sinusoidal thermal excitation, while the inside vertical surface is maintained at a constant temperature. The top and bottom horizontal sides are assumed to be adiabatic. The governing equations for conservation of mass, momentum and energy are discretized by the finite volume approach and solved by the SIMPLE algorithm. The main parameters governing the problem are the amplitude and the period of the exciting temperature and the emissivity of the internal surfaces. The effect of the sinusoidal thermal excitation on the global heat transfer through the structure is presented and examined.

Posters

Local development of Enzyme-linked Immuno-Sorbent Assay for two carbamates pesticides: carbendazim and carbofuran

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Abstract

Pesticides are defined as any substance or mixture of substances intended for preventing, destroying, repelling or mitigating any pest [1]. They are used to protect agriculture and horticultural corps against damage and also used as domestic insecticides [2]. Excessive use of pesticides affects human's health, animals and environment. They have many different modes of action, but in general cause biochemical changes which interfere with normal cell functions. In Morocco,organophosphorus,organochlorine and carbamates were the most frequent cause of fatal pesticides poisoning [3].

Carbamates insecticides used increasingly in agriculture as a replacement for environmentally more persistent organo-chlorine insecticides for the control of insect pests.It was the most used pesticides in Loukkous-Morocco (28 et 21 %) [4].

Conventional methods employed to detect/analyze carbamates residues are time consuming and require sophisticated equipment only available in well-equipped laboratories. In addition, the conventional methods usually require a lot of complex pre-treatment of samples. Therefore, convenient and rapid pesticide detection system is urgently needed.

In this order, we aimed to develop a rapid Enzyme-linked Immuno-Sorbent Assay (ELISA)for detection of some carbamates such as Carbendazim[methyl 2-benzimidazole carbamate] and carbofuran[2,3-dihydro-2,2-dimethyl-7-benzofuranylmethyl carbamate].

Challenging step in pesticide immunoanalysis is the development of specific antibodies, since most pesticides are small molecules (haptens) that should be conjugated through a suitable active chemical group (COOH; -NH2, -OH, -SH, etc.) to a carrier protein in order to elicit an immune response.

To develop an immunoassay for carbendazim and carbofuran we have synthesized molecules with acid function (haptens with 4 and 5 carbons) that are coupled with BSA protein and injected to the rabbits, collected antibodies are used for the achievements of the immunoanalytical assay. The ELISA method exhibited the potential to develop kits for a rapid detection of carbendazim and carbofuran for human health and environmental safety.

Keywords: Pesticides,Carbamates,Carbendazim, Polyclonal antibodies, immunoassay, ELISA.

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The behavior of Poly (vinyl chloride) / Olive residue flour composites under Gamma irradiation

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Abstract

In this study, olive residue flour (ORF) were irradiated at doses of 10 and 70kGy and the composites of poly (vinyl chloride) (PVC)/ olive residue flour (ORF) were prepared in ratios of 20/80 (ORF wt%/PVC wt%). The thermal and mechanical properties of the composites were studied. The results indicate that, the treatment does not significantly affect the thermal properties of olive residue flour. According to the study of the wettability, an improvement of the hydrophobicity was observed for the composites loaded with the filler irradiated; this is confirmed by the decrease in energy of the polar component after the treatment, which leads to a better adhesion with the non-polar PVC. The morphological characterization of the composites treated has more homogeneous surfaces compared to the surfaces of the composites non irradiated and therefore better mechanical and thermal properties have been obtained.

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Biography

The main area of research is the recovery of renewable waste and its use as reinforcements in thermoplastic matrix composites. So, we interested to use of olive residue flour in poly (vinyl chloride) matrix composite and the use of gamma irradiation treatments to improve the compatibility between filler and matrix. I got my PhD in 2015 from the University A. Mira of Bejaia, Algeria.
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Study of vibrational and optical properties of annealed SiOxNy:H thin films

