The first international Seminar on *Catalysis, Chemical Engineering & Green Chemistry*

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Dear Colleagues,

On behalf of the Organizing Committee, we are pleased to invite you to attend The first international Seminar on Catalysis, Chemical Engineering & Green Chemistry (CaCEG-2023) will be held in University of Echahid Hamma Lakhdar El Oued, Algeria, on February 22-23, 2023.

The purpose of the CaCEG-2023 international Seminar is to bring together researchers, practitioners and educators to exchange and share their experiences and research results, as well as practical challenges encountered and solutions adopted in the fields of Catalysis, Chemical Engineering and Green Chemistry, enabling these scientists to share scientific knowledge, and experience in the field of green chemistry and Chemical Engineering and is also to lay the groundwork for multidisciplinary and interdisciplinary studies for the advancement of science and technology. The main topic of the CaCEG-2023 is Green chemistry and Catalysis, but all subtopics are as stated in the "Topics" section.

With a theme of ‘Catalysis, Chemical Engineering, and Green Chemistry’, the CaCEG-2023 international, seminar features two days of scientific sessions, keynote & invited lectures, oral and poster presentations, as well as exceptional networking opportunities and a unique social program.

Yours sincerely,
Organizing Committee of CaCEG-2023
Dr. Pierre de Fremont, university of Strasbourg (France)

« NHC Gold(I) POM hybrids: efficient and versatile catalysts »

Pr. Malika Berredjem, Badji Mokhtar–Annaba University (Algeria)

« Novel Sulfonamide derivatives: Efficient Synthesis, biological activity, molecular docking, POM analyses and identification of pharmacophores sites »
NHC Gold(I) POM hybrids: efficient and versatile catalysts

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ABSTRACT

A series of supported phosphane and NHC gold(I) acetonitrile polyoxometalate hybridcomplexes were synthesized in high yields, upon reactions between gold(I) methyl- or hydroxyl- precursors and the acidic form of the polyoxometalates. They were characterized by NMR, MS-ESI spectroscopy as well as single crystal X-ray diffraction. In a preliminary catalytic study, their activity was assessed under heterogeneous conditions for the ene-yne rearrangement reaction and a cycloisomerization reaction. Additionally, their reactivity and recyclability were tested in the hydration of alkynes under homogeneous conditions. Overall, the complexes were found indefinitely stable in acetonitrile solutions. They displayed similar catalytic activities under homogeneous and homogeneous conditions.

Keywords: Orgonagold chemistry; N-heterocyclic carbene; polyoxometalate; catalysis.

References

Novel Sulfonamide derivatives: Efficient Synthesis, biological activity, molecular docking, POM analyses and identification of pharmacophores sites

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ABSTRACT

Sulfonamides are attractive molecules with potential application in the field of medical chemistry. It is known that sulfonamide containing derivatives demonstrate promising value in the development of protease inhibitors such as HIV protease, serine protease and metalloprotease [1]. It should also be mentioned that Supuran group’s [2] reported the design and in vitro antitumor activity of several classes of sulfonamide CAIs, shown to act as nanomolar inhibitors against the classical isozymes known to possess critical physiological roles, such as CA I, CA II and CA IV [3]. These compounds were also shown to exert potent inhibition of cell growth in several leukemia, non-small cell lung, ovarian, melanoma, colon, CNS, renal, prostate and breast cancer cell lines [4].

Our interest is focused on the preparation of novel derivatives of sulfonamide containing various pharmacophores such as phosphonate, oxazolidinone and nitrogen mustard. Our aim is to explore new selective antitumor agents, less toxic and more stable. Several novel highly functionalized compounds prepared by our group were evaluated for their in vitro antitumor activity against cancer cell lines (Jurkat, K562 and PRI).

In order to evaluate the interactions of new sulfonamide derivatives with human enzyme, molecular docking simulation was performed to explore the binding mode of the prepared compounds in the active site of various target based on binding mode of previously refined structures of sulfonamide complex.

References

# Table of contents

**T1: Organometallic Chemistry and Catalysis**

Al-pillared montmorillonite as effective heterogeneous catalyst for the synthesis of dihydropyrimidinone in solvent and under solvent free conditions, Bouremmad Farida [et al.] ................................................................. 1

Multi-component Synthesis of New Fused Benzo-Heterocyclic Compounds and Evaluation of Their Biological Activity, Bouguessa Ichrak [et al.] ................. 3

In Vitro and In Silico Evaluation of N6,9-bis(ferrocenylmethyl)adenine as an Anticancer Drug, Lanez Elhafnaoui .............................................................. 4

Synthesis of functionalized furans via palladium-catalyzed one-pot reaction of 1,3-dicarbonyl compounds with alkyl halides, Haiouani Kheira [et al.] ............. 5

Synthesis and gas adsorption of porous porphyrin polymer, Louafi Fadila [et al.] 6

Green Synthesis Of Nanoparticle And Its Photocatalytic Activity Towards Water Soluble Toxic Dyes, Rouiha Zohra ......................................................... 7

Non-Symmetrical Manganese(III) Complex: Organometallic Synthesis, Electrochemistry and Catalytic in the oxidation of cyclohexene, Bendia Sabrina .......... 8

Synthesis and Structural Characterization of Organometallic Chromogen, Benaouida Mohamed Amine [et al.] ................................................................. 9


Green synthesis of manganese oxide nanoparticles prepared by Ocimum basilicum L. leaves aqueous extract and their characterization, Bulaaeres Islam [et al.] .. 11

Synthesis and antimicrobial activity of novel a-aminophosphonates derived from amino-alcohols, Bahadi Rania [et al.] ....................................................... 12
Synthesis and Antioxidant Activity of Novel Quinoxaline Derivatives, Youmbai Rabia [et al.] ................................. 13

A Simple and Ecofriendly One-pot Synthesis of New 3-Cyano-2-Pyridone Derivatives., Kebaili Asmaa [et al.] ....................................................... 14

Synthesis of new biologically active molecules via Betti reaction, Ghodbane Racha 15

Synthesis and Characterization of Novel Fused-Pyrrole Derivatives as Potent Antibacterial and Antioxidant Agents, Adaika Chaima [et al.] ............................... 16

Investigation of industrial impregnated Y Zeolite acidity. Effect of metal loading., Mahdi Roufaida [et al.] ............................................................... 17

Synthesis of a new complex derived from (E)-4-((2-hydroxybenzylidene) amino) benzenesulfonamide, Mansouri Achraf [et al.] ................................. 18

Reactivity of ZnO material in Biginelli Synthesis, Messaoudi Hassiba ................. 19

Volumetric properties of binary and quaternary mixtures of 2,2,2-trifluoroethanol, 2-propanol, methanol, ethanol, acetone and water at Temperature 298.15K and Pressure 0.1 MPa, Khalil Guelifet .......................................................... 20

Evaluated of catalytical and antibacterial activities of Pd(II)- acetaminophen complex-based drug, Hamrani Ouiza ........................................ 21

Synthèse of Tetrahydrobenzo(a)Xanthen-11-ones with PPh3, Badaoui Kawther [et al.] ................................................................. 22

Synthesis of fused heterocyclic systems based on maleimide, Bentarzi Yamina . 23

Synthesis of new sulfonamide derivatives under microwave and ultrasonic irradiation, Boussaker Meriem ...................................................... 24

Anti-inflammatory Activity of ferrocene derivative Using a Spectroscopic Approach and Molecular Docking, Saada Zahra ........................................ 25

DFT studies on Geometric, vibrational and electronic spectra, HOMO–LUMO of N-ferrocenylmethylaniline., Djarallah Marwa ............................... 26

Étude in vitro et in silico de l’activité antidiabétique d’un dérivé ferrocénique ‘FMA’, Benine Aida ................................................................. 27

T2: Photochemistry, Photobiology, and Electrochemistry 28
Electrochemical experiments and superoxide anion scavenging assays were used to examine the antioxidant capacity of Moringa Oleifera flowers collected from the Algerian Sahara., Amar Djemoui ............................... 28

The effect of Citrus Paradisi Essential Oil in HeLa and MCF-7 tumor cells, Bochra Gargouri ................................................................. 30

Nigella Sativa Paste extract as green corrosion inhibitor for aluminum in 1M HCl, Abderrahmane Sihem ................................................. 31

Study of the influence of temperature on the inhibitory effect of Borago officinalis against the corrosion of an mild steel, Youbi Asma ............................ 32

Molecular Design Based on ab-initio Calculations of an Organic Molecule for Corrosion Protection, Rachid Belkada [et al.] ............................. 33

The study of the corrosion of a Polyaniline-based coating doped in a 3.5% NaCl solution, Mounir Nacer ......................................................... 34

Characterization and Electrocatalytic Properties of Ni doped Perovskite Oxide, Kherief Yahia [et al.] ................................................................. 35

Synthesis, Characterization and photocatalytic activity of ZnO thin films under UV and Solar Light, Djafarou Roumaissa [et al.] ................................. 36

Traditional Applications of Plant Latex in The Genus Euphorbia in Medicinal and Therapeutic uses. A mini Review, Segueni Khaoula ......................... 37

Photocatalytic study of synthesized TiO2 by sol-gel process, Ikermaid Dalila .. 38

Investigation of the antioxidant and anti-diabetic activity in vitro of Moringa Oleifera flowers extracts from Algerian Saharan., Amar Djemoui ................. 39

Antioxidant and Antibacterial Capacity Assessment of Helianthemum lippii Extract and silver nanoparticles, Laib Ibtissam [et al.] ............................ 40

Butanolic Extract of Moringa Oleifera leaves from Algerian Sahara as Corrosion Inhibitor of 6063 Aluminium Alloy in 1 M Hydrochloric Acid Medium, Djamila Djemoui .................................................. 41

Antimicrobial activity of MeOH extract of bassia muricata against pathogenic bacteria, Gheraissa Noura [et al.] ................................................. 42

Synthesis and characterization of graphene by electrochemical exfoliation of rod graphite, Tei Siham ............................................................ 43
The biological activity of the ethanolic extract of Neurreada procumbens L., Kherraz Khaled ........................................... 44

Electrochemical elaboration and characterization of polybithiophene/ZnO composite material for solar cells application, Lamiri Leila [et al.] .................. 45

Antioxidant activity and phenolic compounds of Algerian Teucrium polium L. Medicinal plant used traditionally for treatment of digestive system disorders, Messaoudi Mohammed ................................................................. 46

Development, characterization and application of efficient electrocatalysts in fuel cells, Benaissa Asma [et al.] ......................................................... 47

Total phenolic content, antioxidant and anti-Inflammatory of Unripe Fruit of Pistacia atlantica aqueous extract, Mokhtar Benmohamed ........................ 48

Electrodeposition of ZnO/FTO layers from solutions with different concentrations of zinc precursor: Characterization and photocatalytic tests., Rahal Foudil [et al.] 49

Phytochemistry and antibacterial activity of essential oils from the leaves of Juniperus oxycedrus ssp, at the fruiting stage, growing in Oum El Bouaghi (semi-arid zone), Bassa Nora [et al.] ............................................................ 50

T3: Catalysis and the Environment

Modeling of the adsorption kinetics of a continuous process for the elimination of fluorides by electrocoagulation, Tounsi Hanane ......................... 51

Ultrasound-promoted green synthesis under Cs5HP2W18O62 catalysis of a series of N-cyclic imides substituted benzenesulfonamide, Bougheloum Chafika ..... 53

Adsorption of 2,4-dichlorophenol on Mg2-Al Lamellar double hydroxide Kinetic and thermodynamic study., Rouahna Noureddine .................... 54

Sensitive detection of bisphenol A in water, based on an electrochemical aptasensor, Kazane Imen ................................................................. 55

Adsorption of strontium (II) ions from aqueous solution by bottom ash of expired drug incineration: Parametric, kinetics and thermodynamic studies, Brahim Abdelkarim [et al.] ................................................................. 56

Comparison of the inhibitory effect of three water on the oxalo-calcic crystallization in vitro study, Bensatal Ahmed ........................................ 57

Treatment of water polluted by methylene blue using the method of adsorption by activated carbon prepared from the nucleus of the olive, Khiouani Adel .... 58
Box–Behnken optimization of anionic azo dye biosorption by chitosan/illite kaolinite composites from aqueous solutions: Kinetic and equilibrium investigations, Ammar Zobeidi [et al.] ................................................................. 59

Determination of metals carried by TSPs in a suburban site of Algiers by nuclear techniques, Iazzourene Ghania [et al.] ................................................................. 60

Black Cumin Cake extract as an eco-friendly Corrosion Inhibitor on A9M Ordinary Steel in 0.5M H2SO4, Maalem Badreddine ................................................................. 61

The Kinetic of biogas Production by an anaerobic co-digestion process : effect of ultrasonic pre-treatment in thermophilic phase, Kheiredine Bani ......................... 62

Removal of cationic dye from aqueous solution by adsorption process using local agricultural waste, Gherbia A ................................................................. 63

The exploitation of the Peanut Shells wastes and converting into sustainable materials as low cost adsorbent that contributes to water pollutant sequestration., Reghiooua Abdallah [et al.] ................................................................. 64

Adsorption of methylene blue from aqueous solution onto NaOH-modified date palm fibers, Zeghoud Laid [et al.] ................................................................. 65

Extraction and characterization the cellulose from peanut shells and application in adsorption of Methylene Blue Dye from Aqueous Solutions., Terea Hafidha . 66

Extracting cellulose from agricultural waste and using it to remove organic pollutants from water, Khaoula Alia ................................................................. 67

Montmorillonite K10 catalyzed synthesis of new 1-(substituted benzo(d)thiazol-2-yl) cyclic imide derivatives, Abdelrani Messalhi ................................................................. 68

Valorization of Bottom Ash of Expired Drug Incineration as adsorbent to remove strontium (II) ions from aqueous solution: Characterization studies, Brahimi Abdelkarim [et al.] ................................................................. 69

The Influence of Precursor/Plant Extract Concentrations (Volume Ratio) on the Elaborated Zinc Oxide Nanoparticles Photocatalytic Activity, Djafarou Roumaissa [et al.] ................................................................. 70

In Situ Synthesis of a Polyaniline/ iron oxide Composite materials for Dye Removal by Adsorption, Belgherbi Ouafia [et al.] ................................................................. 71

Synthesis of ZnO Nanoparticles Using Different Sources of Chitosan: Effects on Photocatalytic Degradation of AZO Dye, Hemmami Hadia ................................................................. 72
Adsorption of cationic dyes from aqueous solutions using enhanced clay by green algae, Atia Djamal [et al.] .......................................................... 73

Green synthesis of Zinc Oxide Nanoparticles: Characterization and Applications, Kir Imen .......................................................... 74

Effect of pyrolysis temperature on removal efficiency of dyes, Hamida Khadidja [et al.] .......................................................... 75

Comparative study on the adsorption of anionic and cationic dyes by using Palm-Date trunks as adsorbent, Mehellou Ahmed ........................................... 76

Removal of Ca2+ cation by membrane S-PES modified with silica functionalized, Benoumena Hala [et al.] .......................................................... 77

Biosynthesis of MgO NPs using Chitosan extracted from Pimelia payraudi Latreille, Ben Amor Ilham [et al.] .......................................................... 78

Reactivity of copper based catalysts in the green organic synthesis of 3,4-dihydropyrimidinone: effect of the combined oxide, Slyemi Samira [et al.] .......................................................... 79

Experimental study and study of molecular dynamics on the properties of nanoparticles of carbon-based materials, Ben Amor Asma [et al.] .......................................................... 80

Waste utilization in Water pollution treatment, Akroum-Amrouche Dahbia .......................................................... 81

Sonochemistry in Transition Metal Catalyzed coupling Reactions using in DMF/water, Said Khemais .......................................................... 82

Improved photocatalytic degradation of Coomassie brilliant blue G-250 dye on the new CuCo2O4/CdS hetero-system under solar irradiation., Bouaoune Ahmed 83

Modeling and process optimization of renewable energy production, Akroum Hamza 84

Green Synthesis of copper oxide Nanoparticles using plant extract, Hacine Gherbi Ahlam .......................................................... 85

Synthesizing 3,4-dihydropyrimidine-2-(1H)-one in the presence of Co-ZnO and Ni-ZnO, Kheffache Ouzna .......................................................... 86

Study of the Physical and Chemical Quality of Runoff water from Urban Surfaces, Benrejdal Fazia .......................................................... 87

Elimination of diclofenac by elaborated bio-composite based on Moringa Oleifera and modified Alginites., Benamirouche Ouissem .......................................................... 88
Environmental Effect of Caracterization of Water Resources in Algiers Watershed (Bouira area), Haddad Habiba ............................................. 89

Synthesis of aluminosilicates type zeolite from natural products from the south west Algerian area by hydrothermal, Bettioui Fatima Zohra ......................... 90

Use of glass waste to elaboration of a new ceramic, Lachibi Farid ................. 91

Green synthesis of spherical TiO2 nanocomposite using Aspergillus carbonarius fungus: Excellent photocatalytic water decontamination agent for RR 18 dye, Bouras Hadj Daoud ............................................. 92

The PV Industry Needs and Waste, case of Removal of one Dominant Pollutant Ion by Different Techniques, Djouadi-Belkada Fadila [et al.] ....................... 93

The photocatalytic degradation of methyl blue in the presence of synthesized material ZnWO4, Ounis Amina [et al.] ............................................. 94

Mn(II) ion elimination study on blast furnace slag: kinetics and thermodynamics, Chouchane Sabiha ......................................................... 95

Activation of activated carbon based on date palm waste and application to the environment. Adsorption of a textile dye, Djaber Sabah ......................... 96

Removal of cationic and anionic dyes from aqueous solutions using nitronite clay: isotherm, kinetics and thermodynamic study, Besserni Rabia ....................... 97

Electrochemical degradation of methyl green in aqueous solution by oxidation process, Neghmouche Nacer Salah ............................................. 98

T4: Reaction Chemistry and Engineering ............................................. 99

DFT Calculations for Corrosion Inhibition of heterocyclic compounds, Kerassa Aicha [et al.] .............................................................. 99

A DFT and molecular docking investigation of new Au (III) and Fe (III) based complexes as Anti-cancers., Arbia Yassamina [et al.] ............................. 101

Prediction of thermal Energy of aliphatic Aldehydes using QSPR approach and MLR technique, Souyei Belgacem .......................................... 102

Ibuprofen sodium salt sorption onto strongly basic exchange resin: IRN-78, Benmosbah Mongi .............................................................. 103

Comparative study by molecular modeling of the structural properties and the reactivity of a donor-π, Khammar Rachida [et al.] ............................. 104
Non-thermal plasma technology for biodiesel production Mechanisms and reactors configuration., Serouti Abdelghani [et al.] ................................. 105

Theoretical and crystallographic study of a new derivative α-sulfamidophosphonate, Redjemia Rayenne [et al.] ................................................. 106

Molecular docking on Deguelin analogues as inhibitors of Hsp90 protein, Boucha- gra Samah ................................................................. 107

Synthesis, antimicrobial activity, molecular docking and ADME study of novel N-acylsulfonamides, Dekir Ali ................................................. 108

Investigation of intermolecular in inclusion complexes of Guanosine with hydroxypropyl-beta-cyclodextrin using DFT, Hayahem Sakina ......................... 109

Catalytic isomerization of light Naphtha (C5/C6) in the Penex unit of the Skikda refinery., Boudjemma Amir Lehtihat ............................................. 110

QSAR Modeling And Molecular Docking Of Some Heterocyclic Compounds, Derki Nour Elhouda .......................................................... 111

Redox dry wet gel spinning of pva hmw high strength, Dehmchi Farouk ........ 112

Microstructure and mechanical properties of Fe based alloy prepared by mechanical milling, Rekik Mohamed Ali .............................................. 113

T5: Biodiversity 114

Study of effective products and biological properties of Bunium mauritanicum, which grows in the high plains of Algeria., Tamma Noureddine .......... 114

Effects of the combination of natural extracts on their antioxidant activity, Bedjou Fatiha [et al.] ......................................................... 116

Lignans from n-butanol extract of aerial parts of helianthemum sessiliflorum, Ben- abdelaziz Imane ............................................................. 117

A new indole alkaloid of crude extracts from Saccocalyx satureioides, Kherkhache Hayat ................................................................. 118

Analysis of Floristic Biodiversity of the Afghan Djebel Cedar Grove, Nouioua Wafa119

Study of the conversion of fermentable sugar from Balanites aegyptiaca fruits into bioethanol, Boulal Ahmed [et al.] ....................................... 120

Antibacterial activity of Pulicaria odora extracts, Touati Naima [et al.] ........ 121
In vitro inhibition of urolithiasis by secondary metabolites extracted from Quercus ilex leaves, Bensatal Ahmed .................................................. 122

Effect of Heat Treatment on the Antioxidant Activity of Zygophyllum album L Honey, Mesbahi Mohammed Adel ........................................... 123

Essential Oils Extracted from Algerian Highlands Medicinal and Aromatic Plants: Yields, Organoleptic Qualities, Chemical Composition and Antibacterial Activities against E.coli ATCC 25922 and Pseudomonas aeruginosa ATCC 27853, Mansouri Narimene [et al.] ......................................................... 124

Systemic immunity in apple is activated by the deployment of sugar against codling moth (Cydia pomonella L.) in semi-arid region (Batna, Algeria), Brahim Imene ................................................................. 125

Preliminary analysis of the chemical composition of a hydrau-acetone extract of Algerian propolis, Bambra Moussa Abderrazak [et al.] ................................................................. 126

Neutrophil Extracellular Traps (NETs) modulation using natural bioactive compounds, Ben Mansour Riadh [et al.] ................................................................. 127

In vitro potential anticancer activity against HeLa and MCF-7 cancer cells lines and lipid peroxidation effect of GC-MS compounds of Punica granatum peel essential oil, Kallel Imen [et al.] ................................................................. 128

Evaluation of bioactive contents, antioxidant and anti-proliferative activities of acetate extract of Fagonia longispina, Djebbari Radja ................................................................. 129

Antioxidant activity of essential oils of Pituranthos (Pituranthos scoparius) and the protective effect towards oxidation of soybean oil, Anis Chikhoune ................................................................. 130

Evolution of Phenolic Compounds During Maturation of the Deglet-Nour Variety, Lekbir Adel [et al.] ................................................................. 131

Effects of plowing tools on the yield of a durum wheat crop after having their effect on the properties of the soil (region of Tingad Batna), Zaaboubi Siham ................................................................. 132

Antioxidants Activities of Extract of WhiteWormwood (Artemisia herba alba), Noui Yassine ................................................................. 133

Cleaning the natural environment from petroleum substances using Green Technology, Sawicka Barbara ................................................................. 134

In Vitro Anti-inflammatory Activity and chemical composition of Essential Oils from Smyrnium olusatrum L. from Algeria., Djellouli Soumia ................................................................. 135
The influence of temperature on the kinetics of antioxidant activity and phenolic compounds in extracts of Origanum majorana grown in El Oued (Algeria), Neghmouch Nacer Salah ........................................ 136

Polyphenol content and antimicrobial activity of olive oil from semi-arid area in Algeria, Zemour Kamel ................................................................. 137

Artemisinin and Crystal purity Evaluation in Algerian Artemisia spp wild plant using HPLC method, Ahmed Laloui Hanza ............................................. 138

In vitro and in silico antibacterial tyrosyl-tRNA synthetase activity of the aqueous extract of olive leaves, Elkolli Meriem ................................................. 139

High Antioxidant Capacities and Anti-inflammatory Effects of Hammada elegans Botsch. Extracts: An in vitro Assessment, Bensafiddine Feriha ............... 140

Anti-inflammatory potential of water-soluble polysaccharides derived from some spontaneous medicinal plants on activated human neutrophils, Mahcene Salem [et al.] ......................................................... 141

Antioxidant activity of aqueous extract of Ajuga iva grown in Algerian steppe (Djelfa province), Rahmani Salah-Eddine ........................................... 142

The antioxidant activity of alkaloids extracted from Peganum harmala L., Kadri Mounira .............................................................................................. 143

Characterization and evaluation of some biological activities of produced secondary metabolites of Penicillium specie isolated from industrial waste, Chemmam Dounya Achwak .......................................................... 144

LC-MS analysis of Centaurea papposa extract, Cheribet Mawahib .................. 145

Antibacterial activity of Artemisia herba-alba and Artemisia campestris against pathogenic bacteria, Kahina Belbachir ............................................. 146

Determination of hydrolytic and insecticidal activities and germination activation of durum wheat seeds (Triticum durum) by rhizospheric bacteria (PGPR), Benazzouz Kinza ......................................................... 147

Study of the antioxidant, anticoagulant, antifungal and antibacterial activity of Ocimum Basilicum L., Merzouki Soraya .............................................. 148

Characterization Quantification and Qualitative of the Phenolic compounds and antioxidant activity of Helianthemum Lippi L, Abir Fouhma [et al.] ............. 149

The in vitro antioxidant potential and phytochemical content of aqueous extract of local fenugreek seeds, Trigonella foenum-graecum L., Hachouf Maram ...... 150
HPLC analysis and antioxidant activity of methanolic extract of Cistanche tinctoria (Desf.) Beck. (Orobanchaceae), Cherrada Nezar [et al.]  