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Abstract

In recent years, increasing attention has been paid to silicon based dielectrics such as; silicon oxide, silicon nitride and silicon oxynitride as potential materials for the development of optoelectronics devices [1-5]. SiO_xN_y:H material has an important optical properties such as transparency that extends from the visible to near infrared and refractive index adjusted to a wide range (n=1.45 -2.0). A variety of deposition techniques has been employed to steer the nitrogen and oxygen concentration in the films composition. In this work, we investigate the effect of thermal annealing on the vibrational and optical properties of SiO_xN_y:H films.These films are deposited by PECVD technique at 200°C for 5 min from mixture of SiH_4, N_2O, NH_3 and N_2. Subsequently, the films were annealed at various temperatures ranging from 400°C to 1000°C for 30 min then characterized by infrared spectroscopy (FTIR) and spectrosconic ellipsometry (SE). The infrared spectra show a broad absorption band (Si-O (S) stretching vibration mode) (Figure 1). As the annealing temperature increases, we observe the emergence of a new peak at around 820 cm^{-1} attributed to Si-O bending mode [3-5]. Using the Maxwell Garnett theory, the film is considered as heterogeneous ternary compound (Si_3N_4, SiO_2, and H_2). The SE analysis showed that the film thickness and the H_2 volume fraction decrease progressively from 1163 to 1095 nm and from 1.5 to 0.85%, respectively as the annealing temperature increases. Finally, from these results, it is noted that the silicon oxynitride film has an important properties and can be used as waveguide material in integrated optics.

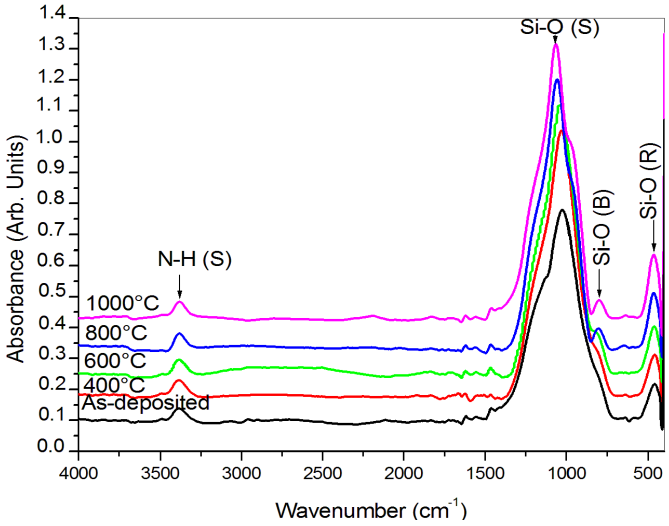

Figure 3: Figure illustrating the effect of thermal annealing on various chemical bonds presents in the hydrogenated silicon oxynitride films.

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Biography

Author has her expertise in elaboration and characterization of thin films usedin optoelectronics and microelectronics devices. Her focus is based on the use of SiO_xN_y:H to have application in health field. He was warded her PhD in 2013 from the University of Batna, Algeria. He published 3 papers. Her H-index is 1 on Scopus.

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Direct precipitation synthesis and characterization of Yb3+ / Er3+ doped Lanthanum orthophosphate LaPO4

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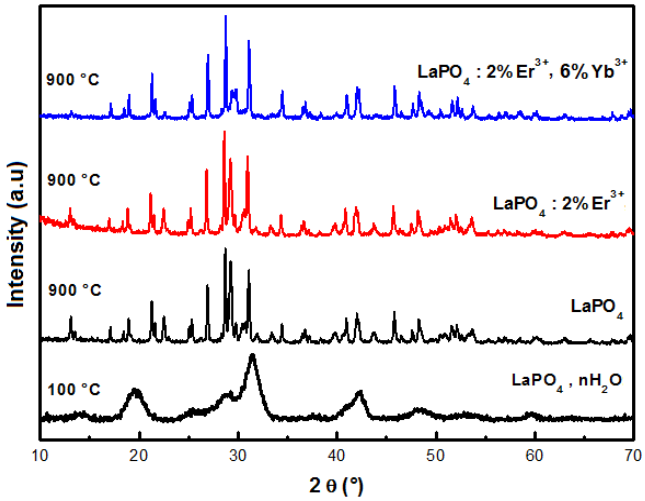
Abstract

The couples (Erbium , Ytterbium) codoped Lanthanum Orthophosphate $LaPO_4$ samples were synthesized with precipitation method in aqueous solution of Lanthanides ions using Lanthanum nitrate hexahydrate agent $La(NO_3)_3$ and Trisodium phosphate Na_3PO_4 as precursors. $LaPO_4$, $La_{0.98}Er_{0.02}PO_4$ and $La_{0.92}Er_{0.02}Yb_{0.06}PO_4$ were prepared and investigated.