Synthesis, Characterization and Antioxidant Activity of Functionalized Graphene Oxide Nanoparticles with 4-(ferrocenylmethylamino) Benzonitrile, Mammadi Nardjess  

Chemical composition and characterization of some Tunisia plant oils and investigation of their antioxidant and antibacterial activities, Moalla Rekik Dorsaf  

Chemical study of crude turnip extracts (Brassica rapa subsp. rapa) grown in the region of El-Oued., Debbeche Hanane  

Synthesis and spectroscopic study of benzodiazepinones, Khier Nawal [et al.]  

Green Synthesis: An Eco-friendly Route for the Synthesis of Copper Oxide Nanoparticles, Ben Cheikh Chaimma  

Biosynthesis, Characterization, And Evaluation Of The Biological Activities Of Nanoparticles Synthesized From Plant Extract, Derki Maroua  

In vivo antimicrobial effect of methanolic extract of Apium graveolans seeds from Western Algerian region, Abdelsadok Imane [et al.]  

Antioxidant and anti-mastitis activity of some essential oils, Merzouk Hafida  

Review on biological activities of Artemisia compestris, Cherfi Inasse  

Development of new biocomposite materials impregnated with plant extract to inhibit the growth of pathogens, Yousfi Fatima Zohra  

In vitro Antimicrobial Synergy Of PLGA /Silver Nanocomposites Prepared By Green Chemistry, Henda Daoudi  

Chemical Composition and Antibacterial activity of Essential Oil of Marrubium vulgare from Eastern Algeria, Abadi Abderrezzek  

Antivenom potential of a medicinal plant (Matricaria pubescens) against the venom of (Cerastes cerastes) from the Saharan region of Algeria (Souf), Mouane Aicha  

Study of the chemical and biological activity of the aerial part Cyperus Fuscus .L sedge plant, Senigra Moussa  

The essential oil of Origanum majorana L was extracted from El Oued, and its chemical composition, olfactory evaluation, and antioxidant effects were studied, Ben Amor Mohammed Larbi [et al.]  

11
T1: Organometallic Chemistry and Catalysis
Al-pilled montmorillonite as effective heterogeneous catalyst for the synthesis of dihydropyrimidinone in solvent and under solvent free conditions

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ABSTRACT

In this work, we are interested in synthesis, characterization and heterogeneous catalytic properties of an Al-Pillared montmorillonite.

The synthesis is based on the direct cation exchange method which consists of the incorporation of an aluminium hydroxyl polycation into the raw montmorillonite-Na. The structural characterization is performed by X-ray diffraction (XRD) and Fourier Transformed Infra-Red (FTIR).

The prepared Al-Pillared montmorillonite is used as a heterogeneous catalyst for the one-pot Biginelli reaction whose purpose is the synthesis of dihydropyrimidinones which are heterocyclic systems with important biological, pharmaceutical and therapeutic properties. The reaction was carried out by using glycerol as solvent and under solvent-free conditions.

The obtained results are very interesting; first XRD shows that the aluminium hydroxyl polycation was incorporated into the Na-montmorillonite since the basal spacing increased up to 16 Å, then different acid sites (Brönsted and Lewis) were shown by pyridine adsorption in FTIR spectroscopy.

The catalytic tests on dihydropyrimidinone synthesis by Biginelli reaction in the presence of Al-pillared montmorillonite as heterogeneous catalyst show that the reaction is better in solvent free conditions than in presence of glycerol as solvent, indeed the yields in the solvent free conditions is 96\% in 4h comparing to 43\% in the same time in glycerol as solvent.

In conclusion, this work deals perfectly with green chemistry, since a natural low cost and abundant material is used in heterogeneous catalysis, in addition very interesting results were obtained in solvent free conditions.

Keywords: Montmorillonite; heterogeneous catalysis; green chemistry; dihydropyrimidinone.

References

Multi-component Synthesis of New Fused Benzo-Heterocyclic Compounds and Evaluation of Their Biological Activity

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ABSTRACT

In the search for new heterocyclic compounds that are biologically active or may generate an immune response to various infectious and inflammatory diseases, we recommend the Biginelli reaction for the synthesis of novel fused heterocyclic compounds. This reaction is based on acid catalyzed three-component condensation of sodium oxalocetate, aromatic aldehydes and nitrogen nucleophile in ethanol as solvent. All the synthesized products were characterized by the usual spectroscopic methods: FT-IR and NMR (\textsuperscript{1}H and \textsuperscript{13}C). All newly compounds were screened for their \textit{in vitro} antioxidant and antibacterial activities.

\textbf{Keywords:} Nitrogen heterocyclic, multi-component reaction, antibacterial activity, antioxidant activity.

References


In Vitro and In Silico Evaluation of N^6,9-bis(ferrocenylmethyl)adenine as an Anticancer Drug

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ABSTRACT

The in vitro evaluation of the interaction between N^6,9-bis(ferrocenylmethyl)adenine and double-stranded DNA, and bovine serum albumin was carried out using cyclic voltammetry and electronic spectroscopy essays to confirm the formation of (Fc)_2Ad-DNA and (Fc)_2Ad -BSA. The binding constant and the binding free energy of the obtained adduct calculated from voltammetric measurements were in good agreement with those obtained from electronic spectroscopy studies. The computational molecular docking technique was used for the in-silico evaluation using AutoDock 4.2 docking software. The molecular structure of the ligand was built and optimized at the level of density functional theory DFT with DFT/B3LYP method combined with 6-311++G(d,p) basis set using Gaussian 09 program package. The crystal structures of both DNA (PDB ID: 1W0T) and BSA (PDB ID: 3V03) were imported to the AutoDock molecular docking software. The docking analyses confirm the formation of the adducts.

Keywords: cyclic voltametry; electronic spectroscopy; AutoDock 4.2; DFT; N^6,9-bis(ferrocenylmethyl)adenine.

References

Synthesis of functionalized furans via palladium-catalyzed one-pot reaction of 1,3-dicarbonyl compounds with alkyl halides

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ABSTRACT

Functionalized furans are structural features of naturally occurring and biologically active molecules, as well as in various pharmaceutical products\textsuperscript{1,2} and flavoring and fragrance compounds\textsuperscript{3,4}. Furans also used as building blocks in organic synthesis\textsuperscript{5,6}. For these reasons, A new and efficient two-component alkylation-cyclization reaction catalyzed palladium was developed, producing functionalized furans in good yields from readily accessible and low cost starting materials, 1,3-dicarbonyl compounds and allyl bromide. The reaction conditions and the scope of the process were examined, and a possible mechanism is proposed.

Keywords: Furan; Palladium catalyst; One-pot reaction; Allyl bromide; 1,3-dicarbonyl compounds.

References

Synthesis and gas adsorption of porous porphyrin polymer

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ABSTRACT

Advancement of society largely depends on usage of petroleum products and burning of fossil fuels, which emit CO2, one of the major greenhouse gases responsible for global warming. With the advancement of the society, the carbon level in the atmosphere is increasing and the situation is turning worse day by day. Hence, novel strategies for developing highly efficient materials for CO2 sequestration or separation from flue gases are very demanding and have a direct environmental impact via greenhouse gas remediation. The use of different natural and solid organic materials as adsorbents with interesting environmental and economical properties, has made the adsorption even more attractive and an alternative or complementary to other techniques. The synthesis of nitrogen rich microporous materials has gained significant attention due to their potential as solid adsorbents for CO2 capture. These microporous materials include, but are not limited to, metal–organic frameworks (MOFs), zeolitic imidazolate frameworks (ZIFs), and hypercross-linked microporous polymers (BILPs, POPs, etc.). The key strategy to develop new and efficient POPs mainly relies on the design of nitrogen rich building blocks that possess high surface areas.

Porphyrin based organic polymers are very exciting in this context due to the presence of basic pyrrole containing macrocyclic cavity, which facilitates strong interaction with Lewis acid. This material possesses high surface area and exhibited outstanding adsorption capacity may thus contribute significantly in wide-scale applications in environmental research. In this work, a new microporous polyporphyrin has been synthesized and structurally characterized, and it shows permanent porosity and high CO2 uptake.

Keywords: adsorption; polymer; petroleum products; Porphyrin.

References

Green Synthesis Of Nanoparticle And Its Photocatalytic Activity Towards Water Soluble Toxic Dyes

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ABSTRACT

Nowadays, the application of nanotechnology is exponentially increasing in different therapeutic and agricultural activities, such as antibiotics, anticancer, antimicrobial agents, and bio-fertilizers. One of the challenges in modern nanotechnology is the development of reliable, safe protocols for the synthesis of nanoparticles. Therefore, exploring innovative, cost-effective, non-toxic, and eco-friendly sustainable approaches should be of critical interest. So, green nanotechnology has suggested developing cost-effective and environmentally sustainable techniques to fabricate metallic nanoparticles. We report the synthesis of MnO nanoparticles using biological molecules of Ziziphus spina-christi leaf extract as the reducing agent and characterised by UV Vis spectroscopy, and FTIR techniques. Then, the catalytic activity of the as-synthesized/ MnO nanoparticles was evaluated by degradation study of water soluble dyes methylene blue using laboratory scattered sunlight as light source.

Keywords: MnO, Nanoparticles, UV Vis Spectroscopy, FTIR, Photocatalytic Activity

References

Non-Symmetrical Manganese(III) Complex: Organometallic Synthesis, Electrochemistry and Catalytic in the oxidation of cyclohexene

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ABSTRACT

Organometallic-Schiff base complexes are currently of great interest to scientists due to their multiple applications: homogeneous, heterogeneous catalytic oxidation [1,2] or in biological activity [3] and in bio-detection [4] such as biosensors. Hereafter, we report on the synthesis and characterization of manganese(III) complex as well as their applications in the catalytic oxidation of cyclohexene by molecular oxygen. Cyclic voltammetry in dimethylformamide revealed reversible redox processes.

Keywords: Manganese(III); Non-Symmetrical; Synthesis; Electrochemistry; Catalytic Oxidation.

References

The First International Seminar on Catalysis, Chemical Engineering & Green Chemistry

Synthesis and Structural Characterization of Organometallic Chromogen

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ABSTRACT

Recently, 1-phenylazo-2-naphthol derivatives have attracted attention because the phenylazo-naphtholate group can provide N,O-bidentate chelation to stabilize transition or main group metal complexes. The solid structure of \([\text{Cu(C}_{16}\text{H}_{10}\text{N}_{2}\text{OCl})_{2}]\), involves the preparation of a copper (II) complex dye \([\text{Cu-L}_{2}]\). This material has been characterized by elemental analyses, IR, NMR, X-ray crystallography. The X-ray study has indicated that the Cu II atom is located on an inversion center and is tetracoordinated by two N and two O atoms from two bidentate 1-[(E)-(2-chlorophenylazo)-2-naphtholate] ligands, forming a square planar geometry. The two N atoms and two O atoms around the metal center are trans to each other. The average distances between the Cu II atom and the coordinated O and N atoms are 1.8990(17) and 1.9634(19) \(\text{Å}\), respectively.

In the crystal, molecules are linked via weak C—H----O and C—H----Cl hydrogen bonds, forming chains propagating along [010]. There are also \(\pi--\pi\) interactions present involving adjacent naphthalene rings [centroid–centroid distance = 3.661 (13) \(\text{Å}\)].

Keywords: Crystal structure; Organometallic; Azo ligand; X-ray diffraction; Copper II.

References

4. S Chetoui, N Hamdouni, G C Bochet, J P Djukic, C Baillye. Crystal structure of bis\{1-[(E)-(3-methoxyphenyl)diazenyl]naphthalen-2-olato\}N\textsuperscript{2},O:O\textsuperscript{2}bis\{1-[(E)-(3-methoxyphenyl)diazenyl]naphthalen-2-olato\}N\textsuperscript{2},O)copper(II). \textit{Acta Cryst.} 2015, E71, m211–m212.
ABSTRACT

Nanotechnology is a developing branch of pharmaceutical sciences wherein the particles extend in nanosizes and turn out to be more responsive when contrasted with their unique counterparts (1). Metal nanoparticles (MNPs) and metal oxide nanoparticles (MONPs) are used in numerous fields (2). Selenium is essential element for the living beings life (3). Recently, selenium nanoparticles (SeNPs) attracted the interest of many researchers due to their biocompatibility, bioavailability, and low toxicity (4). This study aimed to use the *Sonchus maritimus* aqueous extract in order to prepare selenium nanoparticles by eco-friendly method. The phytochemical analysis of the plant extract was prepared by using standard protocols. The nanoparticles were characterized from structural and morphological point of view by using analytical techniques such as: UV-Vis spectroscopy, Fourier Transform Infrared Spectroscopy (FTIR), Scanning Electron Microscopy (SEM) and Energy Dispersive X-ray Analysis (EDX). The SEM analysis revealed that the particles size registered around 26.48 nm. The success of the formulation of the NPs reflects the potential properties of the hydro-soluble compounds that have been revealed in *Sonchus maritimus* as biocatalyst or natural stabilizers for SeNPs synthesis. This study reports for the first time a green approach for SeNPs biosynthesis using *Sonchus maritimus* aqueous extract.

**Keywords**: SeNPs; *Sonchus maritimus*; SEM; UV-VIS; IR.

References


3. Derouiche S, Ahmouda I, Moussaoui R. Effectiveness of a Novel SeNPs synthetized by Aquilaria malaccensis extract compared to selenium acetate on lead induced metabolic disorder and oxidative stress in pregnant rats. *Int j chem biochem sci*. 2021; 19: 50-57.

Green synthesis of manganese oxide nanoparticles prepared by *Ocimum basilicum* L. leaves aqueous extract and their characterization

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**ABSTRACT**

Plant-based NP green synthesis is now regarded as a gold standard among these green biological techniques owing to its ease of use and the diversity of plants. However, (MnO NPs) have gained importance in the synthesis and manufacturing processes because of their lower toxicity. The aim of this study was to prepare manganese oxide nanoparticles (MnO NPs) using *Ocimum basilicum* L. leaves aqueous extract. Bioactive molecules extraction and qualitative analysis of some phytochemicals compounds were released by using standard protocols. The characterization of biosynthesized MnO was analyzed by UV–Vis spectroscopy and Fourier transform infrared spectroscopy (FTIR). Results of phytochemical essays showed that aqueous extract of *Ocimum basilicum* L. is very rich on different chemical compounds such as cardio glycoside, anthraquinones, reduced sugar, flavonoids, phenols, catechic tannin, saponins and terpenes. Results appeared that the broad bell-shaped spectrum band was obtained by UV–Vis spectroscopy indicates the formation of MnO. Fourier transform infrared FTIR spectroscopy detected the vibration of the Mn—O bond that indicate the presence of manganese oxide nanoparticles. This study confirmed that aqueous extract of *Ocimum basilicum* L. is rich of important bioactives compounds that have potential properties as biocatalyst for the biosynthesis of manganese oxide nanoparticles (MnO NPs) which can be used in pharmacological and medical field.

**Keywords:** Manganese oxide nanoparticles; UV–Vis; FTIR; *Ocimum basilicum* L.; phytochemical.

**References**

Synthesis and antimicrobial activity of novel α-aminophosphonates derived from amino-alcohols
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ABSTRACT

α-Aminophosphonates have been used in a wide range of applications such as in the areas of agricultural and medicinal chemistry. They are also employed as antiviral agents, enzyme inhibitors, antibiotics, anticancer and antifungal agents and are extensively used as insecticides and herbicides.

In this work we have prepared a new derivatives of α-aminophosphonates via Kabachnik–Fields reaction by adding a mixture of aldehyde, triethyl phosphite, and diverse aminoalcools. The reaction studied at room temperature during a time between 10 and 15 min, using ultrasound irradiation. On the other hand, multicomponent reactions are economically viable, high convergence with high bond forming-index.

It was reported that these compounds showed bacteria growth inhibition and results of antimicrobial assays showed high activity against bacteria. These included Escherichia coli, Serratia marcescens, Enterobacter cloacae, Shigella dysenteriae, Salmonella enterica and Proteus vulgaris as Gram-negative bacteria, Bacillus subtilis and Staphylococcus aureus as Gram-positive bacteria. The structure of the obtained compounds was confirmed by \textsuperscript{1}H, \textsuperscript{13}C, and \textsuperscript{31}P NMR spectroscopy, IR spectroscopy, as well as elemental analysis.

Scheme 1. Synthesis of α-aminophosphonates.

Keywords: α-Aminophosphonates, three-component reaction, amino-alcohols, ultrasound.

References

Synthesis and Antioxidant Activity of Novel Quinoxaline Derivatives

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ABSTRACT

Quinoxalines have attracted attention as an important class of $N$-containing heterocyclic compounds in the field of drugs and pharmaceuticals because of their wide range of biological activities. In this work, we report the synthesis of novel quinoxaline derivatives by the condensation of maleimide with various substituted o-phenylenediamines and nucleobases (cytosine, adenine, and guanine). The synthesized compounds were evaluated for their \textit{in vitro} antioxidant activity against the DPPH and ABTS free radicals. The chemical structures of the newly synthesized compounds were confirmed by infrared spectroscopy (FT-IR), mass spectral analysis, proton ($^{1}$H), and carbon ($^{13}$C) nuclear magnetic resonance (NMR).

\textbf{Keywords:} Quinoxaline; Nitrogen heterocycles; o-phenylenediamines; antioxidant activity.
A Simple and Ecofriendly One-pot Synthesis of New 3-Cyano-2-Pyridone Derivatives.
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ABSTRACT

Heterocyclic compounds represent the largest and most diverse group of organic compounds and function in most scientific fields such as medicinal chemistry, biochemistry and other sciences[1]. Nitrogen heterocycles constitute more than half of organic compounds, which make them of great importance in scientific research for their applications in various fields[2] within this class 2-pyridone[3-4].

The 2-pyridone is one of the most widely used nitrogen-containing heterocyclic derivatives in various fields due to their structural properties and their biological and therapeutic activities[5], such as antibacterial[6], antibacterial[7], anticancer[8], antiviral[9]. The synthesis of 2-pyridone has become the main focus of organic chemists in recent years[10-11].

In this context, we are interested to the synthesis of 3-cyano-2-pyridone and its derivatives. This work describes a new One-pot synthesis to make these structures accessible in a simple and efficient manner under mild and environmentally friendly conditions.

Keywords: Nitrogen heterocycles; Organic synthesis; Multi-component synthesis; One-pot; 3-Cyano-2-Pyridone

References
Synthesis of new biologically active molecules via Betti reaction

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ABSTRACT

Over the next decade, pharmaceutical companies will need to increase their productivity by a factor of ten to meet growing demand for new drugs. Running multiple reactions in parallel is an obvious way to increase efficiency and maximize productivity. In this context, combinatorial chemistry has established itself as a fundamental source of original molecules. Among them, heterocycles represent more than 90% of the active ingredients [1]. α-Amidoalkyl-β-quinoline-8-ol are present in a multitude of biologically active compounds. They serve as intermediates for the preparation of various active ingredients with a wide range of applications [2]. 1-Aminoalkyl naphthol derivatives, for example, represent a large family of molecules with potential biological and pharmacological activities [3], antidepressants, antiarrhythmics [4], antihypertensives and Ca2+ calcium channel blockers [5].

In our work, the objective is to synthesize a new series of N-((7-hydroxyquinolin-6-yl)(m-tolyl)methyl)methanesulfonamide via the Betti reaction; It is carried out in the presence of 1 equivalent of quinoline-8-ol, 1.2 equivalent of sulfonamide and 1.2 equivalent of aromatic aldehyde in Ethanol. The nature of the aromatic aldehyde, of the substituent and its position on the aromatic ring significantly influences the speed and therefore the duration of the reaction. The reaction is illustrated in Scheme I, N-((7-hydroxyquinolin-6-yl)(m-tolyl)methyl)methanesulfonamide derivatives were synthesized in good to excellent yields.

Keywords: pharmaceutical, Betti, Quinoline-8-ol, heterocycles.

References

Synthesis and Characterization of Novel Fused-Pyrrole Derivatives as Potent Antibacterial and Antioxidant Agents

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ABSTRACT

In medicinal chemistry, nitrogen-containing heterocycles have biological interest as anticancer, antibacterial and antifungal agents. In the current study, a new series of pyrrole derivatives were synthesized by Hantzsch multicomponents reaction. The targeted products were obtained by condensation of sodium diethyl oxalacetate, α-bromoacetophenone and nitrogen nucleophile such as arylamine or nucleobases (adenine, guanine and cytosine), in different solvent EtOH or AcOH. The structures of newly synthesized compounds were elucidated by usual spectroscopic methods (IR, NMR and elemental analysis). In addition, all products were screened for their antibacterial activity by well plate method (zone of inhibition) and antioxidant activity against free radical DPPH.

Keywords: Pyrrole, Hantzsch reaction, Antibacterial activity, Antioxidant activity.

References

Investigation of industrial impregnated Y Zeolite acidity. Effect of metal loading.

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ABSTRACT

Zeolites are widely used as acid catalysts due to their Brønsted acid properties. In addition, their structure, ion exchange and adsorption ability give zeolite materials an efficient role in heterogeneous catalysis processes. Thus, it could be used as support for bi-functional supported catalysts where the metals impregnation on acidic support provides cracking and dehydrogenation-hydrogenation functions for the hydrocracking process. The effect of metal loading on industrial Y Zeolite acidity was investigated in this paper. The catalyst was prepared using the wet impregnation method in which various weights of Co and Mo metal salts were loaded onto an industrial Y Zeolite catalyst. The catalyst acidity was determined using the gravimetric method of pyridine adsorption. The obtained results showed that different metal concentration loading increases catalyst acidity, demonstrating a rise in the number of Brønsted and Lewis acid sites in the zeolite.

Keywords: Zeolite; Catalyst; Metal loading; Acidity.

References

Synthesis of a new complex derived from (E)-4-((2-hydroxybenzylidene) aminobenzenesulfonamide

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ABSTRACT

The chemistry of complexes has been the subject of several researches. Among them, that concerning the complexation of metal ions by organic molecules; Schiff bases. These ligands can be in the form of different types having coordinated sites of varying nature and defined as a set of chemical products comprising one or more imine groups. They are widely used in medicine for the treatment of several diseases,\textsuperscript{[1-2]} in biology and industry in the fight against corrosion\textsuperscript{[3-4]}. In this work, we have prepared a new complex by a green method from ligand complexation of (E)-4-((2-hydroxybenzylidene) amino)benzenesulfonamide and a transition metal (CuII), the complex was synthesized by the reaction of CuCl\textsubscript{2}.2H\textsubscript{2}O and the basis of schiff in the EtoH, the mixture was then brought under microwave irradiation for 4 minutes. The complex obtained in the form of a black powder with a good yield.

Keywords: schiff base, complex, CuCl\textsubscript{2}, microwave irradiation.

Schema 1. Complexation of (E)-4-((2-hydroxybenzylidene) aminobenzenesulfonamide

References


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Reactivity of ZnO material in Biginelli Synthesis

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ABSTRACT

The objective of this work is to study the catalytic system based on ZnO in the multicomponent reaction of Biginelli type for the synthesis of 3,4 dihydropyrimidin -2-(1H) one (DHPM) using benzaldehyde, ethyl acetoacetate and urea as reagents. The zinc oxide was prepare by sol-gel method and the structural and textural properties of the prepared catalysts were studied by thermogravimetric analysis (TGA), X-ray diffraction (XRD), Brunauer-Emmett-Teller (BET) specific surface area measurement, Barrett Joyner and Halenda BJH method, Scanning Electron Microscopy (SEM) coupled to (EDX). The effects of reaction time, reaction temperature, catalyst mass, and solvent effect on DHPM yields were evaluated. Promising results were obtained. Thus, the catalyst system prepared proved to be very active with yield 64% in DHPM. This yield in DHPM was obtained in the presence of the ZnO catalyst, tested without solvent with a reaction time of 2h, a temperature of 100°C and catalyst mass of 0.01g. The DHPM product obtained was characterized by NMR method (13C NMR, 1H, DEPT 135, DEPT 90, 2D NMR (HSQC)).

Keywords: Biginelli reaction, Heterogeneous catalysis, Zinc oxide.
Volumetric properties of binary and quaternary mixtures of 2,2,2-trifluoroethanol, 2-propanol, methanol, ethanol, acetone and water at Temperature 298.15K and Pressure 0.1 MPa

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ABSTRACT

The present work is dealing with the measurement and prediction of excess molar volumes $V_{m}^{E}$ of twelve binary and four quaternary systems containing of acetone, water, methanol, 1-hexanol, toluene, ethanol, 2-propanol and 2,2,2-trifluoroethanol at pressure 101 kPa and temperature 298.15 K. The mixtures used in this work were chosen because of their importance in the petroleum, safe new energy, perfume, and pharmaceutical industries [1].

The fluoro-hydrocarbons are also non-flammable and non-explosive and have low toxicity and short environmental life times [2]. The experimental excess molar volume of binary and quaternary system well fitted and predicted by various empirical equations. The experimental excess molar volume is a source of information about interactions between molecules [4-5]. The quaternary excess molar volumes are estimated from the binary excess molar volumes, and using the Colinet., Kohler and Muggianu’s equation [6-8] for prediction from experimental binary data.

Keywords: excess molar, quaternary system, binary, water, acetone

References

4. J. George, N.V. Sastry Measurements of densities, viscosities, speeds of sound and relative permittivities and excess molar volumes, excess isentropic compressibilities and deviations in relative permittivities and molar polarisations for dibutyl ether + benzene, + toluene and + p-xylene at different temperatures J. Chem. Thermodyn., 2003, 35, 1837-1853
5. Z. Atik Densities and excess molar volumes of binary and ternary mixtures of aqueous solutions of 2,2,2-trifluoroethanol with acetone and alcohols at the temperature of 298.15 K and pressure of 101 kPa J. Solution Chem., 2004, 33, 1447-1466
Evaluated of catalytical and antibacterial activities of Pd(II)- acetaminophen complex-based drug

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ABSTRACT:

Nowadays, the bioorganometallic chemistry of metal complexes and their medical applications have become a formidable field of investigation with promising results both in vitro and in vivo. In fact, research conducted in the living world has shown the important role that metal ions play in cellular machinery.

The complexation offers the metal ion a multitude of coordination possibilities and a wide range of geometries. In this work a complex of Pd(II) with acetaminophen drug was synthesized and characterized by elemental analysis, conductivity, UV–Vis, IR, 1HNMR and 13CNMR spectroscopy and thermal analysis. On the basis of all the data, the structure describing the chelate has been proposed. The Density Functional Theory (DFT) calculations were used to optimize the geometric structure of the ligand it metal complex in order to confirm the experimental results.

The metal complex has been tested for catalase-like activity in order to assess its catalytic properties. In vitro biological activity of the free ligand and its metal complex were screened against both of anti- bacterial and fungicidal activities. The results are encouraged.

Keywords: Palladium (II), acetaminophen, Complex, catalytic properties, Antimicrobial activity.
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Synthesis of Tetrahydrobenzo(a)Xanthen-11-ones with PPh3

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ABSTRACT

The multicomponent reactions have a great importance in the field of chemistry due to its various advantages. In fact, they help the researcher in gaining time, increasing the yield of reaction, respecting the environment …

Xanthene are produced with multicomponent reaction (MCR). Xanthene can be synthesised via many reactions and may have different biological activities.

In this study have synthesised the 12-aryl-8, 9, 10,12-tetrahydrobenzo[a]xanthene-11-one in the presence of PPh3 as a basic catalyst. The product was characterised with 1H and 13C NMR.

Schéma-1-

Keywords: 12-aryl-8, 9, 10, 12-tetrahydrobenzo[a]xanthene-11-one, xanthenes, Multi-coponent reaction, one pot reaction, basic catalyst PPh3

References

Synthesis of fused heterocyclic systems based on maleimide

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ABSTRACT
Maleimide 1 is a five-membered oxygen and nitrogen heterocycle, it is known to be a substrate for many heterocyclic syntheses and enters into the structure of a large number of biologically active molecules.

The synthesis of new products from structure 3 and 4 starting from maleimide and cyanoacetic acid hydrazide 2 as an intermediate 3. The structural study of the latter revealed a keto-enol tautomeric. These functional derivatives then served us as very effective reaction intermediates in the synthesis of products of 2-thioxo-imidazolidin-4-one 4.

Keywords: Maleimide; Cyanoacetic acid hydrazid; Thioxoimidazolidinone.

23
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Synthesis of new sulfonamide derivatives under microwave and ultrasonic irradiation

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**ABSTRACT**

Compounds containing the sulfonamide motif are extremely useful compounds in medicine, due to their antibacterial properties\textsuperscript{1}, carbon dioxide inhibitors\textsuperscript{2}, as diuretics. Indeed, the preparation of these compounds by green and environmentally friendly methods is a major challenge for organic chemistry research.

Within this framework, we apply the principles of green chemistry in the synthesis of new sulfonamide derivatives in order to prepare new molecules with biological activity.

The reaction was carried out in two successive stages, the first being the preparation of sulfonamide 3 by reacting tosyl chloride TS-Cl 1 and amine 2 in the microwave in the absence of the solvent and catalyst.

In the second stage, under ultrasonic irradiation, the prepared sulfonamide 3 will be condensed with two aldehydes 5 in order to obtain the desired products 6 with a good yield.

\textbf{Schéma 1} Synthèse de N-((2-aryl-1,3-dioxolan-4-yl) méthyl)-4méthylbenzènesulfonamide.

\textbf{Keywords}: sulfamide, antibactériennes, ultrasonic, microwave

\textbf{References}:


Anti-inflammatory Activity of ferrocene derivative Using a Spectroscopic Approach and Molecular Docking

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ABSTRACT

Inflammation is a complex, dynamic response to cell injury, infection, trauma, or toxins that can last for a few days (acute inflammation) or for a longer duration (chronic inflammation). However, uncontrolled inflammatory processes are the root cause of a wide range of human illnesses, including cancer, diabetes, arthritis, bowel, cardiovascular, and brain disorders. Ferrocene derivatives has attracted significant interest as potent biological activities against several diseases. The objective of the current study is to understand and establish the role of Ferrocene derivative in the treatment of inflammatory condition, through in-silico and in-vitro studies. The specificity and binding affinity of FCMA were evaluated using molecular docking. Through in-silico and in-vitro studies, the current study aims to comprehend and establish the role of Ferrocene derivative in the treatment of inflammatory conditions. In silico docking method, the research was conducted using chemical compound FcMA and model of protein BSA downloaded via Protein Data Bank (PDB), then performed docking process using the AutoDock Tools 1.5.7 program, and Prediction done of the physicochemical, pharmacokinetic, and toxicological property of the FcMA compound. In vitro method, synthesis of FcMA compound, and a study of the Interactions between him and bovine serum albumin (BSA) was carried out. He results show that these ferrocene derivatives have an electrostatic interaction with the BSA, the IC50 value showed a very significant activity by comparing them with Diclofenac. Overall results suggest that Ferrocene derivative mediates its anti-inflammatory activity by its direct effect on BSA. FcMA can be a potent molecule in treatment of various diseases associated with inflammation.

Keywords: Ferrocenylmethyl aniline, BSA, anti-inflammatory activity, Docking

References


DFT studies on Geometric, vibrational and electronic spectra, HOMO–LUMO of N-ferrocenylmethylaniline.

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ABSTRACT

Quantum chemistry methods play an important role in obtaining molecular geometries and predicting various properties. To obtain highly accurate geometrical and physical properties for molecules, in this work, Density functional theory (DFT) calculations using Becke-3-Parameter-Lee-Yang-Parr (B3LYP) in 6-311G\textsuperscript{++}(d,p) basis set, using Gaussian 09 program package were performed to obtain optimized geometries of a Ferrocenic derivative. Geometrical properties such as Mulliken atomic charges, the molecular electrostatic potential (MEP), bond angles and bond lengths of the optimized crystal structure were carried out by mentioned method in the gas phase.

In addition, the vibrational and electronic spectra have been carried out, and these spectra results obtained were compared with the obtained from the experimental methods. Moreover, the lowest occupied molecular orbital energies (HOMO), lowest unoccupied molecular orbital energies (LUMO), and "gap HOMO-LUMO" characterizes molecular chemical stability energies are calculated to study the molecular chemical stability. s built and optimized at the level of density functional theory DFT with DFT/B3LYP method combined with 6-311++G(d,p) basis set using Gaussian 09 program package. The crystal structures of both DNA (PDB ID: 1W0T) and BSA (PDB ID: 3V03) were imported to the AutoDock molecular docking software. The docking analyses confirm the formation of the adducts.

Keywords: Density functional theory; HOMO; LUMO; Ferrocenique derivative.

References

Étude in vitro et in silico de l’activité antidiabétique d’un dérivé ferrocénique 'FMA'

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Résumé

Le diabète est un trouble métabolique chronique causé par des carences en insuline. Le trouble est associé à des complications graves et à long terme y compris les maladies rénales. Pour gérer efficacement le diabète, il est recommandé de maintenir un mode de vie sain avec une alimentation saine et l’activité physique ainsi que d’utiliser des médicaments lorsque nécessaire. Il a été démontré que l’inhibition de l’\(\alpha\)-amylase peut retarder l’absorption des glucides et ainsi réduire la glycémie, l’utilisation de l’inhibiteur de l’amylase sera bénéfique pour les personnes à risque accru de développer des symptômes d’hyperglycémie, toutefois, d’autres recherches sont nécessaires pour déterminer l’innocuité et l’efficacité de ce traitement.

L’objet de cette étude était d’étudier le dérivé ferrocénique possibles du composé FMA sur l’inhibition de l’\(\alpha\)-amylase. Sur la méthode d’amarrage dans le in-silico, la recherche a été menée en utilisant le composé chimique FMA et un modèle de \(\alpha\)-amylase protéine téléchargée via la banque de données de protéines (code PDB : 4GQR) puis effectué l’amarrage en utilisant programme AutoDock 1.5.7 instruments. Installation in vitro de composés FMA et évaluation de l’efficacité pour inhiber l’\(\alpha\)-amylase. Les résultats obtenus ont montré que les dérivés ferrocéniques avaient une réaction électrostatique avec l’enzyme, et donc la valeur de la CI50 a montré une activité inhibitrice très importante en les comparant à l’acarbose. L’analyse de l’arrimage in-silico contre \(\alpha\)-amylase a révélé que les scores d’arrimage correspondent étroitement aux valeurs IC50 des inhibiteurs obtenus en laboratoire.

Les résultats obtenus pour le composé FMA étudié ont indiqué une excellente activité inhibitrice à la fois en laboratoire et dans les in-silico indiquant son rôle important dans l’inhibition \(\alpha\)-amylase.

Mots clés : dérivé ferrocénique, in-silico, \(\alpha\)-amylase, anti-diabétique, l’enzyme.

Références :


T2: Photochemistry, Photobiology, and Electrochemistry
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Electrochemical experiments and superoxide anion scavenging assays were used to examine the antioxidant capacity of Moringa Oleifera flowers collected from the Algerian Sahara.

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ABSTRACT

Tropical plant belonging to the family Moringaceae named \textit{Moringa Oleifera}, \textit{also known as the “Tree of Life”} grows in tropical and subtropical country. Is among the most commonly cultivated plant all over the world, it has high economic impact due to the medicinal and nutritional values\textsuperscript{1,2}.

This study aimed to extract of phenolic compounds and to evaluate antioxidant propriety of \textit{Moringa Oleifera} flowers extracts grown in Algeria, and to find the correlation of antioxidant propriety by electrochemical assays with antioxidant propriety by superoxide anion scavenging assays. The dried powdered Flowers of \textit{Moringa Oleifera} was macerated with hydro-alcoholic solution and partitioned successively with Chloroform, Ethyl acetate and n-Butanol\textsuperscript{3}. Total phenolics (TP) and total flavonoids (TF) content were determined by spectrophotometric method\textsuperscript{3,4}, the plant extracts were also examined for its antioxidant propriety by using cyclic voltammetry\textsuperscript{5} assay and superoxide anion scavenging assays\textsuperscript{6}. These results showed that ethyl acetate extract had the highest inhibition value for superoxide anion scavenging assays and showed the best IC\textsubscript{50} value for antioxidant activity by cyclic voltammetry assay the results also showed that there are positive correlations.

As a summary of this study, the Flowers of \textit{Moringa Oleifera} are the rich source of phenolic compounds that can play an important role in preventing the progression of many diseases.

\textbf{Keywords}: \textit{Moringa Oleifera}; phenolic content; flavonoid content; cyclic voltammetry; superoxide anion.

References

The effect of Citrus Paradisi Essential Oil in HeLa and MCF-7 tumor cells

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ABSTRACT

The present study was focused on the study of essential oil extraction from the zest of grapefruit (Citrus paradisi) and the determination of antioxidant and antitumor activities in HeLa and MCF-7 tumor cells. Grapefruit essential oil was extracted by hydro distillation. The cytotoxicity study of grapefruit essential oil was assessed using MTT assay against HeLa and MCF-7 tumor cells. Grapefruit essential oil was analyzed for antioxidant potential. Lipid peroxidation was determined in a biological system (cell culture), by measuring the levels of MDA and DC in HeLa and MCF7 cell line after H₂O₂ treatment.

The extraction yield obtained after optimization was 1.32 %. In addition, a significant antitumor effect of grapefruit essential oil was observed in HeLa and MCF-7 tumor cells. An antioxidant activity was observed in both HeLa and MCF-7 tumor cells. The data serve as the basis for the consumption of Citrus paradisi essential oil, with significant antioxidant activity and with antitumor potential.

Keywords: Citrus Paradisi; Essential Oil; Antioxidant Activity; Antitumor Activity; MTT; HeLa; MCF-7.
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Nigella Sativa Paste extract as green corrosion inhibitor for aluminum in 1M HCl

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Abstract

The Nigella Sativa Paste (NSP) brought from Istanbul (Turkey), was the subject of our study. The aim is to highlight its triple action, namely: its inhibiting efficiency on the corrosion of aluminum in 1M HCl, its biocide effect and its valorization as waste. The Nigella Sativa Paste Extract (NSPE) was obtained by maceration of the NSP for 24 h in 1N HCl. This study was conducted by Weight Loss (WL), Electrochemical studies (Potentiodynamic Polarization (PPD)), Electrochemical Impedance Spectroscopy (EIS) and Linear Polarization Resistance (LRP). The characterization of the inhibitor was performed by FTIR, UV-visible and photochemical screening. Microscopic characterizations of the surface state of aluminum by SEM-EDS and AFM. The biocidal effect of NSP was tested on E.coli bacteria. The WL results obtained at concentrations (1.10^{-2}, 2.10^{-2}, 3.10^{-2} and 4.10^{-2}) v/v NSP show that increasing the concentration increases the inhibitory efficiency up to 99.2% at 4.10^{-2} v/v NSP, after 2h immersion time. The results obtained by PDP, EIS and LRP, gave maximum inhibitory efficiencies of 99.88%, 98.94% and 95.99% at 4.10^{-2} v/v NSP respectively. The latter acts as a mixed inhibitor with predominantly cathodic. Nyquists are characterized by a high frequency charge transfer phenomenon, followed by a low frequency induction phenomenon. SEM-EDS and AFM characterizations of the aluminum surface condition confirm the results obtained by the study methods. The results obtained by the biocide effect show that NSP is an effective biocide against Escherichia coli. We can therefore conclude that Nigella Sativa Paste is a good inhibitor of aluminum corrosion in 1M HCl and a good biocide agent.

Keywords: Nigella Sativa paste; Corrosion; Inhibitor; Aluminum; E.coli; Biocide.
Study of the influence of temperature on the inhibitory effect of Borago officinalis against the corrosion of an mild steel

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ABSTRACT

Corrosion of materials is done by physico-chemical interactions with their environment, resulting in changes to the properties of the metal often accompanied by a functional degradation of the latter.[1] Synthetic inhibitors are used to reduce the rate of corrosion, but they are harmful and too expensive.[2] Green inhibitors have been able to replace them[3], several parts of plants have been used: grains, leaves, flowers, stems, roots.[4] The objectif of our work is to study the inhibitory effectiveness of the Borago officinalis (B.O) plant on the corrosion of the mild steel A9M in sulphuric acid at 1M, at different temperatures 25 ; 35 ; 45 and 55°C, by weight loss method. Borago officinalis is an annual herb native to the Mediterranean and cultivated for medicinal and culinary purposes. [5] The research has shown its wealth in linoleic acid and gamma-linoleic acid, which help to prevent and treat various diseases mainly diabetes and cancer. [6] The extract from the leaves of Borago officinalis was obtained by decoction and then extraction by soxhlet in the presence of ethanol as a solvent. The spectroscopic characterisation of the leaves of Borago officinalis was done by FTIR and UV-vis spectroscopy. The maximum inhibitory effectiveness of (B.O) is 91% to 8.10-1 (v/v) obtained after 24 hours of immersion at 55°C. We can therefore conclude that the leaves of Borago officinalis is a good corrosion inhibitor of A9M steel.

Keywords: corrosion; inhibitor; Borago officinalis; A9M steel; H₂SO₄.