$LaPO_4$ found its application in many fields especially in photonic conversion. The couples of rare earth Er^{3+}/Yb^{3+} is known as energy up converter due to the energy transfert (ETU) between ions.

The presences of different components were detected using XRF technique. FTIR-ATR spectra confirmed the existence of PO_4 bonds in our samples. Also, thermal behavior ATD-ATG is applied for specify phase temperature transition from Rhabdophane to Monazite structure at 825 °C. The XRD provided evidence Monazite structure belong monoclinic system for the calcined sample at 900 °C. Finally, UV-visible allowed observing the transmission areas of the powder.

Keywords: Lanthanum orthophosphate, co-precipitation synthesis, rare earth ions, photonic conversion.



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Biography

Aitmellal Oussama is a PhD student in the Materials Physics at University Sultan Moulay Slimane (USMS), Beni-Mellal, Morocco. He is also affiliated to the science unit of material (USM/DERS) at National Center for Energy, Sciences and Nuclear Techniques (CNESTEN), Rabat, Morocco. Before joining the doctoral studies he received a state engineer diploma at the Faculty of Sciences and Techniques (FST) Beni-Mellal in physical engineering of materials and energy, in addition to the Universty Degree of Technology in control of energy and renewable energies at University Ibn Zohr (UIZ) Agadir. His primarily researchs concerned the development and the study of functional materials with a potential application in energy: synthesis and characterization of rare earth orthophosphates. In his last end of study project, he has focused on photonic conversion in phosphors, transitions between the energy levels of rare earth ions, elaboration and characterization.

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FD-LBM simulations of double-diffusive Soret convection in a square cavity heated/cooled from above/below with internal heat generation

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Abstract

The literature review shows that thermosolutal convection under the combined effects of thermodiffusion and internal heat generation has not been studied in the past despite its presence in many practical problems. The present numerical study deals with natural convection induced in a square cavity heated/cooled from above/below with internal heat generation in the presence of Soret effect. A hybrid scheme with simple relaxation time lattice Boltzmann method (SRT-LBM) is used to obtain the velocity field while the temperature and concentration fields are deduced from energy and species balances using a finite difference method (FDM). The study focuses on the effect of three parameters, which are the Soret parameter ($Sr = -0.5$, 0 and 0.5), the buoyancy ratio ($N = -1$ and 1) and the internal to external Rayleigh numbers ratio ($0 \leq R \leq 80$). Combined effects of these parameters on fluid flow and heat and mass transfer characteristics are examined for Lewis number Le = 2, Prandtl number $Pr = 0.71$ and external Rayleigh number $Ra_E = 10^5$. The heat generation may stabilizes or destabilize the flow depending on its intensity and the signs of the soret parameter and the buoyancy ratio. There are situations where heat generation attenuates a chaotic regime and bring it back to a periodic one. The steady flow structure is multicellular with a pair of two or three cells (depending on the sign of N) superposed in the vertical direction.

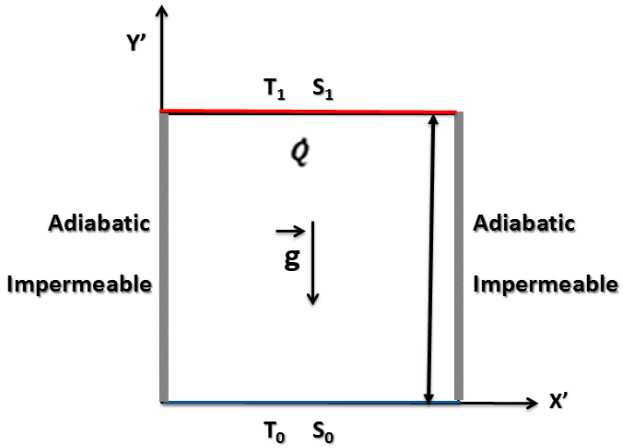

Fig.1 Physical model of the studied configuration.