References

2. Nayem Hossain and Mohamman Asaduzzaman Terminalia Arjuna Leaves extract as green corrosion inhibitor for mild steel in HCl solution 2022.
3. Walid Daoudi and Abdel malik el Aatiaoui, Essential oil of Dysphania ambrosioides as green corrosion inhibitor for mild steel in HCl solution-journal of molecular liquids 2022.
Molecular Design Based on ab-initio Calculations of an Organic Molecule for Corrosion Protection

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ABSTRACT

Recently, the protection of vulnerable industrial and strategic structures against corrosion by chemical means uses organic inhibitors to avoid the use of harmful inhibitors based on non-organic substances that can harm the environment. Corrosion protection in energy transport is facing various challenges due to its multidimensional basic’s phenomenon, which make it, on various aspects very demanding to control. The experimental approaches used for the synthesis and the development of novel inhibitors is time consuming and needs a considerable budget till reaching the objective. Recent advances in robust numerical calculations can be used to reduce time and cost for the development of various corrosion inhibitors [1,2]. The use of quantum mechanical method based on the Density Functional Theory (DFT) aided numerical simulations techniques as a support approach for organic corrosion inhibitors synthesis is a complementary and a reliable way to strongly connect the experimental and theoretical research work. Indeed, methods based on DFT have a significant predictive potential for the design at the molecular level of target functionalities as a support, for the development and synthesis of inhibitors by an experimental route at a lower cost [3,4]. Among the inhibitors used in industry, there are organophosphorus compounds; phosphonates characterized by the presence of a -C-PO3-H2 group. Our interest in this study concerns molecules derived from phosphonates, to set up a calculation method based on the Density Functional Theory (DFT) to describe the energy parameters (HOMO, LUMO, energy gap ΔE, ionization potential P, electronic affinity A, electronegativity χ, hardness η and the number of transferred electrons Δn, in order to find the suitable parameters to model the experimental inhibitory efficiency.

Keywords: Organic Inhibitors, Numerical Calculations, Corrosion Inhibition Efficiency.

References

The study of the corrosion of a Polyaniline-based coating doped in a 3.5% NaCl solution

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ABSTRACT

In the concern encountered in the oil storage tanks in the southern basin of Algeria (Hassi Messaoud), in order to ensure a long lifespan under exposure to the aggressiveness of saline and acidic environments, we proceeded to the preparation and development of new paints that can improve anti-corrosion behaviour by spraying epoxy with semi-conducting polymer anti-corrosion agent.

In our study, we proceeded to the development of an epoxy coating with an acid-doped Polyaniline type anti-corrosion agent. Deposits of the order of a micro-meter (40 to 80 μm) were made, projected onto metallic substrates (carbon steel). Thanks to this surface treatment (coating), we bring to the surface, which is in contact with saline environments, a power to resist the activity of corrosive substances (Cl- and H3O+ ions) and ensure better protection sought \cite{1}.

The acid-doped PANI polymer is of the same family as polypyrrole (PPy), polythiophene (PTh), polyacetylene (PA), it is also considered as an N-type semiconductor polymer \cite{3}.

In order to understand the behavior of our new paint in saline environments, we tried to stimulate a study of the phenomenon of corrosion in a medium of 3.5% NaCl with different pH such as 6.5 \cite{1, 2} and pH 4.5.

Finally, to understand the fundamental mechanisms of our coating compared to another coating already developed and marketed \cite{1, 2}, we use a few characterizations such as:

- Electrochemistry (OCP, LPR, EIS and Tafel curve)
- FTIR-ATR
- SEM

From the results of its physic-chemical characterizations, we can see that our coating based on acid-doped Polyaniline represents a strong resistance to corrosion \cite{2}.

Keywords: Polymer coating Polyaniline, Anti-corrosion paints, Conductive, epoxy

References

\cite{1} Yanhua Lei, Zhichao Qiu, Ning Tan, Hailiang Du, Dongdong Li, Jingrong Liu, Tao Liu, Weiguo Zhang, Xueling Chang, Progress in Organic Coatings \textbf{Vol 139} (2020).
Characterization and Electrocatalytic Properties of Ni doped Perovskite Oxide

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ABSTRACT

Perovskite-type rare earth compound oxides such as ABO\textsubscript{3} are very important inorganic functional materials to solve the questions of energy shortage and environment pollution.

In this study, the perovskite NdFe\textsubscript{1-x}Ni\textsubscript{x}O\textsubscript{3} was synthetized through the sol-gel method and their electro -catalytic activity towards O\textsubscript{2} -evolution reaction by doping the B-site by nickel was investigated. X-ray diffraction (XRD), thermogravimetric and differential thermal analysis (TG/DTA), Fourier transform infrared spectroscopy (FTIR), scanning electron microscopy (SEM) and electrochemical measurements, were used to characterize the structure, morphology and electrocatalytic activity of the prepared catalysts. According XRD characterization, the formation of pure perovskite was obtained at 800°C in the range 0 \leq x \leq 0.3. The FTIR spectra confirm the presence of metal oxygen bond of Fe-O in the FeO\textsubscript{6} octahedra. Scanning electron microscopy show that the particles are nearly spherical in shape and the powders are partially agglomerated. Electro chemical measurement indicate that the catalytic activity is influenced by nickel substitution.

Keywords: electro -catalytic activity; O\textsubscript{2} -evolution reaction; perovskite.
Synthesis, Characterization and photocatalytic activity of ZnO thin films under UV and Solar Light

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ABSTRACT

Photocatalysis stands as part of the advanced oxidation techniques [1]. It is based on the light-enhanced generation of highly reactive hydroxyl radicals, which oxidize organic matter in solution and convert it completely into water and inorganic compounds. ZnO is one of the most important transition metal oxides used in the photocatalytic processes to remove organic pollutants from the environment thanks to its low cost and good catalytic properties [2]. In the present study, ZnO thin films on glass substrate were successfully synthesized via sol-gel dip coating technique. It is noteworthy to mention that these nanoparticles were heated via an optical annealing using (UV lamp, 24 W) at different time intervals of UV irradiation (2, 4, 6 and 8 hours). Results showed that the band gap of ZnO thin films increases from 3.19 to 3.23 eV for films irradiated within 2 to 8 h. This outcome proved that the optical band gap of the ZnO thin films strongly depends on the optical annealing time. The synthesized ZnO thin films that undergo 2 hours of optical annealing present the smallest crystallite size, the smallest band gap energy and the greater surface area compared to the others thin films. These arguments make these films the best candidate for our study. The estimation of the photocatalytic activity of the prepared films was investigated using Methylene Blue dye as an organic pollutant model under UV light and solar irradiation. The excellent photocatalytic efficiency of the elaborated nanoparticles was well interpreted via the MB disappearance kinetic that clearly demonstrates the complete MB degradation after only 50 min in the presence of Solar light against 125 min under UV light.

Keywords: photocatalytic, ZnO, films, Photocatalytic Activity

References

ABSTRACT

The valorization of natural resources, especially the medicinal plant wealth, and their inclusion in the therapeutic field and its applications is still an urgent necessity, in light of the challenges the world faces today in finding alternative methods for manufacturing chemical medicines. Medicinal plants have been used since the beginning of human activity in treating various diseases and ailments in their daily practices. Among these plants, the genus *Euphorbia* is one of the richest in medicinal plants, especially the milk of the plant "milk juice", which is widely known as latex as a medicine for many diseases.

Traditional folk medicine used plant latex to treat a number of ailments, including skin diseases such as warts, eczema, skin infections, chronic wounds, intestinal parasites, treatment of infections, arthritis, stomach pain and diabetes.

This mini-review aims to provide an update on the traditional medicinal uses of latex. Thus, it can be said that latex may constitute a natural resource with interesting pharmacological properties, and qualitative properties in the treatment of many human diseases (including inflammatory diseases, bacterial infections and skin diseases); It can also be introduced into pharmacology, mainly in the synthesis of new drugs with a natural essence for the treatment of many diseases and the development of some drugs and medicines for the same effect.

Therefore, more prospective studies are needed to improve the therapeutic use of latex extracts in a more precise manner to achieve the desired therapeutic efficacy.

**Keywords:** Plant Latex; *Euphorbia*; Traditional Applications; Therapeutic uses.
Photocatalytic study of synthesized TiO$_2$ by sol-gel process

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ABSTRACT

In the photovoltaic industry, the evacuation of water specifically used in wafers production, which include silicon crystal growth, cutting, metallization, photolithography, washing and cleaning [1-3] generates huge quantities of wastewater with considerable concentrations of heavy metals such as hexavalent chromium TiO$_2$ that is considered as a metallic element released in significant quantities in the effluents of this industry, which has harmful consequences on human health and environment [4,5]. Heterogeneous photocatalysis is one of the innovative advanced oxidation processes used in the reduction of most of these metallic pollutants. Due to its different structural properties and low cost, titanium dioxide is the most widely used photochemical catalyst in wastewater treatment processes [6,7]. During this study, we synthesized TiO$_2$ by the sol-gel process. The obtained TiO$_2$ powder was characterized by various characterization techniques. The photocatalytic activity of the synthesized photocatalyst was tested by studying the reduction of hexavalent chromium Cr(VI) under UV light.

Keywords: Photocatalysis; wastewater; TiO$_2$; hexavalent chromium; sol-gel.

References

Investigation of the antioxidant and anti-diabetic activity in vitro of Moringa Oleifera flowers extracts from Algerian Saharan.

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ABSTRACT

\textit{Moringa Oleifera} tree described as among the most amazing plants is a rich of proteins, vitamins and minerals including potassium, calcium, phosphorus, iron, folic acid in addition to carotene. Its flowers include nectar and are a good source of pollen. They also contain sucrose, d-glucose and some flavonoids inclusive of quercetin, in addition to nine amino acids and some alkaloids and are wealthy in calcium and potassium\textsuperscript{1,2}.

The aim of the present study was to extract of phenolic compounds from \textit{Moringa Oleifera} Flowers grown in Algerian Sahara were optimized using different solvents\textsuperscript{3}. Total phenolics (TP), total tannins (TT) and total flavonoids (TF) content were determined by spectrophotometric method\textsuperscript{4,5,6}. Standard antioxidant methods including DPPH scavenging, Phosphomolybdenum assay (PM) and Ferric reducing power assay (FRAP) were used to evaluate the activity of each extract\textsuperscript{7}.while the anti-diabetic activity was studied for \(\alpha\)-Amylase inhibition using an in vitro model. Results demonstrated that total phenolics varied between 95,50 ± 0,42 and 10, 49 ± 0,053 mg GAE/g WE, while total flavonoids was between 17,00 ± 0, 011 and 2,47 ± 0,014 mg GAE/g WE, In this study total tannins ranged between 2,96± 0,016 and 1,30± 0, 014 mg GAE/g WE. All capacities of DPPH radical scavenging, Phosphomolybdenum (PM) and Ferric reducing power (FRAP) were found best in ethyl acetate extract (IC\textsubscript{50}= 0,159± 0,004mg/ml, AEAC = 42.37 ± 0.28 mM and AEAC =104.05±0.41 mM respectively). Add to this extract showed the highest \(\alpha\)-amylase inhibitory activity (I= 38, 92 %).

\textbf{Keywords:} Moringa Oleifera; flowers; phenolic compounds; Antioxidant; \(\alpha\)-amylase enzyme.

References

7. M Belguidoum, H Dendougui, Z Kendour, B Assia, B Cheyima, M Hadjadj Der Pharma Chemica 7, 312-31
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Antioxidant and Antibacterial Capacity Assessment of *Helianthemum lippii* Extract and silver nanoparticles

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ABSTRACT

Medicinal plants are both a finished product intended for consumption and raw material for obtaining the bioactive substances which are at the origin of several modern medicines thanks to their richness in secondary metabolites, in particular in phenolic compounds endowed with beneficial biological. The synthesis and characterization of noble metal nanoparticles such as silver, gold and platinum is an emerging field of research due to their important applications in the fields of biotechnology, bioengineering, textile engineering, water treatment, metal-based consumer products and other areas, electronic, magnetic, optoelectronics, and information storage.

This study was designed to determine the antioxidant and antibacterial capacity of *H. lippii* plant and silver nanoparticles in vitro. Has been used the DPPH, Reduction Power (RP) tests and the effectiveness of AgNPs and *H. lippii* against three bacterial strains was also tested. The results indicated an efficient antibacterial action and *H. lippii* and AgNPs demonstrated strong efficiency as antioxidant. Hence Biosynthesized silver nanoparticles and *H. lippii* have strong antioxidant capacity which may be used to treat a range of oxidative stress-related diseases and in other hand may be employed in the treatment of other illnesses brought on by bacteria.

Keywords: Medicinal plants; *Helianthemum lippii* L; Silver nanoparticles; antioxidant activity; antibacterial activity

References

Butanolic Extract of *Moringa Oleifera* leaves from Algerian Sahara as Corrosion Inhibitor of 6063 Aluminium Alloy in 1 M Hydrochloric Acid Medium

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ABSTRACT

This paper presents an evaluation of inhibitory action of Butanolic extract of *Moringa Oleifera* leaves (n-But Feu) from Algerian Sahara on the corrosion of 6063 aluminum alloy in 1 M HCl solution has been investigated by weight loss 1,2, potentiodynamic polarization 3 and electrical impedance spectroscopy technique 4. The efficiency was found to increase with increasing concentration of the plant extract in weight loss method. The results obtained showed the Butanolic extract of *Moringa Oleifera* leaves (n-But Feu) could serve as an effective inhibitor for the corrosion of 6063 aluminum alloy in hydrochloric acid solution, 84.13% is the maximum inhibition efficiency obtained from potentiodynamic polarization technique and 75.33% is the maximum inhibition efficiency obtained from electrical impedance spectroscopy with 150 ppm of the this extract at 25°C. As a summary of this study, the butanolic extract of *Moringa Oleifera* leaves (n-But Feu) was found to inhibit the corrosion of aluminum alloy 6063 in 1 M hydrochloric acid solution. The inhibition efficiency increases with the increase in the concentration of the butanolic extract.

Keywords: *Moringa Oleifera*; Butanolic extract; 6063 aluminum; corrosion.

References

Antimicrobial activity of MeOH extract of *Bassia Muricata* against pathogenic bacteria

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**ABSTRACT**

**Description of the subject:** The present study verifies the biological efficiency of *Bassia muricata* (Chenopodiaceae vent), a wild plant in the Algerian desert.

**Objectives:** The MeOH extract (70%) of the aerial parts of *B. muricata* was tested for antibacterial activities, in addition to verifying its phenolic content by quantitative determination and FT-IR analysis.

**Methods:** The antibacterial activity of MeOH extract (70%) from aerial parts of *B. muricata* was tested against six bacterial strains including three gram-negative and three gram-positive strains. The test was done by determining the inhibition diameter using the disc diffusion method, and the MIC value was also determined using the broth dilution method.

**Results and discussion:** The MeOH extract of *B. muricata* showed significantly antibacterial activity against *B. subtilis* and *L. innocua*, *S. aureus*, *E. coli*, and *P. aeruginosa*. It has not given efficacy against *S. typhimurium*.

**Conclusion:** These results demonstrated that *B. muricata* could be useful as a source of bioactive compounds for the food, pharmaceutical and cosmetic industry.

**Keywords:** MeOH extract, *Bassia muricata*, Antibacterial activity.

**References**

Synthesis and characterization of graphene by electrochemical exfoliation of rod graphite

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ABSTRACT

Electrochemical exfoliation is a promising method for producing graphene from graphite. This study explains how to make graphene from battery graphite rods that have been electrically exfoliated. While electrochemical exfoliation of graphite can now be used to produce reduced graphene oxide (RGO) with ease. In the electrochemical reaction, graphite served as the working electrode and platinum served as the counter electrode. The two electrodes were then exposed to a Na2SO4 solution. The electrochemical exfoliation procedure started when a positive voltage of 10 V was applied to the system. Purified graphene was examined using SEM, Fourier transform infrared spectroscopy, and X-ray diffraction. This is the recently advertised process for creating materials for power sources that use graphite rods for batteries.

Keywords: Electrochemical exfoliation; graphite rods; graphene; working electrode; counter electrode.

References

The First International Seminar on Catalysis, Chemical Engineering & Green Chemistry

The biological activity of the ethanolic extract of Neurreada procumbens L.

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ABSTRACT

This study aimed to examine the antioxidant effect of Neurada procumbens L. ethanolic extract. The chemical screening revealed the presence of tannins, flavonoids, sterols, and terpenes compounds. The extract yield was 12.33 and 8.10% for the leaves and fruits, respectively. The polyphenols were 3.25 ± 0.0127 and 3.66 ± 0.286 (mg AGE/g EX) and the flavonoids were 0.27 ± 0.011 and 0.30 ± 0.025 (mg AGE/g EX), concerning the condensed tannin was 28.43 ± 13.412 and 29.34 ± 2.502 (mg AGE/g EX) for the leaves and fruits, respectively.

The antioxidant activity using the DPPH, the results showed that the inhibition reached 90% at the concentration 100 μg/ml leaves and fruits. The IC50 was 19.389 and 19.380 μg/ml for the leaves and fruits, respectively. The human erythrocytes were exposed in a dose-dependent manner to various ethanolic plant extracts, the blood hemolysis protect reached to was 82% and 70% for the leaves and fruits, respectively.

Keywords: Neurada procumbens L, polyphenols, flavonoids, tannins, DPPH, Hemolysis test

References

1. Abirami a., gunasekaran n., & perumal s., 2014- In vitro antioxidant, anti-diabetic, cholinesterase and tyrosine inhibitory potential of fresh juice from Citrus hystrix and C. maxima fruits. Food Science and Human Wellness,(03)18-22
2. Albrecht.d.e, bark er r.m, bark er w.r, GAVINJ.,2002-Neurada procumbens L .(Neuradaceae): a new record for australia’s sandy deserts, journal plant protection quarterly,17(4):158-161.
4. Chelalba i., Benchikha N., Begga s., Messaoudi m., debche h., Rebiai a.,...2020- Phytochemical composition and biological activity of Neurada procumbens L. growing in southern Algeria, Journal of Food Processing and Preservation,
Electrochemical elaboration and characterization of polybithiophene/ZnO composite material for solar cells application

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ABSTRACT

Polybithiophen/ZnO composite thin films were prepared via an electrochemical synthesis route on ITO coated glass substrates. ZnO particles were uniformly dispersed in to the polybithiophene matrix. Interaction between ZnO particle and polybithiophene has been studied using cyclic voltammetry and electrochemical impedance spectroscopy (EIS) as well as photoelectrochemical in an organic solution without monomer.

The resulting hybrid films PBTh/ZnO particles are verified by scanning electron microscopy (SEM), X-ray energy dispersive spectroscopy (EDS), X-ray diffraction (XRD) and UV spectrometry (Uv-Vis), and I-V characteristics.

In this letter, we propose that this prepared film is effective for solar cells application.

Keywords: polybithiophene, ZnO particles, electrodeposition, electrochemical, solar cells
Antioxidant activity and phenolic compounds of Algerian *Teucrium polium* L. Medicinal plant used traditionally for treatment of digestive system disorders

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**ABSTRACT**

This work aims to characterize antioxidant activity of Algerian *Teucrium polium* L., traditional medicinal plant, where this research is part of the study of aromatic medicinal plants in Algeria and their effectiveness [1–3]. We extracted the essential oils and the crude extract of *T. polium*. The samples were collected from High Plains of Algeria in April 2019. We used hydro-distillation (HD) to extract essential oils (EO) from air part of *T. polium*. The yield was 0.05% (v / w). The crude compounds were extracted by soaking (methanol / water (8 / 2)) and the yield was 20.45% (w / w). The amount of phenol (TPC) and flavonoids (TFC) of the crude extract was estimated. We found TPC = 38 (mg EAG/g EX) and TFC = 23.7 (mg RuE/g EX), respectively. The antioxidant activity of EO (HD) was evaluated by DPPH method, we found IC50 = 54.91 (mg/ml) with IC50 = 27 (µg/ml) for Vit-E reference compound. Also found IC50 = 373.45 (µg/ml) in ABTS method with IC50 = 37.79 (µg/ml) for Vit-E reference compound. As for the crude extract, we have found IC50 = 8.68 (µg/ml) in DPPH method with IC50 = 15.81 (µg/ml) of the Vit-E reference compound. From experimental results, we can consider the *Teucrium polium* L., a source of potent natural antioxidants[4].

**Keywords:** antioxidant activity; phenol; flavonoids; ABTS; DPPH; medicinal plant.

**References**

Development, characterization and application of efficient electrocatalysts in fuel cells

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ABSTRACT

It is well-known that fossil fuel reserves are rapidly depleted with the progressive demand for energy. At the same time, the environmental impacts related to their use, which are directly linked to the problem of climate change and the emission of greenhouse gases, make the task of searching for a viable alternative fuel and develop new energy conversion devices both essential and urgent. In fact, one of the promising alternatives envisaged is biodiesel, a biodegradable, green and non-toxic fuel. Currently, biodiesel is mainly produced through the transesterification of animal fats or vegetable oils, yielding 10% by weight of crude glycerol as a by-product. Although glycerol is used as a feedstock in the food, polymer, cosmetic and pharmaceutical industries, its production is still much higher than its global demand. Clean electrochemical technologies have proven to be a very interesting way to diversify the uses of surplus glycerol in the biodiesel industry due to their versatility, simplicity and low cost. Among the electrochemical configurations used for the valorization of glycerol, there is the "fuel cell" which can generate both high value compounds and electrical energy by the oxidation of glycerol at the anode and the reduction of oxygen at the cathode. In this context, we are interested in developing efficient, low cost and naturally available non-noble metal based electrocatalysts for application in fuel cells using glycerol as fuel. Different experimental techniques are used: electrochemical (cyclic voltammetry, chronamperometry, etc.), and physicochemical such as Scanning Electron Microscopy, X-ray Diffraction, Energy Dispersive X-ray Spectroscopy, etc.

Keywords: valorisation; glycerol; electro-oxidation; electrocatalysis.