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Biography

SafaeHasnaoui is a PHD student enrolled in Cadi Ayyad University, Marrakech (Morocco) and Picardie Jules Verne University, Amiens (France). She is currently investigating Heat and mass transfer on thermosolutal enclosure by using numerical simulation based on Lattice Boltzman Method.

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Industrial and ecological effect of a Bio-load on polymers

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Abstract

The development of more environmentally friendly materials has become a major concern for the industrial world and it meets a growing societal demand. Currently, the areas of research on these materials relate bio based materials, biodegradable materials and recycled materials.
The latest advances regarding the issues of materials of organic or inorganic, plant or animal origin or hybrids, have made a giant step in the development of "sustainable materials". It will be necessary to take into account the use of natural resources and renewable both at the level of matrices and loads (natural loads, plants) for composite applications focusing on physicochemical properties.
Based on these recommendations, we hope, through our research subject, to bring an improvement to this eco-composite by reinforcing their thermos-mechanical qualities by an animal origin load.
This improvement is highlighted following a characterization based on the elastic behavior analysis by tensile tests
Besides, we examined criteria of identification which allow to diagnose the usage of this material. To justify the relevance of this attempt, curves from the tensile tests on virgin material illustrate significant review results.
Obtained from waste with a significant recycling potential from renewable resources, the bio-load characterized mechanically is injected into polymer materials in order to promote the evolution of their thermo-mechanical properties, whether static or dynamic, resistance to corrosion, heat, wear ... They result in functional changes such as security, relief, coatings, stability ...

Keywords: Biodegradable materials, Recycled materials, Sustainable materials, Eco-composites, Bio-load, Thermo-mechanical properties.

Coupled heat transfer through an alveolar structure heated by a uniform heat flux

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Abstract

This work presents a numerical study of combined heat transfer through an alveolar structure. The hot surface is heated by an uniform flux while the cold surface is kept isothermal at a constant temperature. The horizontal faces are submitted to a periodicity condition. Natural convection, conduction heat transfer in the solid partitions and radiation exchange between gray and diffuse surfaces are taken into account. The governing equations for conservation of mass, momentum and energy are discretized by the finite volume approach and solved by the SIMPLE algorithm. The effects of the Rayleigh number, the thermal conductivity of the solid partitions and the surface emissivity on the overall heat transfer and the flow structures are presented and analyzed.

The Effects of Gamma Irradiation on PHBV/ Cloisite 30B Bionanocomposites

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Abstract

Today, biopolymers such as polyhydroxyalcanoates and their bionanocomposites are currently used in food packaging as well as in biomedical due to their biodegradability, and biocompatibility [1]. In such applications, biodegradable polymers have to be sterilized by ionizing radiations including gamma rays, e-beam, etc. prior to use in order to minimize the risk of bacterial contamination [2-3]. However, the ionizing radiation process if not controlled may provoke degradation due to polymer chain scission and/or cross-linking, thus affecting the final material properties [4-5]. The objective of this work was to investigate the effects of gamma irradiation under ambient conditions on the morphology, the molecular weight, and the thermal and mechanical properties of PHBV/Cloisite 30B bionanocomposite at 3 wt % of filler content. The changes in polymer properties were evaluated at doses of 5, 15, 25, 50 and 100 kGy by several techniques involving size exclusion chromatography (SEC), differential scanning calorimetry (DSC), thermogravimetric analysis (TGA), dynamic mechanical analysis (DMA), tensile testing and scanning electron microscopy (SEM). Through size exclusion chromatography (SEC) analysis, a significant decrease in both weight and number average molecular weights was noted with increasing the radiation dose resulting from chain scission mechanism. Differential scanning calorimetry (DSC) data indicated a decrease in the degree of crystallinity (Xc) and melting temperature (Tm) after gamma irradiation exposure, with the appearance of double melting peaks related to the changes in the crystal structure of PHBV. Thermal stability, tensile and thermo-mechanical properties were also reduced, being more pronounced for the neat PHBV.

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Biography

Author has her expertise in study of the durability of bionanocomposies PHBV/Cloisite 30B in various environments. Her focus is based on evaluate the effects of gamma irradiation on properties of PHBV/Cloisite 30B bionanocomposites . She was warded her PhD in 2015 from the University of BEJAIA, Algeria.