References


47
Total phenolic content, antioxidant and anti-Inflammatory of Unripe Fruit of *Pistacia atlantica* aqueous extract

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ABSTRACT

*Pistacia Atlantica* in folk medicine is used by traditional healers from Algeria for treating a wide variety of diseases and conditions including dyspepsia, digestive problems, peptic ulcer, and especially inflammatory diseases [1, 2]. The aim of the present study was to assess the phytochemical composition, in vitro antioxidant activities (using a method, 2,2-diphenyl-1-picrylhydrazyl (DPPH•)), and in vivo anti-inflammatory of the unripe fruit extracts of *Pistacia atlantica* from different parts of Djelfa regions of Algeria. According to the findings, various aqueous extracts exhibited significant antioxidant activities. The result obtained, revealed significant anti-inflammatory activities. Data generated would be a valuable source of information for the pharmaceutical industry and medical research. These results suggest that unripe fruit of *Pistacia atlantica* extracts have the potential to be utilized across a wide range of contexts as an agent with multifunctional uses, as well as a natural remedy for other physiological diseases [3, 4].

**Keywords:** *Pistacia atlantica*; Unripe fruit; Antioxidant activity; total phenol; anti-inflammatory

References

4. Belyagoubi L, Belyagoubi-Benhmou N, Atik-Bekkara F, Coustard JM (2016) Effects of extraction solvents on phenolic content and antioxidant properties of *Pistacia atlantica* Desf fruits from Algeria. Int Food Res J 23:
Electrodeposition of ZnO/FTO layers from solutions with different concentrations of zinc precursor: Characterization and photocatalytic tests.

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ABSTRACT:

ZnO films from solutions with different concentration of zinc precursor were deposited on fluorine-doped tin oxide (FTO) substrates, electrochemically using the chronoamperometry technique at a temperature of 70°C. Characterization by the X-ray diffraction (XRD) method revealed the hexagonal crystal structure of Würtzite type for all the films with a preferential orientation along the (002) axis [1]. The morphology of the deposits was studied by the scanning electron microscope; there we can see nanometric rods of hexagonal shape perpendicular to the c axis, which confirmed the result obtained by the XRD method. The photoelectrochemical performance was evaluated in a three-electrode electrochemical cell driven by a potentiostat-galvanostat using K\textsubscript{2}SO\textsubscript{4} 0.1M as supporting electrolyte, this method showed the photo-active character of an n-type semiconductor for all films.

Solar photocatalysis tests on brilliant blue have given encouraging results for certain films.

Keywords: zinc oxide, precursor solution, electrodeposition, photocatalysis.

References

Phytochemistry and antibacterial activity of essential oils from the leaves of Juniperus oxycedrus ssp, at the fruiting stage, growing in Oum El Bouaghi (semi-arid zone).

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ABSTRACT

Leaf essential oils (EOs) of Juniperus oxycedrus (Cupressaceae) wild grown in the region of Oum El Bouaghi (semi-arid area) in Algeria have been analysed by GC-MS. Fifty seven compounds were identified in the leave oils. The leaf oils were mainly composed of 5-Tetradecen-1-ol, acetate, (Z) - (12.9%) ç-Murolene (9.1%), α-Cadinol (5.1%) (ii)-Cadinene (3.9 %) and some other compounds which were only present in minor amounts. The antimicrobial activity of the essential oils were evaluated by the disc diffusion method and tested against Gram-negative Escherichia coli, Pseudomonas aerogenosa and Gram-positive Staphylococcus aureus bacteria. Results showed that Staphylococcus aureus was the highly resistant to the essential oil.

Keywords: Antibacterial activity; Chemical composition; Essential oil; GC/MS; Juniperus oxycedrus ssp. macrocarpa L.; Oum El bouaghi.

References

T3: Catalysis and the Environment
Modeling of the adsorption kinetics of a continuous process for the elimination of fluorides by electrocoagulation

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ABSTRACT

Batch electrocoagulation experiments (BEC) are always treated as batch adsorption experiments, with the notable difference that the adsorbent is added continuously as soon as it is formed by dissolution of the anode [1]. The objective of a continuous EC is to work under steady-state operating conditions. Thus, the behavior of a continuous EC treatment cannot be modeled as an ECB. Depending on the experimental conditions, the steady state is reached more or less quickly, which creates two situations with different modeling treatments.

A set of rate constant results have been obtained for the elimination of fluoride, assuming that these eliminations follow second-order kinetics. The results are between 0.94 and 2.29 L·g\textsuperscript{-1}·min\textsuperscript{-1}. For BEC, the elimination of fluoride anions, alone and in the presence of arsenic, follows a pseudo-second-order model with rate constants of 0.014 and 0.006 L·mg\textsuperscript{-1}·min\textsuperscript{-1} (where 14 and 6 L·g\textsuperscript{-1}·min\textsuperscript{-1}) respectively. Synthetic groundwater fluoride removal yields decaying rate constants between 62.9 and 5.3 L·g\textsuperscript{-1}·min\textsuperscript{-1} when the fluoride anion concentration increases from 3 to 12 mg·L\textsuperscript{-1}.

Keywords: Modelization; Fluoride; Continuous electrocoagulation; adsorption kinetic.

References

Ultrasound- promoted green synthesis under $\text{Cs}_5\text{HP}_2\text{W}_{18}\text{O}_{62}$ catalysis of a series of $N$-cyclic imides substituted benzenesulfonamide

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ABSTRACT

In the last few decades, the chemistry of cyclic imide substituted systems has received attention owing to their pharmacological and biological activities. These compounds have been described to exhibit a wide range of biological activities such as antibacterial, antifungal, analgesic, anti-stress agents [1-3] among others. Moreover, the incorporation of benzenesulfonamide moiety into organic molecules has a potential to modify the bioactivities [4].

Also, a considerable interest in the use of solid acids as heterogeneous catalysts in organic synthesis. Heteropolyacids type Dawson are certainly one of these solids that have been effectively used as catalysts in various organic transformations, because of their easy work-up procedures, easy filtration, minimization of cost and recycling of these catalysts [5,6]. Indeed, in this work we describe the condensation of some arylsulfonyl chloride derivatives, diamine and various substituted cyclic anhydrides in one step in the presence of a catalytic amount of heteropolyacid $\text{Cs}_5\text{HP}_2\text{W}_{18}\text{O}_{62}$ under ultrasound irradiation.

The reaction leads to the substituted-benzenesulfonamide derivatives containing cyclic imide moiety with good yields, after examining the model reaction in different conditions.

Keywords: $\text{Cs}_5\text{HP}_2\text{W}_{18}\text{O}_{62}$; Catalyst; Cyclic imides; Benzenesulfonamides; Ultrasound.

References

Adsorption of 2,4-dichlorophenol on Mg2-Al Lamellar double hydroxide
Kinetic and thermodynamic study

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ABSTRACT

The work deals with the preparation of Mg2-Al-LDH anionic clay by co-precipitation method with Mg/Al ratio equal to 2. Subsequently, the synthesized LDH phases was employed as adsorbent to remove 2,4-dichlorophenol (2-4 DCP) ions in aqueous solutions. The prepared LDHs were characterized by various analyses including N2 adsorption/desorption, Fourier transform infrared spectroscopy (FTIR), X-ray diffraction (XRD), and pH of point zero charge (pHPZC). The effect of stirring time, initial pH, initial concentration of adsorbate and temperature was studied in batch adsorption system.

Results show that the prepared material corresponds to typical Mg-Al-CO3 phase with a single crystalline phase. Kinetic data are well described by the pseudo-second order model and indicate that the studied LDHs are efficient in removing 2-4 DCP. It was also found that the adsorption mechanism is significantly affected by the pH value and temperature. The isotherm study reveals that the Dubinin-Radushkevich model best fit the equilibrium data.

Keywords: Mg2-Al-LDH, adsorption, 2,4-dichlorophenol, kinetic, isotherm

References

Sensitive detection of bisphenol A in water, based on an electrochemical aptasensor

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Abstract

Bisphenol A (2,2-bis(4-hydroxyphenyl)propane, BPA) is a monomer used in the industry for the production of polycarbonate and epoxy and polystyrene resins. Due to the ability of BPA to mimic both the structure and function of the 17-β estradiol hormone, it has been identified as an endocrine disruptor. As a consequence, due to its toxicity, it is really important to develop sensitive and easy methods to quantify this organic compound. Aptasensors are analytical devices that answer very well to these challenges. We designed an electrochemical highly sensitive aptasensor based on electropolymerized poly(pyrrole-nitrilotriacetic) acid film, onto vitreous carbon, which is the first step of the design of the aptasensor. The second stage is the immobilisation of a new aptamer functionalized by a pentahistidine peptide which is followed by the bisphenol A recognition step. Each step was successfully characterized by electrochemical methods as square wave voltammetry (SWV) and electrochemical impedance spectroscopy measurements (EIS). The designed label-free impedimetricaptasensor displayed a linear range from $10^{-11}$ to $10^{-6}$ mol L$^{-1}$ with a sensitivity of 372 Ω per unit of log of concentration. Besides the aptasensor has an excellent specificity towards interfering species as 4,4'-dihydroxybiphenyl and bisphenol P.

Keywords: Aptamer, aptasensor, bisphenol A, EIS, SWV.

References

Adsorption of strontium (II) ions from aqueous solution by bottom ash of expired drug incineration: Parametric, kinetics and thermodynamic studies

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ABSTRACT

Bottom Ash of Expired Drug Incineration (BAEDI) is used in this study for the removal of Sr (II). Batch adsorption experiments are carried out to study the effect of various parameters on the adsorption efficiency of strontium ions on BAEDI. Parameters such as pH of solution, dose of the adsorbent (r), initial concentration of Sr\(^{2+}\), temperature of the solution, contact time and stirring speed are studied. The kinetic data obtained for the adsorption process are analyzed through the different models. Two models are tested on the results obtained: the pseudo-first order and pseudo-second order model. The calculation of thermodynamic parameters (\(\Delta G^0\)), (\(\Delta H^0\)), and (\(\Delta S^0\)) is essential in determining the nature of the adsorption process. The optimum values of elimination are obtained at: (pH = 6, r = 2 g l\(^{-1}\), agitation speed=300 rpm) and equilibrium is established during 30 min under an ambient temperature of 293 K.

Statistical analysis and parameters obtained in the kinetic study show that the model of pseudo-second order fit the data. The values of the thermodynamic parameters obtained suggest that the process is endothermic, spontaneous and with a raised affinity for Sr\(^{2+}\). Adsorption on BAEDI is physical and limited by diffusion.

The adsorption of Sr\(^{2+}\) on BAEDI is proposed by two successive steps. Each of these steps can control the phenomenon of binding of Sr\(^{2+}\) to the active sites of BAEDI. The first step (External diffusion) which corresponds to the transfer of Sr\(^{2+}\) from the liquid phase to the external surface of the BAEDI. In the second step (Internal diffusion) the Sr\(^{2+}\) moves from the external surface to the active sites of the BAEDI. In this step an electrostatic attraction can take place between the active sites of BAEDI (The main species expected to form anions such as: Cl, S, P) and the Sr\(^{2+}\) ions.

Keywords: BAEDI, Strontium, Parametric, kinetics model

References

Comparison of the inhibitory effect of three water on the oxalo-calcic crystallization in vitro study

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ABSTRACT

The purpose of this paper is to investigate the inhibitory effect of three waters: water from hammam El-Charef, water from hammam Zelfana, and Zamzam water, on the crystallization of calcium oxalate using a spectrophotometric method. Following an assessment of water physiochemical analyses, we initiated crystallization by combining sodium oxalate and calcium chloride solutions, then monitor crystallization stages with a UV/VIS spectrophotometer. In the second part, induce crystallization and add inhibitors in varying concentrations (10, 50 & 100%). This allows us to compare the turbidimetric slopes without and with inhibitors, and it has been demonstrated that Zamzam water is the most effective inhibitor by 70.47%. Also, by comparing the photographs without and with inhibitors, we can conclude that Zamzam water acts at the growth stage, whereas the other two water act at the aggregation stage. The remarkable effect of these waters on the formation of oxalo-calcic crystals is due to their high concentration of mineral salts that act as crystallization inhibitors, such as magnesium (14.6 mg/L) iron (0.11 mg/L) and, sulfates (518.4 mg/L). The findings of our pilot study could help us reduce the formation and recurrence of oxalo-calcic stones using alkaline Zamzam water.

Keywords: Calcium-Oxalate; Hydrotherapy; Kidney Stones; Spectrophotometer; Urolithiasis.

References

2. Bensatal A., Ouahrani MR. Inhibition of crystallization of calcium oxalate by the extraction of Tamarix gallica L. Urol Res. 2008, 36:283–287. DOI: 10.1007/s00240-008-0157-1
Treatment of water polluted by methylene blue using the method of adsorption by activated carbon prepared from the nucleus of the olive

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ABSTRACT

pollution is one of the problems that humans face, and by entering the industry advanced stages, pollution in the ocean has increased, and we mention water pollution by some of the colorants used by some factories, and in this work we will treat the water from pollution by using methylene blue[1-3].

This treatment is done by activated carbon prepared from nucleus of the olive. The activated carbon previously prepared performs the adsorption process for methylene blue. We will also study the factors affecting the treatment process and begin to study the effect of methylene blue concentration (the concentration of the adsorbent material)[4-6].

We study the effect of the amount of activated carbon (the amount of adsorbent), after we study the effect of the type of middle in which the treatment takes place (the pH value on the treatment process). After studying all these effects, we choose the best results and conditions in which the water is treated from this pollutant.

Keywords: pollution; activated carbon; methylene blue; olive; adsorbent.

References

Box–Behnken optimization of anionic azo dye biosorption by chitosan/illite kaolinite composites from aqueous solutions: Kinetic and equilibrium investigations

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ABSTRACT

Response surface methodology (RSM) based on a three-variable and three-level Box–Behnken design was employed to interpret the adsorption characteristics of Congo Red (CR) anionic azo dye onto illite kaolinite/Chitosan (Ika/CTS) composites were prepared by a microemulsion process and characterized by FTIR, SEM, and EDS. Many pores and wrinkles were visible on the surface of the composites and provided a good condition for dye adsorption. The obtained results show that the fast CR removal (97.3%) may be achieved by loading 25% CTS into a matrix of (IKA/CTS-25) and at optimal adsorption operating settings (adsorbent dose of 0.04 g, solution of pH 7, temperature of 45°C, and contact duration of 120 min). At optimum conditions, the adsorption capacity was 90.09 mg/g. Freundlich isotherm and pseudo-second-order kinetic model were best. The results will be helpful for future up-scaling using novel materials as a low-cost adsorbent for removing anionic azo dyes.

Keywords: Illite kaolinite, Chitosan, Anionic dye, Response surface methodology, Adsorption.

References

The First International Seminar on Catalysis, Chemical Engineering & Green Chemistry

Determination of metals carried by TSPs in a suburban site of Algiers by nuclear techniques
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ABSTRACT

This study shows the levels of air pollution concerning the Total atmospheric Suspended Particles (TSP) and the mineral fraction which is conveyed by the latter in a suburban site, west of Algiers. The particulate sampling is performed by a low-flow sampler. The study shows that this suburban site, the air pollution by the TSP reached relatively low levels. We note that 76% of the levels found do not exceed the quality objective set by the Algerian regulations and the WHO (50 µg/m3), therefore, the TSP pollution is tolerable, with an average of (40 µg/m3). The analysis of metals associated with TSP by nuclear methods: Instrumental Neutron Activation Analysis (INAA) and the Energy Dispersive X-Ray Fluorescence (EDXRF) technique. INAA shows the presence of Cr, Pb, As, Ni, Fe, V, Zn, Mn, Se, Co, Sb, Ba, Br, Sc, Hf, Ce, Ca and Cu accusing relatively low values compared with limit values that regulate this form of pollution and the values published in the same line of research, but the inhalation of certain metals such as lead, chromium, nickel, arsenic, vanadium, manganese, cobalt and antimony even in small amounts may lead to toxic concentrations by accumulation effect in the body.

Keywords: Air pollution; TSPs; Metal; Nuclear techniques; suburban site.

References

Black Cumin Cake extract as an eco-friendly Corrosion Inhibitor on A9M Ordinary Steel in 0.5M H\textsubscript{2}SO\textsubscript{4}

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ABSTRACT

Plant extracts are considered a source of green and environmental inhibitors due to their high efficacy, low cost, and non-toxicity to humans and the environment [1-4]. In this work, we used the black cumin cake (BCC) obtained, after cold mechanical extraction of its oil, as a corrosion inhibitor for ordinary steel A9M, in an acid medium 0.5M H\textsubscript{2}SO\textsubscript{4}. The cake powder (5 g) was dissolved with 50 ml of 0.5 M H\textsubscript{2}SO\textsubscript{4} by maceration for 24 h. after centrifugation for 20 min at 4500 rpm. Then the filtrate obtained is collected and stored for later use. The methods used are Weight Loss Measurement (WLM); Electrochemical Impedance Spectroscopy (EIS); Potentiodynamic Polarization (PDP), UV-Vis spectroscopy, FTIR, and screening phytochemistry, and the characterization of the surface with scanning electron microscopy (SEM). The maximum inhibitory efficiency is 95 % at 6.10\textsuperscript{-2} (v/v) BCCE and the micrographs obtained confirm the presence of an inhibitory film [5-7]. BCCE is an effective corrosion inhibitor. This allows us to conclude that the BCCE has a double effect, a good corrosion inhibitor of A9M steel in 0.5 M H\textsubscript{2}SO\textsubscript{4}, and a good agent of protection environment by recovering this waste.

Keywords: Black Cumin Cake; A9M; Inhibitor; Corrosion; H\textsubscript{2}SO\textsubscript{4}; EIS

References

4. S. Belkaid et al., Garlic Extract as an Environmentally Corrosion Inhibitor of API X60 Carbon Steel and 316L Stainless Steel in Sulphuric Acid, https://doi.org/10.4152/pea.2022400403.
The Kinetic of biogas Production by an anaerobic co-digestion process: effect of ultrasonic pre-treatment in thermophilic phase

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ABSTRACT

In the current study, the biochemical methane potential test was carried out to estimate the biogas production from Olive mill waste by using an anaerobic digestion process in the thermophilic phase (T=55°C). Two kinetic models, including the modified Gompertz model, and Logistic (L) models were used to simulate the methane yield results. These equations allow to represent curves of sigmoidal shape using three parameters Pot∞, Rm and λ. The kinetic of methane production was calculated by performing a series of ultrasonic pretreatment out along the following exposure times: 2, 7, 12 and 17 min. The cumulative methane production curves according to the regression of GM and LM of the ultrasound treatment test correspond exactly to the experimental values. The two Gompertz and Logistic1 models best represent the experimental results of the cumulative volume of methane produced from the incubation of vegetable water in the thermophilic phase over nearly the entire incubation interval for ultrasonic testing. Constants in both models were found out by using Modeling with Origin 2018 software gave values of R2≥ 0.98 in both Gompertz and logistic1 models. The latency time is more important in the logistic model. The maximum production rate is higher for the logistic model with a value of 1.97 ml/gTVS.d for the S1 test (t=2min), but for the S0 test almost identical in both models.

Keywords: Methanisation; Ultrasonic pretreatment; Biodegradability; Olive mill was

References

Removal of cationic dye from aqueous solution by adsorption process using local agricultural waste

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ABSTRACT

The objective of this study is to evaluate the adsorbent capacity of local agricultural waste (date stones: DS), to eliminate a cationic dye (methylene blue) as a pollutant from aqueous solution. The surface characteristics of DS such as surface morphology, (PZC) Point of Zero Charge and functional groups were characterized by (SEM) scanning electron microscope, (PT) acid-base potentiometric and (FTIR) Fourier transform infrared spectroscopy, respectively. Physical and chemical factors affecting adsorption such as contact time, mass of adsorbent, pH value and initial concentration of the solution were studied in batch system. Isotherm equilibrium data are well described by the Langmuir model. The maximal adsorption capacity was found to be 63.59 mg g\textsuperscript{-1}. The kinetic study indicates that the adsorption process of methylene blue follows the pseudo second order model. The results showed that date stones could be used as a low-cost material for the removal of cationic organic pollutants from aqueous solutions.

Keywords: wastewater; cationic dye; Adsorption; Isotherm; agricultural waste.

References


ABSTRACT
The removal of toxic organic pollutants like synthetic dyes are considered from industrial wastewater is very crucial for maintaining mankind as well as environmental safety. In this regard, this participation aims to the exploitation of the wastes of Peanut Shells (PS) disturbingly dispersed particularly in El Oued's region (ALGERIA), and convert them into a renewable and sustainable product as a low-cost adsorbent that contributes to methylene blue (MB) dye uptake from aqueous solution. The adsorbent was characterized using BET, FTIR, SEM, and proximate analysis respectively. The equilibrium data were more consistent with the pseudo-second-order kinetic and Freundlich isotherm models, meanwhile, the Utmost monolayer capacity estimated from the Langmuir model was 291.5 for MB dye at 45 °C. Thus, the PS converted can candidate itself as a promising adsorbent for the uptake of the toxic cationic dye from the aqueous environment.

Keywords: Peanut Shells; Adsorption; Industrial wastewater; Methylene blue dye.

References
Adsorption of methylene blue from aqueous solution onto NaOH- modified date palm fibers

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ABSTRACT

In the present study, a new adsorbent based on hydroxylated date palm (DP) fibers was developed for the adsorption of methylene blue (MB) from aqueous solution. The prepared adsorbent material was characterized by infrared spectroscopy (FTIR) and scanning electron microscopy (SEM). The favorable adsorption conditions were selected by studying the contact time, initial concentration and temperature. The results indicated that the Langmuir isotherm model agrees very well with experimental adsorption data (R^2=0.983) with a maximum adsorption capacity 83.33 mg/g of (MB) at 25°C. Additionally, Data of the adsorption kinetics follow the pseudo-second-order kinetics (R^2=0.998). On the other hand, the thermodynamics studies show that the adsorption process is spontaneous and endothermic.

Keywords: adsorption, methylene blue, palm date, kinetics, thermodynamics.

References

Extraction and characterization the cellulose from peanut shells and application in adsorption of Methylene Blue Dye from Aqueous Solutions.

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ABSTRACT

This work revolves around recycling plant waste, extracting cellulose, and using it to remove organic pollutants from aqueous solutions.

In this study, we used peanut shells to extract pure cellulose, as these plant residues belong to the group of lignocellulosic products most abundant in nature. The purpose of its extraction is to reinvest the plant residues of peanut shells and improve their physical and chemical properties to become of high quality and economic value, in addition to applying them to remove methylene blue dye from previously prepared aqueous solutions. In this travel, we extracted cellulose from peanut shells by physical and chemical treatment until we obtained white and pure cellulose fibers with a yield of 31.81%. Then, the properties of the cellulose (Cs) from peanut shells were studied by the following techniques: X-ray diffraction (XRD), Fourier transform infrared (FTIR) spectroscopy, and scanning electron microscopy (SEM). The sorption of methyl blue dye (BM) onto cellulose fibers (Cs) from aqueous solution were investigated as function of pH, contact time and temperature. The adsorption capacities of BM dye is 107.33 mg/g at (C0= 300 ppm, t= 75 min, pH =7) and room temperature with Qmax= 40.96mg/g. The Langmuir, Freundlich and temkin adsorption models were applied to describe the related isotherms. The pseudo first-order and pseudo second-order models were used to describe the kinetic sorption, the results have clearly showed that the adsorption of BM dye onto Cs followed the pseudo second-order model. The enthalpy (∆H°), and entropy (∆S°) changes of adsorption were calculated, the results indicated that the adsorption of BM dye occurs spontaneously as an exothermic process.

Keywords: Cellulose; Peanut shells; Characterization; Adsorption; BM.

References: /
Extracting cellulose from agricultural waste and using it to remove organic pollutants from water

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ABSTRACT

In recent decades, the technological development of modern life has released many pollutants, so scientists are facing two serious environmental problems, waste management and water pollution.

New methods and applications have been sought to reduce these problems. Efforts have focused on converting agricultural waste, which for decades has been treated as common waste, to generate by-products that show huge potential for use as a source of valuable and usable compounds. This is due to the wide variety of compounds found in organic waste, biopolymers, bioactive molecules, and extracted oils.

These residues are widely applicable in various sectors, such as the production of cellulose as a sustainable absorbent that can be extracted from banana peel, wood straw, bamboo, palm, wheat, flaxseed, peanut shell, potato peel, corn stalk, rice husk, pine nuts and husk. Oranges, garlic peel and many other agricultural wastes. And its use as an adsorbent, because adsorption has become the focus of attention for the removal of heavy metal ions from water and wastewater. Cellulose has been used to absorb some of the hazardous contaminants present at the water level such as chromium, nickel, copper, zinc, dyes, etc.

In this study, cellulose was synthesized from a number of plant residues, by a series of chemical reactions. Through another chemical reaction, the cellulose size becomes nanocellulose, this is to ensure a larger surface area and more absorption. To improve results, we’ve also infused cellulose with a nanotexture, for optimal absorbency. Finally, we tested the resulting substance on dyes and got good absorption results.

Keywords: Waste recovery, agricultural residues, water depollution, cellulose, adsorption.

References

Montmorillonite K10 catalyzed synthesis of new 1-(substituted benzo[d]thiazol-2-yl) cyclic imide derivatives

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ABSTRACT

Green chemistry is focused to the use of new chemical approaches to reduce waste and toxic effluents. Therefore, it can minimize damage to the environment and helps us to improve the quality of life. Thus the development of methods using montmorillonite K10 (MK10) as solid and green catalyst for fine organic synthetic processes related to fine chemicals, such as flavors, pharmaceuticals and food industries have been under attention in the last decade [1].

Heterocycles containing benzothiazole moiety and/or cyclic imides are of interest because they show some pharmacological and biological activities [2-6]. Considering the importance of these bioactive compounds, herein, we report a convenient procedure to synthesis of novel substituted benzothiazole derivatives, using a catalytic amount of montmorillonite K10 as acidic solid under ultrasound.

Keywords: Montmorillonite K10; Catalyst; Benzothiazoles; Cyclic imides; Ultrasound.

References

Valorization of Bottom Ash of Expired Drug Incineration as adsorbent to remove strontium (II) ions from aqueous solution: Characterization studies

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ABSTRACT

Bottom Ash of Expired Drug Incineration (BAEDI) is used in this study for the removal of Sr (II). The adsorbent is characterized using several methods of characterization and analysis. BAEDI is synthesized from the incineration (NAR 5000, Company ECFERAL, Algeria) of the expired drug (ELEVIT) under a temperature of around 1123 K. It is washed with deionized water, and then the adsorbent is dried in ambient air for 24 hours. After that BAEDI is ground in a crusher, and sieved to different particle sizes. Finally, it is stored in desiccators.

Several analytical techniques are employed to ascertain the characteristics of BAEDI. IR spectra are obtained by using (IR Affinity-1S Shimadzu) with the Quest ATR accessory. Specific surface area measurements are performed with BET method using (Micromeritics ASAP 2010 at 77 K). The direct observations of the images are obtained with (MEB Quanta 250 from the FEI Company). Elemental analysis is obtained by using (Rigaku XRF (PRIMINI)) spectrometer operating in WDXRF mode. Mineralogical identification is performed by using a Diffractometer (XPERT-PRO MPD of PANALYTICAL (PHILIPS)).

BAEDI has an alkaline character (pH = 10.20), specific surface area is 41.02 (m\(^2\)g\(^{-1}\)). Elemental analysis revealed that BAEDI does not contain toxic elements (heavy metals). The images of adsorbent obtained by SEM before adsorption of Sr\(^{2+}\) and after adsorption showed the presence of regular areas with a homogeneous porous structure. However, this is not the case after adsorption of strontium a change in structure is observed. The FT-IR spectrum showed the presence of O-H, Si-O / Al-O and Si-O-Si. Mineralogical results indicate that the main crystalline phases are rich in Si and Ca.

BAEDI, selected and characterized, presents an economic and technological advantage (non-toxic, available in large quantities, less expensive and easy to use). It is comparable with other adsorbents, which is interesting for practical applications.

Keywords: BAEDI, structural characterization, Strontium.

References

The influence of precursor/plant extract concentrations (volume ratio) on the elaborated Zinc oxide nanoparticles photocatalytic activity

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ABSTRACT

The toxicity of the chemicals used to synthesize nanoparticles leads to by-products that can have adverse effects on the environment. Nanoparticles biosynthesis is a promising method, efficient and environmentally friendly technique that uses plant extracts to synthesize metal oxide nanoparticles. In the present work, we aimed to synthesize zinc oxide nanoparticles ZnO-NPs with the most excellent photocatalytic properties from the aqueous extract of the Eucalyptus leaves and the zinc acetate precursor. For this purpose, we firstly biosynthesized ZnO-NPs from different precursor/plant extract concentrations (volume ratio). Then, the kinetics of their photocatalytic degradation were carried out towards methylene blue (MB) dye under UV irradiation (365 nm). The photocatalytic activity was measured by UV-Visible spectrophotometric method. Based on the best MB degradation kinetic, we concluded that the best volume ratio to synthesize the ZnO-NPs with the most outstanding photocatalytic activity was (1:10).

Keywords: ZnO-NPs; Photocatalytic Activity; Volume Ratio; Eucalyptus leaves.

References

In Situ Synthesis of a Polyaniline/iron oxide Composite materials for Dye Removal by Adsorption

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ABSTRACT

Conductive polymers have become a remarkable candidate for different applications. Polyaniline (PAni) is the most promising contender because of its easy method of synthesis, low cost, and higher choice in the improvement of their properties by the combination of other materials.

In this work, we have chemically synthesized a composite material polyaniline/Fe2O3 by in situ addition of Fe2O3 as fillers in the PAni matrix. These hybrid materials are obtained from an aqueous solution containing the monomer (aniline) and semiconductor particles under ambient temperature. The composites were then characterized X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FTIR), and four point method to observe the crystal structure, functional groups, and electrical conductivity of samples, respectively.

X-ray diffraction analysis shows that the polyaniline structure becomes crystalline under the effect of doping, while the FTIR spectroscopy allowed us to confirm the formation of polyaniline/Fe2O3 by displacement of certain bands of polyaniline and the appearance of new bands of low intensities indicating the interaction between Fe2O3 and polymer chains. Compared with pure PAni, the conductivity of the PAni/Fe2O3 composite with a Fe2O3 content of 10% increases by 1.44*10-6 to 0.12 S/cm. This can be attributed to the doping effect associated with the Fe2O3 particles, which are supposed to contribute to inducing the formation of a more efficient network for the transport of charges, thus improving the conductivity of the composite. The applicability of PAni/Fe2O3 in adsorption of dye such as methylene blue were investigated.

Keywords: Polyaniline; iron oxide; chemical elaboration; composite materials, Polyaniline; iron oxide; chemical elaboration; composite materials, dye adsorption
Synthesis of ZnO Nanoparticles Using Different Sources of Chitosan: Effects on Photocatalytic Degradation of AZO Dye

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ABSTRACT

Chitosan has been used in the synthesis of zinc oxide nanoparticles (ZnO NPs) as a capping agent to control size, morphology, optical bandgap, photocatalytic efficiency. Different sources of chitosan have been used for the synthesis of ZnO NPs, namely chitosan from shrimp shells, crab shells and Streptomyces griseus bacteria. The photocatalytic efficiency was studied using the methylene blue (MB) photodegradation test. The particle size of the ZnO NPs varied between 20 and 80 nm, and the band gap energy varied between 2.7 and 3.2 eV. ZnO NPs with lower bandgap values showed better antibacterial results compared to ZnO NPs with higher bandgap values. Removal of MB dye from ZnO (shrimp shells), ZnO (crab shells), and ZnO (Streptomyces griseus) reached 60\%, 56\%, and 44\%, respectively, at a contact time of 60 min, a low initial MB dye concentration of $6 \times 10^{-5}$ M, solution temperature of 25 °C and pH = 7.

Keywords: Chitosan, ZnONPs, photocatalytic degradation, photocatalytic activity, AZO dye.

References

Adsorption of cationic dyes from aqueous solutions using enhanced clay by green algae

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ABSTRACT

The objective of this work is to improve Algerian clay by using green algae to adsorb methylene blue (BM) dyes from their aqueous solutions. The objective of this work is to improve Algerian clay by using green algae to adsorb methylene blue (BM) dyes from their aqueous solutions. Where various analyzes were conducted to study: the surface shape, the crystallization of the material, and the functional group of clay and algae. The design (Behnken – Box) to improve the loading condition (loading of algae with clay, as well as adsorption agents (adsorbent dose, solution pH, and temperature and contact time). The obtained results show that the fast BM removal (91.34\%) can be achieved by loading 50\% clay into algae \textsuperscript{and at optimum adsorption operation parameters (adsorbent dosage of 0.05 g, solution of pH 5, temperature of 45\(^\circ\), and contact time of 32.5 min). The adsorption results were well described by pseudo-second-order kinetic, and adsorption isotherm was followed both Freundlich and Temkin models. The maximum adsorption capacity (q_{\text{max}}) of algae/clay for BM dye was found to be 113.5 mg/g.

Keywords: Algae; Algerian clay; Methylene blue dye; Adsorption; Isotherm models.

References


Green synthesis of Zinc Oxide Nanoparticles: Characterization and Applications

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ABSTRACT

Green synthesis of nanoparticles by biological systems and especially plant extracts is becoming an emerging field in nanotechnology. In this study, zinc oxide nanoparticles were synthesized using lemon peel extract. The fabricated ZnO nanoparticles were characterized by ultraviolet-visible (UV-Vis) spectroscopy, Fourier transform infrared (FT-IR), X-ray diffraction (XRD), energy dispersive X-ray (EDX) and electron analysis. scanning electron microscopy (SEM). Due to contamination from organic dyes in wastewater discharged to the aqueous system, we investigated the effectiveness of ZnO nanoparticles to test the photocatalytic activity on some organic dyes.

Keywords: Green synthesis; ZnO NPs; Characterization; photocatalytic activity; dyes.

References

The First International Seminar on Catalysis, Chemical Engineering & Green Chemistry

Effect of pyrolysis temperature on removal efficiency of dyes

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ABSTRACT

Pollutant found often in textile, dyeing, paint, cosmetics, food, leather, paper and pulp industrial wastewater are dye molecules. The textile industry that uses largest volume of water usually discharges effluent containing spent dye into water bodies. As a result of the increase in human needs for clothing and high production level of this industry, the widespread use of dyes especially rhodamine B causes environmental pollution when the spent colored wastewater is released into the ecosystem. Agricultural waste was used for the preparation of sustainable and eco-friendly adsorbent through chemical activation, followed by pyrolysis at 400 °C and 500 °C and 600 °C for adsorption of Rhodamine B dye from aqueous solution. Zinc chloride was used to activate the carbon and studies the performance of different parameters such as contact time, initial solution concentration and adsorbent mass. The characterized using Fourier transform infrared spectroscopy (FTIR), scanning electron microscopy (SEM), pH point zero charge (pH pzc) techniques. The influence of various adsorption parameters was investigated for determination of optimum conditions for sequestration of RhB dye. Equilibrium adsorption isotherm and kinetic models were equally assessed.

Keywords: adsorption; pyrolysis temperature; RhB; kinetic;

References

Comparative study on the adsorption of anionic and cationic dyes by using Palm-Date trunks as adsorbent

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ABSTRACT

This work is a comparative study of adsorption of two different organic dyes (anionic: Methyl Orange (MO) and cationic: Crystal Violet (CV)) on Palm-Date Trunks (PDT) powder. The morphologic and spectroscopic analysis by using of FTIR, XRD, SEM methods shows that this material has an unorganized crystal structure and it has an heterogeneous, porous and charged surface.

The influence of some factors on the adsorption process shows that the optimal mass of PDT powder is 1g and 3g for CV and the MO respectively. The adsorbed quantity ($Q_{\text{ads}}$) of studied dyes and for all initial concentrations ($C_0=25-150$ mg/l) is important from the beginning of the contact time. The equilibrium time is 45min around in all cases. The adsorption of MO is very favored in acidic medium. However, the pH change does not influence on the CV adsorption. The temperature increase from 20°C to 55°C increases slightly the adsorption of CV. The kinetic study shows that the second-order model and Elovich kinetic model are very suitable for explaining the dyes adsorption process. The modeling of adsorption isotherm proved that the adsorption of the dyes follows the Freundlich model, where $R^2$ it was 0.9815 for MO and 0.9035 for CV. In effect, the results of optimal experiments show that the adsorption rate of CV and MO on PDT are 90.4% and 57.41% respectively.

Keywords: Adsorption; Methyl Orange; Crystal Violet; Date Palm Trunks; Lignocellulosic Material.

References

Removal of Ca\textsuperscript{2+} cation by membrane S-PES modified with silica functionalized

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ABSTRACT

Present study. Removal of Cd\textsuperscript{2+} cations by modified cation exchange membranes, based on sulfonated polyethersulfone S-PES. The modification of the membranes was carried out by silica functioned with graffring an agent such as APTES and MPTES onto the surface of membranes. The increasing order of the elimination efficiency is presented as follows: S-PES<S-PES-SiO\textsubscript{2}<S-PES-SiO\textsubscript{2}-(CH\textsubscript{2})\textsubscript{3}-SH< S-PES-SiO\textsubscript{2}-(CH\textsubscript{2})\textsubscript{3}-NH\textsubscript{2}. Modification of S-PES by par SiO\textsubscript{2}-(CH\textsubscript{2})\textsubscript{3}-NH\textsubscript{2} is most favorable for the removal of Cd\textsuperscript{2+} cations. The membranes characterized by FTIR, ATG, MEB-EDX and DRX. The results showed that removal of Cd\textsuperscript{2+} by S-PES-SiO\textsubscript{2}-(CH\textsubscript{2})\textsubscript{3}-NH\textsubscript{2} membrane being more favorable compared to that of S-PES-SiO\textsubscript{2}-(CH\textsubscript{2})\textsubscript{3}-SH for all concentration.

Keywords: silica; membrane; cation; polyethersulfone; sulfonated

References

5. K. Sriram, G. Arthanareeswaran, A. F. Ismail &Diby Paul , To cite this article: K. Sriram, G. Arthanareeswaran, A. F. Ismail &Diby Paul (2016),“Effects of special nanoparticles on fuel cell properties of sulfonatedpolyethersulfone membrane”, International Journal of Polymeric Materials and Polymeric Biomaterials, 65:6, 294-301, DOI: 10.1080/00914037.2015.1119685 To link to this article: http://dx.doi.org/10.1080/00914037.2015.1119685
Biosynthesis of MgO NPs using Chitosan extracted from *Pimelia payraudi* Latreille

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**ABSTRACT**

One of the most prevalent biopolymers in nature, chitosan (CS) has excellent qualities including biodegradability, biocompatibility, antibacterial activity, lack of toxicity, speeding up the healing process for wounds, and immune system activation. In this work, chitosan was extracted from the exoskeletons of beetles and utilized to create very pure MgO NPs by a simpler, more environmentally friendly process. The extracted chitosan showed excellent physicochemical properties, including high extraction yield (39\%), low ash content (1\%), an unusual crystallinity index (51\%), and high degree of deacetylation (90\%). With crystallite diameters of 17 nm, particle sizes of around 20-70 nm, and bandgap energies of 4.43, the MgO NPs displayed a spherical shape.

**Keywords:** Chitosan; MgO NPs; Nanotechnology; Pimelia payraudi Latreille.

**References**


Reactivity of copper based catalysts in the green organic synthesis of 3,4-dihydropyrimidinone: effect of the combined oxide

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ABSTRACT

This work is focused on the study of the reactivity of heterogeneous catalysts based on copper combined with silica SiO2 and zinc oxide ZnO, prepared by sol-gel method, in the organic synthesis of the 3,4-dihydropyrimidinone (DHPM) molecule via the Biginelli multicomponent reaction. This reaction is classified in the organic synthesis processes known under the concept of green chemistry. It consists of mixing in one pot three reactants which are: benzaldehyde, ethyl acetoacetate and urea in order to synthesize DHPM which is part of the constitution of various biologically active molecules [1,2]. In our study, this reaction was carried out under reflux at a reaction temperature of 100°C with the respective quantities of reactants: 1 ml/1.25 ml/0.9 g, with free solvent and using a mass of catalyst of 0.01g. After 2 hours of reaction, the obtained results showed for the pure oxides, a practically no activity of the silica (yield less than 5%) unlike the zinc oxide which led to a very high DHPM yield estimated at 64%. The addition of copper has a clearly remarkable effect on the silica such that the yield of the mixed catalyst 30%Cu-70%SiO2 is 50%. On the other hand, the addition of copper in the case of zinc oxide does not affect its yield in DHPM (stable around 66% for the 30%Cu-70%ZnO catalyst).

Keywords: Organic synthesis, heterogeneous catalysis, copper, zinc oxide, silica

References

Experimental study and study of molecular dynamics on the properties of nanoparticles of carbon-based materials

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ABSTRACT

Recently created carbonaceous material known as carbon dots (C dots) has drawn significant attention across a wide range of research fields. because of their advantages in being water soluble. They could be used in future nanodevices in place of conventional semiconductor quantum dots due to their chemical inertness, low toxicity, and preferable biocompatibility. simple functionalization and beneficial photoluminescence in actuality. It has been proven that they can be used in a wide range of fascinating applications, such as bioimaging, biosensors, light-emitting diodes, etc. Several methods have been devised to prepare C-points, including laser ablation, pyrolysis, injection heating, microwave irradiation, thermal oxidation, and electrochemical oxidation. In the previously stated processes for creating C-dots, hazardous or high-temperature compounds are frequently utilized, which also have a lot of disadvantages such as a low product yield, an inability to adjust size, and a limited spectrum efficiency. Because of this, developing new techniques is essential, which have less environmental impact. The production of C-dots must take into account the maintenance of a green environment, the mitigation of global warming, and the assurance of sustainable and renewable energy sources.

Keywords: carbon quantum dots, green synthesis, molecular dynamic

References

2. Zahra Ramezani; Maryam Qorbapour; Nadereh Rahbar; Green synthesis of carbon quantum dots using quince fruit (Cydonia oblonga) powder as carbon precursor: Application in cell imaging and As3+ determination; Colloids and Surfaces A: Physicochemical and Engineering Aspects; Volume 549, 20 July 2018, Pages 58-66
3. Wei Du, Xiaojian Xu, Han Hao, Rongmei Liu, Di Zhang, Feng Gao & Qingyi Lu; Green synthesis of fluorescent carbon quantum dots and carbon spheres from pericarp; SCIENCE CHINA Chemistry; January 2015 Vol.58 No.1: 1–8
5. https://pubs.acs.org/doi/10.1021/acscentsci.0c01306 02/12/2022.
ABSTRACT

The use of bio-waste, abundant and at low cost, as an adsorbent is a promising application against various environmental pollutants. In addition, the chemical modification of biowaste leads to obtaining an adsorbent with significant removal efficiency against various pollutants. The effects of the dose of biosorbents, pH, contact time and temperature on the efficiency of the removal of organic matter from raw water were studied, in order to define the optimal treatment parameters. The biosorbents presented, under optimized conditions, a good pollutant removal efficiency which is superior or similar to that obtained in the presence of commercial activated carbon.

Keywords: Bio-waste; Adsorbent; Environmental pollutants; Water treatment.

References

Sonochemistry in Transition Metal Catalyzed coupling Reactions using in DMF/water

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ABSTRACT

Transition metal catalyzed cross-coupling reactions have always been very important in synthetic organic chemistry due to their versatility in forming all sorts of carbon-carbon and carbon-hetero atom bonds. Incorporation of ultrasound assistance to these protocols resulted in milder reaction conditions, faster reaction rates, etc. This review focuses on the contributions made by ultrasound-assisted [1-3] protocols towards transition metal catalyzed cross-coupling reactions. Compare to the previous works, this procedure has advantages such as easy workup, high yields of products, environmentally benign and short reaction times. The novel nickel catalyst prepared and characterized.

Keywords: Cross-coupling reaction; C–C bond formation; Pd catalysts; ultrasound; Sonogashira: Transition metal.

References

Improved photocatalytic degradation of Coomassie brilliant blue G-250 dye on the new CuCo$_2$O$_4$/CdS hetero-system under solar irradiation.