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Study on the non-destructive thermal diagnosis of bearing and variable rotational speed by temperature mapping in Infrared Thermography

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Abstract

The diagnosis of defects and state of supervision of rotating machines in the industry is very important to guarantee safety and the efficiency of production. In fact, these machine failures and defects can cause serious accidents leading to big production losses. To overcome this problem, the infrared thermography technique is frequently used as a predictive tool for electrical installations maintenance, given that the most installation faults lead to temperature increases in specific points or areas.

In this paper, an experimental study has been made to predict the presence of misalignment in a system. It is based on the shaft coupling temperature measurement, using a thermal imaging camera. In order to detect these misalignments, the temperature of the coupling has to be measured before reaching its steady-state value. The temperature measurements, using both infrared thermography at the locations under different load and speed conditions, have been also taken and correlated to the thermal imaging. It has been found that the measured transient spatial temperature distribution on the couplings indicates the presence of misalignment in the shafting system. The proposed method in this article can also be used in automated detection systems using thermography to detect misalignments. Results show that infrared thermography method could be adapted to monitor and early diagnose of bearing faults by evaluating, quantitatively, the temperature characteristics according to loading condition.

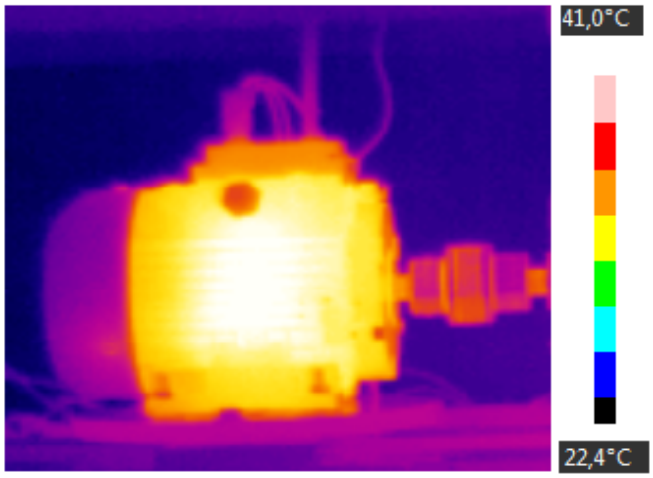

Figure. Steady heated motor

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Assessment of Air Pollutant Sources in Deterioration of the Ancient Rampart of Sale City—NW Morocco (SW of the Mediterranean Basin)

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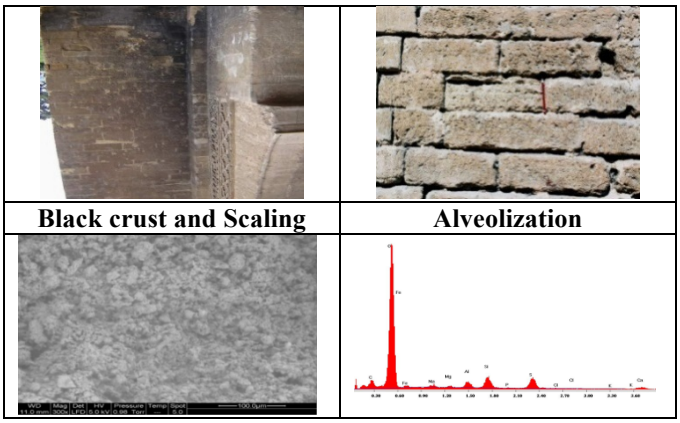
Abstract

The ancient rampart of Sale city shows a very advanced degree of deterioration patterns. To determine the relationship between the environment conditions and the stone decay, an elaborate study (X-ray fluorescence, Ion chromatography, X-Ray Diffraction, Scanning electron microscopy and Atomic emission spectrometry) has been carried out on decayed layers at the surface of the rampart. The results show that the deterioration of the stone is mainly related to atmospheric pollutants (SO_2, NO_x) and in the second row the action of marine sprays by Na^+ and Cl^-deposition. The crystallized gypsum ($CaSO_4 \cdot 2H_2O$) characterized the most of surface deposits and it's formed by calcarenite oxidation of ($CaCo_3$) particles reacting to atmospheric sulfur.



Black crust and Scaling	Alveolization

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Biography

Author has a large experience in environmental geoscience. Working on deterioration patterns of the monumental stones of Sale city and the Chemical analysis in relationship with the atmospheric pollutants and Marines influences. She is a PhD student in Faculty of Sciences, Mohammed V University, Rabat, Morocco.

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Analysis of some rocks using Laser Induced Breakdown Spectroscopy

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Abstract

LIBS is the acronym of Laser Induced Breakdown Spectroscopy, it is a simple analytical technique, rapid, accurate and non-polluting. It consists in focusing high power laser beam on sample's surface to create plasma [1]. The efficiency of this technique, its speed compared to other conventional analytical techniques, its simplicity and capacity of its applying to all types of materials solid, gas and liquid [2-3] has attracted a large number of researchers and industrialists in many fields [4-5].

In this paper, we exploited this technique to determine the chemical composition of three rocks of the oriental region of Morocco using a laser YAG (532 nm), pulsed (10 Hz), full width at half maximum (4 ns), delivering an average power of 1.82 W. The emission of the plasma is collected by an optical fiber and then dispersed by a spectrophotometer in the spectral range 250-1000 nm. The obtained spectrum revealed the existence of following chemical elements: Calcium, Sodium, Potassium, Manganese, Lead and Strontium.

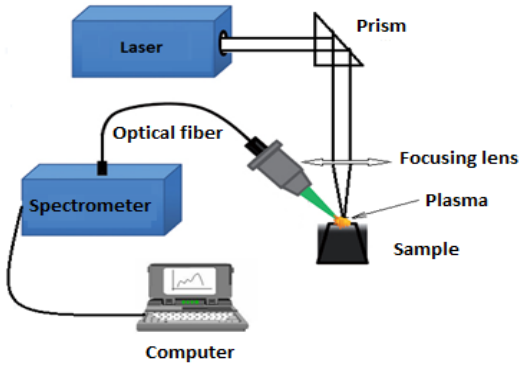

Figure 1 : Prototype setup of Laser Induced Breakdown Spectroscopy

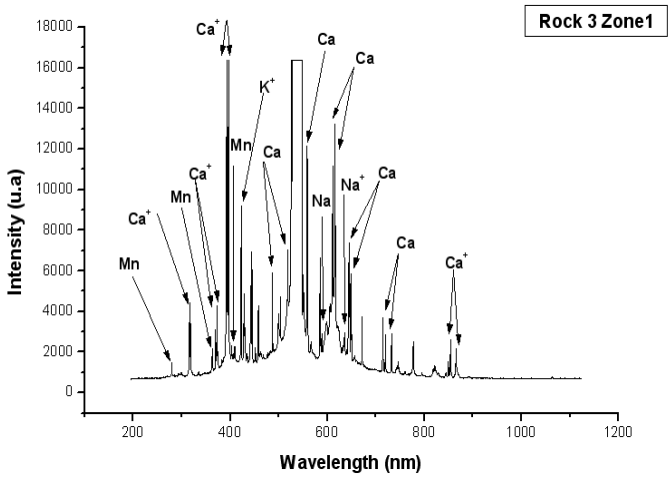

Figure 2 : The corresponding LIBS spectrum dominated mainly by Ca, Pb and some Sr, Na emission.

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The second International Conference on Materials Science and Environment ICMES'18 was organized by Mohammed Premier University, Faculty of Sciences and the Association: Moroccan Center for Development and Science (CEMADES), 26, 27 and 28 April 2018 in Saidia: the blue pearl of the Mediterranean under the theme "New materials for sustainable energy development". Following the success of the first edition organized in December 2016 and as part of the promotion of scientific tourism, ICMES2018 has invited internationally renowned researchers, Moroccans living abroad and radiant in their host society.

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It is a scientific platform to bring together multidisciplinary researchers and industrialists from around the world to expose and discuss the latest discoveries on Materials and their applications in environmental protection for sustainable and efficient development.

Five themes on the agenda of this scientific event: energy and renewable energies, environmental sciences and sustainable development, from Plant to biotechnology and electrical engineering. Our objective is to bring together researchers from different countries in order to pool their expertise and their respective work in order to promote the exchange of ideas and knowledge and to stimulate debates and advances around themes and objects of interest. More than 20 Speakers presented their recent work.

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