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ABSTRACT

In this present work, we used a new CuCo$_2$O$_4$/CdS heterosystem [1] for the photocatalytic degradation of Coomassie brilliant blue G-250 dye (CBB G-250) under solar irradiation. The ratio of CuCo$_2$O$_4$ and CdS oxide in the heterosystem has been well studied. Similarly, the experimental conditions leading to the total degradation of CBB G-250 were optimized. The physical and optical properties of CuCo$_2$O$_4$ and CdS were studied and correlated with photoelectrochemical characterization to establish the energy diagram of the CuCo$_2$O$_4$/CdS heterosystem. The XRD, DR, BET analysis were carried out for the two materials constituting their heterojunction. CuCo$_2$O$_4$ and CdS have respective gap values (E$_g$ = 1.97 eV and 2.75 eV), their optical transition is direct. Conduction band electron transfer from (CuCo$_2$O$_4$–CB) to CdS–CB occurs upon absorption of sunlight, which promotes the separation of charge carriers, thus accelerating the degradation of CBB G-250. Under simple conditions and under solar illumination and a (pH $\sim$ 8, T $\sim$ 25°C and dose of 1 mg/ml of catalyst) the degradation of 10 mg/L of CBB G-250 is complete after 2 hours of irradiation, the photodegradation phenomenon [2] obeys pseudo-first order kinetics with an apparent constant constant of 0.01 min$^{-1}$.

Keywords: Hetero System CuCo$_2$O$_4$/CdS; photo catalysis; CBB G-250; solar light.

References

Modeling and process optimization of renewable energy production

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ABSTRACT

The production of energy requires intense engineering processes that lead to direct or indirect emissions of carbon dioxide. Sustainable energy production through biomass conversion has recently found growing interest. However, the complexity of these processes requires the improvement of numerical models that can integrate physical, chemical and biological parameters and simulate the processes. Several designs have been developed to simultaneously model and optimize the process. This work describes the fundamental knowledge needed for modelling, applying the models using experimental data to demonstrate the importance of process-affecting parameters to optimize the efficiency of the expected conversion process.

Keywords: Renewable energy; Modeling; Optimization; Conversion efficiency.

References


ABSTRACT

Green synthesis of metal and oxide metal nanoparticles (NPs) has attracted considerable attention because of its cheaper protocols and more environmentally friendly than standard synthetic methods. Green synthesized copper oxide nanoparticles have attained significant importance because of their distinctive properties, and their varied range of applications such as, optical, antibacterial activity. Green synthesis of CuO nanoparticles utilizing extracts of purslane was effective in this study. The functional groups involved in the green synthesis of CuO nanoparticles were validated by FT-IR spectra, as well as the powder XRD patterns, and UV-Vis of the CuO nanoparticles.

Keywords: Green synthesize, Nanoparticles, Copper oxide, FTIR, XRD

References

Synthesizing 3,4-dihydropyrimidine-2-(1H)-one in the presence of Co-ZnO and Ni-ZnO

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Abstract

Multicomponent reactions have received special attention due to their economic and ecological advantages known under the concept of "green chemistry". Among the widely exploited multicomponent reactions, the Biginelli reaction produces dihydropirimidinones (DHPMs) using benzaldehyde, ethyl acetoacetate and urea as reactants, this work, we study the Biginelli reaction in heterogeneous media in free solvent in the presence of (30 wt%) Co-ZnO SG and (30 wt%) Ni-ZnO SG as catalysts prepared by sol-gel method and characterized by X-Ray Diffraction (XRD), Fourier Transform Infrared (FTIR) methods. (30 wt%) Ni-ZnO SG sample prepared by the sol-gel method exhibited the highest DHPM yield (61%), in free solvent with a reaction time of 1h

Keywords: Sol gel; heterogeneous media ; catalysts ; Biginelli.
Study of the Physical and Chemical Quality of Runoff water from Urban Surfaces

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ABSTRACT

Stormwater is now recognized as a substantial source of pollutants to receiving aquatic environments. Runoff water over surfaces results in contamination with organic and inorganic micropollutants. The objective of this work is the characterization of the quality of runoff water and the confirmation of their heterogeneous character. To this end, different samples were collected on several sites of the Algerian watershed in order to evaluate the concentration of pollutants. Runoff water is loaded with suspended solids, nutrients and other contaminants [1]. The increase in pollutant concentration depends on multiple factors: rainfall intensity, runoff intensity, nature of the surface material, nature of the activities on or near the surface [2].

The characterization focused on the analysis of physicochemical parameters such as pH, conductivity, COD, BOD, TSS, orthophosphate, sulfate, nitrate, nitrite, ammonium, potassium, calcium, magnesium and sodium ions. The descriptive analysis of the physicochemical parameters showed that the waters have very high concentrations of nitrite and metal ions. The analyses were performed by UV-Visible spectrophotometry, flame spectrophotometry and atomic adsorption.

Keywords: Runoff water, pollutants, pollution parameters, physico-chemical analysis.

References

Elimination of diclofenac by elaborated bio-composite based on Moringa Oleifera and modified Alginates.

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ABSTRACT

Due to the adverse effects of environmental pollution and its threats to human health and the functioning of ecosystems worldwide, the pollution of aquatic environments in particular is affected by this crucial phenomenon distressing scientists over the years to find effective solutions to eliminate the impact of this pollution and to protect water that is becoming a resource increasingly scarce.

Industrialization is one of the main causes of pollution of these limited resources, as well as the frequent use of a large number of chemicals and drugs in everyday life leading to a dissemination in the environment of various substances called "emerging pollutants", once dissolved in water, their elimination by the conventional treatment steps of water treatment plants becomes difficult.

Our work is part of the treatment of water contaminated by pollutants or emerging pharmaceutical micropollutants using the recovery of waste from the plant of moringa oleifera and modified alginates. A chemical synthesis of a biosorbent based on the bark of the moingua fruit and alginates was carried out. The latter was tested for the removal of the emerging pharmaceutical pollutant sodium diclofenac from the contaminated solutions.

A study of the kinetics of elimination of the pollutant was elaborated as well as the optimal parameters of adsorption and that for the alginate in beads form, Moringa and the composite (alginate/moringua). The characterization was carried out by: Fourier transform infrared spectroscopy FTIR, the pH of zero charge point pHpzc, and the adsorption tests were measured by spectrophotometry. The preliminary results found are very encouraging.

Keywords: biosorbent; emerging pollutant; sodium diclofenac; sorption kynetics; Moringa oleifera.

References

The First International Seminar on Catalysis, Chemical Engineering & Green Chemistry

Environmental Effect of Caracterization of Water Resources in Algiers Watershed (Bouira area).

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ABSTRACT

Concern for the environment presupposes a certain basic dynamism aimed at safeguarding against all types of pollution. Studies can guide practices and development towards better management and environmental awareness. Groundwater resources are an alternative to rainwater and dam water. The preservation and qualitative and quantitative control of these resources is an economic and social necessity. It allows their direct exploitation and avoids additional treatment costs. The objective of our work is to quantify the water resources of certain sites in the basin hydrographic Algerian Coastal (Bouira area), and to determine and quantify the mineral pollution of these waters. This study envisaged a physicochemical characterization to highlight several parameters that come into play in the determination of the quality of the waters of this basin, such as temperature, pH, conductivity, and Ca$^{2+}$, Mg$^{2+}$, Na$^+$, K$^+$, Mn$^{2+}$, Li$^+$, Zn$^{2+}$, Cu$^{2+}$, NH$_4^+$, SO$_4^{2-}$, NO$_3^-$, NO$_2^-$, Cl$^-$, HCO$_3^-$ and PO$_4^{3-}$ ions. The use of the Piper, Stabler and Schöeller-Berkaloff diagrams made it possible to carry out a hydrochemical study of these waters and thus to know their chemical facies, quality and potability. The use of these diagrams was facilitated by its automation thanks to the software (Rolond SIMILER Hydrogeology Laboratory of Avignon). The results showed a difference in the concentration of some physicochemical variables, some of which meet the applicable standards (WHO standards) and some of them exceeded. It may be due to the quality of the soil or the excessive use of fertilizers, which made us think of some solutions to treat this water without affecting its properties. This led us to conclude that the surrounding areas are not contaminated by certain harmful pollutants, namely heavy metals, dyes and organic pollutants. The follow-up of these analyses allows us to promote a sustainable development of the region in terms of drinking water consumption, and to detect all kinds of contamination at the right time.

Keywords: Hydrographic basin, hydrochemistry, pollution, water treatment.

References

Synthesis of aluminosilicates type zeolite from natural products from the south west Algerian area by hydrothermal
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ABSTRACT

Releases of various micropollutants (anionic dyes, heavy metals...) in the environment is increasing, and these pollutants, toxic and poorly decomposing, are usually the source of many adverse health effects. Aluminosilicate was synthesized by the autoclave method, in an alkaline medium, using clay from the Algerian south-west. The use of kaolin in this study, a systematic investigation was carried out to develop a new hydrothermal alkaline activation route to avoid acid aluminosilicates being insoluble and synthesize zeolites of high purity. Metakaolin was achieved by calcining the first at 600 °C for 3 hours. This route begins with the hydrothermal reaction of natural kaolin and sand treated with sodium hydroxide to an aqueous composition sodium aluminosilicate (such as hydroxycancrinite and nepheline hydrate), which are then dissolved dilute hydrochloric acid. The resulting acidic solution, after filtration to remove unreacted metal impurities, is then adjusted in PH. The main advantage of this method is that it allows to use low-cost kaolin and produce high-quality zeolites when raw kaolin is purified. Raw kaolin, metakaolin and synthetic products (zeolites) were distinguished by X-ray diffraction (XRD) and infrared (FTIR).

Keywords: Kaolin; Hydrothermal; Zeolites; Aluminosilicates; Sand; environmental.

References
6. Title of the website, URL in full, (date accessed)
Use of glass waste to elaboration of a new ceramic

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ABSTRACT

The saving of the raw material obliges us to research new methods of replacement by recycled materials (1). And in this case, we do this study which uses glass waste (cullet) to develop a new ceramic and we use clay (local bentonite of maghnia) as a bonding agent and has excellent plasticity (2). to produce ceramic tiles, a base temperature with a variation in the mass percentage of bentonite and two different particle sizes of glass waste. After the characterization of the raw material (ATG / DSC, chemical composition, DRX, granulometric) the tiles obtained are characterized for determines the physical and chemical and mechanical characterizations (density, shrinkage, absorption, porosity, mass loss, humidity, chemical attack, Flexion, breaking force, hardness) the purpose of this work is to recover the large quantity of glass waste (3) and savings in raw materials and energy (4). And uses the tiles instead of the floor slab elaborated by the raw material.

Keywords: clay; waste glass; tiles; proprieties.

References

Green synthesis of spherical TiO$_2$ nanocomposite using *Aspergillus carbonarius* fungus: Excellent photocatalytic water decontamination agent for RR 18 dye

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ABSTRACT

Heterogeneous photocatalysis is an efficient, economical and environmentally friendly technology for removing organic contaminants from the aqueous environment. In this research work, the semiconductor photocatalyst titanium dioxide (TiO$_2$) was used to impregnate on *Aspergillus carbonarius* fungus (AC) for photocatalytic oxidation of azo dye solution. The photocatalytic decolorization of textile dye Reactive Red 180 (RR180) was investigated and the impact of catalyst loading as well as initial dye concentration was systematically examined. The synthesized nanocomposite is characterized by using Attenuated Total Reflectance Infrared Spectroscopy (ATR-IR), X-ray diffraction (XRD), scanning electron microscopy (SEM) and energy dispersive X-ray spectroscopy (EDS). The enhanced photocatalytic activity with respect to time and catalyst concentration was examined for RR 180 acting as a model dye which is better than many reported results. Almost 76% dye was degraded within 120 min which shows its excellent photocatalytic efficiency.

Keywords: Dead fungi; Biosorbent; Photocatalysis; Dye decolorization; TiO$_2$.

References

The PV Industry Needs and Waste, case of Removal of one Dominant Pollutant Ion by Different Techniques

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ABSTRACT

Energy from fossil fuels has their own advantages, but the damage that they may cause to the environment can affect heavily the ecosystem. In the last few years, the photovoltaic (PV) energy conversion has become an emerging technology, and its demand is increasing rapidly, this technology is gradually viewed as an alternative one which may contribute to the world energy supply. Solar graded silicon is the basic material for solar cells manufacturing. Different production processes steps require a mixture of HF/HNO$_3$ and an important amount of water, resulting in industrial effluents characterized by the presence of hydrogen fluorides, suspended solids, mixed acids, SiO$_2$, and high oxide particles. Industrial waste waters from PV production have high concentrations of fluoride, typically in a range of 500-2000 mg/L. Consequently, the resulting waste waters need to be strictly monitored and regulated because of the very toxic nature of the two dominated pollutants that are the nitrate and the fluoride ions.

In this work, an outline of manufacturing steps of silicon wafers and a classification of effluents are presented. Some results of the elimination of synthesized effluent containing fluoride ions by different techniques are given. Activated alumina as adsorbent removed the fluoride ions at 60%; using electrocoagulation process the ions were removed at 80%; and using the electrodialysis system, the concentrations of the pollutants in treated solutions remain below that recommended by the world health organization (WHO).

Keywords: PV factory, Fluoride, Activated alumina, Electrocoagulation, Electrodialysis.

References

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The photocatalytic degradation of methyl blue in the presence of synthesized material ZnWO4

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ABSTRACT

The treatment of water contaminated by dyes has experienced great development in recent years. Indeed, organic dyes are constituents widely used in textiles, paper, food and cosmetics industries and constitute one of the main groups of pollutants in wastewater [1].

It is therefore very important to protect the environment from these contaminants. It is in this context that various methods have been used for the elimination of color from textile effluents such as adsorption, precipitation, air extraction, flocculation, reverse osmosis and ultrafiltration. Among these various treatment methods used to degrade these refractory pollutants, the process of photo-catalysis which is carried out with semiconductor materials such as TiO2, ZnO, Fe2O3, Photo-catalysis is based on the principle of activation of a semiconductor using the energy provided by light. The semiconductor is considered to be a catalyst. Its principle is close to heterogeneous catalysis where the oxidation-reduction reaction takes place on the surface of the catalyst [2].

In this study, the synthesis of ZnWO4 catalyst was carried out by the molten salt method. The mixture was prepared and then calcined under a temperature of 700 degrees for 4 hours. The morphological structure of semiconductor material was explored by X-ray diffraction XRD has a pure monoclinic structure of space group P2/c. and scanning electron microscopy SEM and EDX show as physic-chimiques properties about the material, then by infrared analysis FTIR. We used the analyse BET to calculate the specific surface, pore diameter of the synthesized material. Photocatalytic study of synthesized catalyst treated under the influence of ultraviolet radiation UV (364 nm, 6W) and solar radiation to degrade the organic pollutant methylene blue. Photo-catalysis of this cationic pollutant follows first-order reaction kinetics. The rate of degradation approximately 66% under influence of ultraviolet and 88% under solar radiation.

Keywords: molten salt; catalyst; photoctalytic; synthesized; kinetics.

References


Mn(II) ion elimination study on blast furnace slag: kinetics and thermodynamics

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ABSTRACT

Water pollution by metal ions is one of the most undesirable environmental problems in the world that requires immediate solutions [1-4]. So, in this study, we used blast furnace slag to remove Mn (II) ions from an aqueous medium. The various characterization processes have specified that the blast furnace slag is composed of lime, silica, alumina, and magnesium oxide. Its specific surface area of 328.61 m²/g. Experimental results have shown that contact time, agitation, pH, temperature, particle size, and initial solute concentration play a major role in this process. The adsorption kinetics showed that equilibrium is reached after 60 minutes of stirring and that the maximum adsorbed capacity is 59.88 mg/g. According to the adsorption isotherms, the sorption of Mn(II) ions occurred on a monolayer homogeneous surface [5]. The parameters of the Langmuir (RL) and Freundlich (1/n) models demonstrated that this process is favorable. The experimental data showed that the adsorption process follows pseudo-second-order kinetics. Furthermore, internal and intraparticle diffusion control the diffusion of M(II) ions from the solution to the adsorbent. The temperature variation of the solution proved that the manganese sorption on the slag is physical, spontaneous, exothermic, and less entropic at the solid-liquid interface.

Keywords: Slag, Mn(II), adsorption, kinetics, pollution

References

Activation of activated carbon based on date palm waste and application to the environment. Adsorption of a textile dye

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ABSTRACT

The evolution of the chemical properties of activated carbon saturated with phosphoric acid has been studied in the literature, but few works take into account the evolution of most of the porous properties of the adsorption phenomenon. This study focuses on the effect of phosphoric acid concentration (60% and 30% by mass) on palm waste. Activated carbon made from palm trash was characterized using FTIR, phpzc, and ATG. Additionally investigated were the iodine index and the methylene blue index. It was investigated how different variables, including starting dye concentrations of 10–500 ppm and pH (2–10), adsorbent dose (0.005–1 g/L), contact period (20–480 min), and other variables, affected the results. Compounds were evaluated in solution before and after adsorption using FTIR spectroscopy. Application of and experimental results supporting isothermal models of Langmuir and Freundlich. The findings demonstrated that the adsorption phenomenon closely matches the Langmuir isotherms a pseudo-second-order model best captures the sequential adsorption kinetics of methylene blue dye on palm residue. The outcomes demonstrated that phosphoric acid significantly enhanced the aforementioned properties. This study also confirmed the nature of the starting material, the rate of impregnation between H3PO4 and the precursor, and the activation temperature. Important factors affecting the properties of finished activated carbon products.

Keywords: Phosphoric acid; palm; adsorption; porosity; chemical activation

References

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Removal of cationic and anionic dyes from aqueous solutions using nitronite clay: isotherm, kinetics and thermodynamic study

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ABSTRACT

The objective of this work is to address the removal of pollutants from aqueous solutions by the adsorption process using clay from the Djelfa region as the most abundant and low-cost natural material. First, the clay was purified and separated to obtain clay minerals with a diameter of less than 2µm, to study the physico-chemical properties of the clay by studying the FTIR, XDR, SEM analyses, the possibility of the adsorption by clay of a cationic dye (methylene blue) and another anionic (Congo red) as pollutants in aqueous solutions has been studied. The dependence on surface response modeling (RSM) under the change of the following factors: concentration, temperature and thermodynamic factors such as ΔG, ΔH, ΔS and adsorption kinetics were determined.

Keywords: Congo red; Nontronite; Methylene blue dye; Adsorption; Isotherm models.

References

Electrochemical degradation of methyl green in aqueous solution by oxidation process

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ABSTRACT

Wastewaters originated from various industry such as textile contain various polluants including a high content of organic matter and suspended masses and dissolved salts. Moreover, organic dyes used to dye cotton, acrylic, silk and wood are considered as widespread environmental pollutants. [1] In the case of textile industry, up to 50 % of the synthetic dyes with different structural varieties such as; azo, diazo, quinine imine, thiazole and others [2] are lost after the dyeing process and disposal out in the effluents [3]. Therefore, their elimination from wastewaters is an obligation to prevent the ecosystem destruction. Conventional wastewater treatment based on biological process is not suitably enough to remove recalcitrant dyes from effluents [4]. Physical and chemical methods used for eliminating dyes (i.e. adsorption, incineration, electrocoagulation, photocatalysis, ozonation and others) are reasonably effective but relatively cost. That’s why; it’s necessary to find an effective wastewater method capable of degrading toxic organic compounds from industrial effluents.

As alternative, the electrochemical oxidation process is a clean advanced oxidation technology because the main reagent; the electron, is a clean one [5]; it was applied successfully and proved to be convenient and fruitful to destruct bio-refractory organic compounds due to its high effectiveness and environment well-suited.

In this study, the electrochemical degradation of water methyl green on Pt electrodes was assessed in our particular conditions. The degradation rate have been evaluated with and without the redox mediator. The kinetics data shows first-order kinetics in the case of the indirect oxidation. A mechanism was advanced to explain the different phenomenon during the electrochemical process in both direct and indirect oxidation.

Keywords: electrochemical; oxidation; Wastewaters; polluants; degradation.

References

T4: Reaction Chemistry and Engineering
DFT Calculations for Corrosion Inhibition of heterocyclic compounds

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ABSTRACT

The corrosion of metals, including mild steel, is a serious problem in many industries, especially during processes such as the pickling of steel, acid washing and etching. One method of protecting it from corrosion is to use organic inhibitors, which are heterocyclic compounds containing P, S, O, or N and have p bonds. These hetero-atomic compounds can be seen as environmentally friendly corrosion inhibitors because of their characteristics of strong chemical activity and low toxicity[1,2].

In our work, the corrosion inhibition performances of three corrosion inhibitors on mild steel in acidic medium, were theoretically evaluated using quantum chemistry calculations by DFT/ 6-311G (d, p) and 6-31G (d, p) basis set implemented in the GAUSSIAN 09 software [3] in gas phase. The frontier orbital energy, global reactivity parameters. From the results we can reveal that, the theoretical calculations are in good agreement with the experimental results; where, the fraction of electrons (∆N) and molecule–metal interaction energy (∆ψ) obeying the following order: C2 > C1 > C3.

Moreover, the compound C2 favor its nucleophilic character because the trend of EHOMO: C2 > C1 > C3, which may be attributed to an inductive effect (electron-donating) of laterals methyl groups. Also, the negative sign of E_(b-d) indicates that back-donation to the inhibitor is energetically favorable[4].

Keywords: DFT, Corrosion Inhibition, heterocyclic compound, HOMO, LUMO

References

A DFT and molecular docking investigation of new Au (III) and Fe (III) based complexes as Anti-cancers.

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ABSTRACT

Many researchers have tried to overcome the limitations of clinical Cis-platin, which has led to several generations of platinum-based drugs that are derived from the Cis-platin matrix with a large number of molecules, but only five complexes have been approved. These latest generations of platinum-based drugs are rather important in chemotherapy, as they are often involved in the treatment of different types of cancer. Their use remains hampered by their severe toxicity, resistance to tumor cells, poor oral bioavailability as well as the repair of the resulting adducts, and the failure of the apoptotic pathways [1-6]. Different strategies are needed. To understand the structural, electronic, and spectroscopic properties of new Au (III) based complexes [7], a theoretical study of the density functional theory (DFT) and docking molecular is undertaken in this work using different functional and basis sets. If a good correlation is found between the various descriptors and the anti-cancer activity, it would probably indicate a better solution to substitute Au (III) with Fe (III), which is also an element commonly used in the manufacturing of drugs.

Keywords: DFT, docking molecular, Au (III) complexes, Fe (III) complexes, and anti-cancer.

References

Prediction of thermal Energy of aliphatic Aldehydes using QSPR approach and MLR technique

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ABSTRACT
An attempt has been made for the development of quantitative structure-property relationship (QSPR) models for a series of aliphatic Aldehydes tested for the thermal Energy Using the interpretable descriptors represented in the following blocks(2D frequency fingerprints), (atom centred fragments), (functional group counts), which represent the molecular structure, where it was calculated using Dragon software. The MLR method was employed to explore the correlation between these molecular descriptors, while the thermal Energy Eth(kcal/mol) is the property representation. The thermal Energy values for a set of 24 aliphatic Aldehydes were used for obtaining QSPR analysis and a group of multiple linear regression (MLR) models. The analysis of models building including 70% of computed data and 30% for test validation set compounds shows that selected descriptors have a good correlation with thermal Energy (Eth). The obtained results have shown that the descriptors type for each model could be used successfully for modeling and predicting the thermal Energy of aliphatic Aldehydes not used in this study.

Keywords: Aliphatic aldehydes; Multiple linear regression analysis; Computed molecular descriptors; QSPR; Statistical model.

References

Ibuprofen sodium salt sorption onto strongly basic exchange resin: IRN-78

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ABSTRACT

The usefulness of pharmaceuticals remains essential in our daily life. However, these products which are designed to be substances biologically active can also be a source of contamination. Particularly, non-steroidal anti-inflammatory drugs such as Ibuprofen (IBP), exert inhibition of certain functions in vertebrates and invertebrates [1]. Due to the widespread occurrence of this pharmaceutical in aqueous media, its potential for ecological impact has received great attention [2]. This work aims to study the performance of Amberlite resin IRN-78 for the retention of IBP sodium salt. Thus, isotherm, kinetics and thermodynamic investigations were discussed. The maximum adsorption capacity onto the IRN-78 was 1.266 mmol/g. The equilibrium data fit well to the Langmuir model. The thermodynamic study demonstrated that the adsorption of IBP onto IRN-78 was spontaneous and endothermic and the sorption process was controlled by physical mechanism rather than chemical mechanism [3].

Keywords: IRN-78, Ibuprofen, Adsorption, Isotherm modelling.

References

The present work includes a comparative molecular modeling study of a derivative of Tetrathiafulvalene (electron-π donor); using the method of density functional theory (DFT) and the quantum method of Hartree Fock (HF) with the same 6-31G (d,p) basis. We have identified geometric and structural parameters, energy parameters, and descriptors of local and global reactivity as well as nonlinear optics (NLO). This study allowed us to adopt the best method for the theoretical study of our compounds.

**Keywords:** Tetrathiafulvalene (TTF), Hartree Fock (HF), Density Functional Theory (DF)

**References**

Non-thermal plasma technology for biodiesel production: Mechanisms and reactors configuration.

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ABSTRACT

The necessity for the creation of renewable fuels is rising as a result of the energy problem and the pollution that fossil fuels produce. Diesel fuels may eventually be replaced by biodiesel, which is created when vegetable or animal oils and alcohols undergo a process called transesterification. However, conventional transesterification techniques are time-consuming, ineffective, and costly. The study was focused on finding possible reaction mechanisms and routes during the non-thermal plasma process. The main reactions within the plasma treatment were due to collisions between highly energetic electrons (supplied from a high-voltage power supply through a high-voltage electrode) and the reaction mixtures. High-energy electrons excited, dissociated, or even ionized the electron's pair of covalent bonds at higher energies. As a result, this non-thermal plasma system was promising for biodiesel synthesis from vegetable oils because only a short reaction time was required and, even without the use of a catalyst, no soap formation occurred and no glycerol by-product was produced. This system could produce a fatty acid methyl ester yield of 78.3 percent at 120 seconds and other possible chemicals, such as alkynes, alkanes, esters, carboxylic acids, and aldehydes. However, during the plasma process, the reaction mechanisms were still difficult to control due to the action of the high-energy electrons available.

Keywords: renewable fuels; non-thermal plasma; plasma reactor; Biodiesel production; transesterification.

References

Theoretical and crystallographic study of a new derivative α-sulfamidophosphonate

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ABSTRACT

A one-pot synthetic strategy was developed for the synthesis of a new sulfamidophosphonate via a three-component Kabachnik-Fields reaction of sulfanilamide, triethyl phosphite and benzaldehyde at using ultrasonic irradiation. The organophosphate derivative was synthesized in high yield by this developed method. The target compounds were characterized by 1H, 31P, 13C NMR and IR. The molecular structure was obtained by X-ray diffraction on the monocristal. Crystal belongs to the orthorhombic system with space groups Pbca. Insight into the binding mode of the synthesized compound (ligand) in SARS-CoV2 binding sites (PDF code: 5R80) was provided by molecular docking studies, performed using Maestro 9.0 docking software.

Keywords: α-sulfamidophosphonate, X-ray, molecular docking.

Figure 1: Ortep drawing and molecular docking of the compounds α-sulfamidophosphonate

References

Molecular docking on Deguelin analogues as inhibitors of Hsp90 protein

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ABSTRACT

Deguelin is a naturally occurring retinoid isolated from the African plant Mundulea sericea (Leguminosae), has been reported as a Heat shock protein 90 (Hsp90) inhibitor with potent apoptotic and antiangiogenic effects. Therefore, inhibition of HSP90 presented a promising therapeutic strategy for the development of new efficacious drugs to treat breast cancer by interrupting ATP binding to the HSP90 C terminus.

In this study, The deguelin analogues were docked within the active site region of Hsp90 using Molegro Virtual Docker. The results of molecular docking studies revealed that some analogues have higher Moldock score than Degelin. Further, in silico predicted ADME properties were investigated for the most promising molecules. The results of this study identified new possible inhibitors which have the potential to be developed into drugs, thus significantly contributing to the design and optimization of therapeutic strategies against cancer.

Keywords: Deguelin; Hsp90; Docking; Cancer; Inhibitor.

References

Synthesis, antimicrobial activity, molecular docking and ADMET study of novel N-acylsulfonamides

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ABSTRACT

Microbial resistance to drugs currently traded in the market is a serious problem in modern medicine. In this field of research, we synthesized a novel N-acylsulfonamides (NAS) derivatives starting from commercially available compounds; morpholine, isocyanate of chlorosulfonyl and alcohols1. The in vitro antimicrobial potential of synthesized compounds was screened against 04 Gram-negative bacteria; Escherichia coli, Pseudomonas aeruginosa, Klebsiella pneumoniae, Acinetobacter baumannii, 02 Gram-positive bacteria: Streptococcus sp, Staphylococcus aureus and 07 yeasts and fungi: Candida albicans, Candida spp, Penicillum spp, Aspergillus sp, Aspergillus flavus, Fusarium sp, and Cladosporium spp. The results of inhibition growth were compared with standard antimicrobial drugs with the goal of exploring their potential antimicrobial activity2. In addition, the obtained bioactivity results were further validated by in silico ADME and molecular docking studies.

Keywords: N-acylsulfonamide; molecular docking; antimicrobial activity.

References


Structure of N-acylsulfonamide
Investigation of intermolecular in inclusion complexes of Guanosine with hydroxypropyl-beta-cyclodextrin using DFT.

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ABSTRACT

In this work, the host-guest inclusion complexes of Guanosine (GuN) with hydroxypropyl-beta-cyclodextrin (HPCD) were investigated by the density functional theory (DFT) method using the following functional, B3LYP and M06-2X with the split valence double zeta 6-31G(d) basis set in both gas and aqueous phases.

The theoretical analyzes carried out by AIMNBO, QAIM and NCI made it possible to count and visualize hydrogen bonds and Vander Waals bonds explaining the stability of the two models.

Charge transfer between host and guest is the most important factor stabilizing the inclusion complex Guanosine/HP-\(\beta\)-CD; this is confirmed by NBO analysis.

Keywords: Guanosine, NBO, QTAIM, NCI and hydroxypropyl-beta-cyclodextrin.

References

Catalytic isomerization of light Naphtha (C5/C6) in the Penex unit of the Skikda refinery.

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ABSTRACT

Global regulations and standards for environmental protection strictly require low use of fuels with low lead and aromatic content. Among all the refining processes that must adapt to these obligations and produce gasolines with low Pb and aromatic product composition, the catalytic isomerization process of light naphtha stands out. To this end, the isomerization process is a fundamental process in refineries that generate clean fuels of simple and profitable technology, whose investment costs are minimized, for this reason, Catalytic isomerization offers a socio-economic and ecological impact around the industrial site. The purpose of isomerization is to convert linear normal paraffins into branched isoparaffins, minimize the aromatic content, as well as limit the lead fraction ,also this process is used to obtain high octane products and increase the efficiency of use [1]. In this work, we aimed to know the different modes of operation of the process and the different types of reactors and catalysts used throughout this operation as well as the conversion chemistry of Naphtha light and the different chemical reactions that occur in isomerization reactors. The low-octane light Naphtha supply is transformed into an isomerate with an octane number with an interval of 80 to 93 RON [2]. The objectif of our work is to study the cut-isomerization process (C5/C6) of the (701) Penex unit (UOP) of the Skikda refinery. This unit consists of two cylindrical fixed bed catalytic reactors, mounted in series. We were interested in selecting the right kinetic model to develop the mathematical model needed for this unit, while optimizing operating conditions to improve the production of gasoline and hydrogen.

Keywords: isomerization, paraffins, light Naphtha, octane number, mathematical model, bi-functional catalyst.

References

ABSTRACT

Molecular modeling can be considered as a range of computerized techniques based on theoretical chemistry methods and experimental data that can be used either to analyse molecules and molecular systems or to predict molecular, chemical, and biochemical properties [1], [2], [3].

Quantum chemistry methods play an important role in obtaining molecular geometries and predicting various properties [4].

In this study, QSAR models were developed using the MLR method for 23 benzimidazoles with activity anti-Alzheimer. The descriptors used were calculated by DFT/ B3LYP/6-31G' method in Gaussian09 program, Hyperchem, swissADME ... The prediction ability of these QSAR models were evaluated by (LOO) method. The second objective of our study was to use molecular modeling (docking molecular), to study the possible types of interaction between AChE enzyme and 23 benzimidazole derivatives. Finally, the pharmacokinetics of the compounds were predicted, i.e. the effect of the organism on the drug during its movement inside the body through 4 stages known as ADME, and this was done by studying the drug-likeness property, as well as predicting the probability of intestinal absorption (HIA) and Permeability across the blood-brain barrier (BBB).

Keywords: molecular docking, Anti-Alzheimer, QSAR, drug-likeness property, Benzimidazole.

References

Redox Dry Wet Gel Spinning of PVA HMW High Strength

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ABSTRACT

Manufacturing the sustainable, green, non hazardous, ecofriendly biomaterials for next decades requires modern biomedical engineering programs also called bio-based design methodologies or set-based design (SBD). Two factors strongly determine the properties of PVA as predicted by SBD: polymerization degree and hydrolysis (or saponification) degree. A wide range of PVA saponification degree values, provides access to a wide range of its stable physical forms: solution, slime, sponge, hydrogel, film, granular form, powder, and fiber. Versatility of PVA mechanical properties, tensile strength (σ) and Young’s modulus (E), place the field of use of PVA as a textile fiber respectively in the range \([0.3-1.2]\) GPa and \([3-40]\) GPa, while its stress strain (ε\% elongation) cannot exceed 7\%, draw ratio from 19 to 26. In this investigation, the use of Gel Permeation Chromatography GPC confirmed the obtaining of high molecular weights HMW, by the redox polymerization technique implemented. As well as the measurement of (σ), (E), and (ε%) by Zwick machine driven by TestXpert software showed the compatibility of the results obtained with the standards for the preparation of biomedical fibers that constitute a strategic database to be exploited by engineering design computing.

Keywords: Biomaterials; Polyvinyl alcohol; GPC; FTIR; Zwick machine.

References


Microstructure and mechanical properties of Fe based alloy prepared by mechanical milling

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ABSTRACT

Textile industries consume a large amount of water and produce a remarkable amount of wastewater containing pigments, dyes, and non-expendable components. The nanomaterials range in size from a few nanometers to less than 100 nm can potentially solve several environmental problems. Nanomaterials come in a variety of forms, including nanowires, nanotubes, films, particles, colloids, and quantum dots. Nanophotocatalysts, nanoreductives, nanomembranes, and nanosorbents are the four main types of nanomaterial that can play a crucial part in the wastewater treatment process. The distinctive attributes of nanomaterials, such as their high surface area, large pores, high reactivity, strong mechanical properties and hydrophobic/hydrophilic characteristics, have been demonstrated by researchers to be suitable candidates for wastewater technology.

Therefore, the purpose of the present work is to preparing Fe based nanocrystalline powders by mechanical milling process (MA) and investigate the improvement of mechanical properties and surface area with the time milling.

Keywords: Milling; Nanostructures Materials, Annealing, DSC, X-ray Diffraction
T5: Biodiversity
Study of effective products and biological properties of *Bunium mauritanicum*, which grows in the high plains of Algeria.

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**ABSTRACT**

*Bunium mauritanicum* (Talgoda) is a medicinal plant belonging to the Apiacetic family used in traditional medicine. The main objective of this study was to determine the effective products and biological properties of the plant according to the following areas: Om El Bouaghi, Souk Ahras, Bordj Bou Arreridj, and El Beidh.

In this study, we were able to identify the most important natural products through detection, extraction, and then the quantitative estimation of phenolic compounds by UV-Visible. through this study, we found that the tuber of the *Bunium mauritanicum* plant is rich in secondary metabolites represented in phenols, flavonoids, and alkaloids….in varying proportions. We recorded the yield of phenols in the Om El Bouaghi region estimated at 6.49%, which was the highest value, while for the Souk Ahras region, it was the lowest value estimated at 2.39 %, while the percentage of alkaloids was the highest value at 19.96 % in the egg area, and the antioxidant activity was also determined. The phenolic extract of the Bordj Bou Arreridj region showed great effectiveness in inhibiting the free radical DPPH estimated at IC$_{50}$ = 0.130 mg/ml, and for the cyclic voltammetry test, it was the highest value estimated at 157.4 mg EAG/g for the Om El Bouaghi area.

As the last step, the antibacterial activity of these extracts was tested on two pathogenic bacterial strains, and the results were positive in all phenolic extracts at the highest concentration of 10 mg/ml for the two strains of *E. coli* and *Staphylococcus aureus*, where the largest diameter was 16 mm. For the phenolic extract of Om El Bouaghi region *E. coli* strain *Staphylococcus aureus*, the highest estimated transduction diameter was recorded at 14mm.

Finally, we conclude that there is a direct relationship between yield and biological activity, meaning the higher the yield rate, the greater the antibacterial activity and antioxidant activity (DPPH).

**Keywords:** *Bunium mauritanicum*, effective products (phenols, flavonoids, alkaloids ) biological efficacy (anti-oxidant activity, anti-bacterial activity).

**References**

5. BAKRI Samah, DILMI Fatima zohra (2020). Etude ethnobotanique de la plante medicinale *Bunium Mauritani*um (Talghouda) dans la région de M’sila.
Effects of the combination of natural extracts on their antioxidant activity

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ABSTRACT

The antioxidant activity of the extracts of 6 medicinal plants was studied by combining extracts 2 to 2. The polyphenols were tested by the folin ciocalteu technique then the evaluation of the antioxidant activity was carried out, with respect to the radical synthetic DPPH, for extracts alone and in combination. The extracts alone exhibited significant antioxidant activities. They approach 80% inhibition of the DPPH radical for the extracts of Myrtus communis and Pistacia lentiscus, and give values between 60 and 75% for Urtica dioica, Lavandula stoechas, Inula viscosa and Tocrium polium. The combinations of extracts resulted in a synergy for the associations: Pistacia lentiscus and Myrtus communis, Pistacia lentiscus and Tocrium polium, Urtica dioica and Inula viscosa, Myrtus communis and Inula viscosa, Urtica dioica and Lavandula stoechas. However, the association Inula viscosa and Tocrium polium gave an antagonistic effect. Most combinations exhibited a synergistic effect which is sought after in therapy.

Keywords: Medicinal plants, associations, antioxidant effect, polyphenols, synergy
Lignans from \textit{n}-butanol extract of aerial parts of \textit{helianthemum sessiliflorum}

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ABSTRACT

Large numbers of species of genus \textit{Helianthemum} (Cistaceae family) are widely used in traditional medicine due to their notable pharmacological effects as analgesic, phytoinhibitrice, antioxidant, antimicrobial, antiprotozal, antigiradial and antibacterial. \textit{Helianthemum sessiliflorum} Pers. is one of species of this genus that showed previously anti-inflammatory and analgesic activities. In addition, the aerial parts of this plant are recommended in folk medicine in case of cutaneous lesion.

The \textit{n}-butanol extract of aerial parts of \textit{H. sessiliflorum} afforded nine known phenolic compounds where majority of them were isolated for the first time from the family Cistaceae. The results obtained from the present study, together with our previous investigation of the ethyl acetate extract from the same parts of this plant will be helpful for the chemotaxonomic profile of the \textit{Helianthemum} genus. The structural identification of the isolated compounds was achieved using several spectroscopic methods.

Keywords: \textit{Helianthemum sessiliflorum}, Cistaceae, lignans, \textit{n}-butanol extract, NMR.

References

ABSTRACT

Saccocalyx satureioides Coss. & Dur., an endemic species of Algeria, is a small aromatic shrub growing in Sahara septentrional and belonging to the family Lamiaceae (1). It has attracted a great attention due to its traditional medicinal usage for gastric disorders and spasms (2). The essential oil of S. satureioides has been extensively investigated and revealed the presence of numerous oil components, which possess interesting biological activities (3). However, a literature survey reveals that there is only one study describing the isolation and structural elucidation of phytochemical components of this plant (4).

The TLC profile of the different extracts (light petroleum, CHCl$_3$, EtOAc and n-BuOH) obtained from S. satureioides revealed the especial richness of EtOAc extract in phytochemicals compared to the other extracts, and this is the reason why our phytochemical study is focused on this extract.

This study led to the isolation and identification of one new acylated indole alkaloid glucoside 1 and eight known compounds, including two indoles 2 and 3, five methylated flavone aglycones 4-8 and one monoterpene glucoside 9.

The structural elucidation of these compounds was accomplished by spectroscopic methods including 1D (1H and 13C) and 2D (COSY, HSQC and HMBC) NMR techniques, and mass spectrometry, and by comparison with literature data.

Keywords: Saccocalyx satureioides; Lamiaceae; Indole alkaloids; Terpene; 1D and 2D NMR.

References

Analysis of Floristic Biodiversity of the Afghan Djebel Cedar Grove

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ABSTRACT

The Atlas cedar (\textit{Cedrus atlantica} Manetti), an endemic species in Algeria and Morocco, is of particular interest and important for its resistance to climate variations and its low flammability. Our study of the floristic diversity of the series of vegetations in \textit{Cedrus atlantica} was conducted in Afghan is located in the center of the state forest of Boutaleb on the north side. To obtain a good overview of floristic diversity and the heterogeneity of the plant formations present, 26 phytocoecological surveys were carried out on relatively homogeneous surfaces in the study area. The floristic diversity Djebel Afghane shows that the specific richness represents 104 species divided into 29 botanical families and 25 chorological types and 7 biological types.

Keywords: biodiversity, djebel Afghane, floristic succession

References

ABSTRACT

The increase in greenhouse gas emissions caused by global industrial development leads to the search for alternative energy sources to fossil fuels, this is deployed by the progressive concern caused by the reduction of non-renewable energy resources. Biomass energy production is an efficient technique for converting sustainable resources into climate-friendly energy. Furthermore, the Balanites (heglig) or Desert Date Palm referred to in this work is the African species known under the botanical name of Balanites aegyptiaca, known in southern Algeria under the name of Tougua. It is a very widespread tree on the African continent. Currently, biotechnological processes make it possible to valorize this fruit of the date palm of the desert and to make available to the citizen a new generation of products with high added values such as bioethanol.

Dans ce contexte, différents essais de fermentation alcoolique sont réalisés au niveau du laboratoire pour déterminer le taux de dilution, dans le but d'optimiser le procédé. On compare le degré d'alcool brut de quatre dilutions soit la dilution (pulp/water) par (7, 9, 10 et 11 fois) de la masse (110) g de pulpe de fruit de Balanites. The results obtained showed that the 10 times dilution (pulp/water) gave the best yield: the volume of 35 ml at a concentration of 64 degrees of alcohol.

Keywords: Energy recovery, Balanites aegyptiaca, alcoholic fermentation, bioethanol.

References

Antibacterial activity of *Pulicaria odora* extracts

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**ABSTRACT**

The objective of this work is to highlight the antibacterial activity of extracts from leaves and roots of a plant belonging to the Asteraceae family: *Pulicaria odora*. Three solvents of different polarities (methanol, acetone and chloroform) are used for the extraction of phenolic compounds. Methanol is the best solvent for extracting phenolic compounds. The methanolic leaf extract recorded the highest contents of total polyphenols (90 μg CE/g DM) and flavonoids (11.34 μg QE/g DM). The antibacterial activity of the extracts showed that the bacterial strains tested are sensitive to the extracts of *Pulicaria odora*. Gram-positive bacteria (*B. subtilis* and *S. aureus*) are more susceptible than Gram-negative bacteria (*E. coli* and *P. aeruginosa*). The results showed that *S. aureus* is the most sensitive strain, with the largest diameter of inhibition (30.5 mm) obtained by the acetone extract of the root. While *P. aeruginosa* was more resistant, with no zone of inhibition for the leaf chloroform extract. The methanolic leaf extract is more active against *S. aureus* and *P. aeruginosa* with MIC/MBC equal to 1/1.4 mg/ml.

**Keywords:** Antibacterial activity, *Pulicaria odora*, phenolic compounds, *S. aureus*, *E. coli*.

**References**

In vitro inhibition of urolithiasis by secondary metabolites extracted from Quercus ilex leaves

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ABSTRACT

Medicinal plants are used all over the world to treat different types of human and animal diseases. one of these plants is the specie Quercus ilex. the objective of this study is to evaluate in vitro the antiurolithiatic activity of secondary metabolites extracted from Quercus ilex leaves by a spectrophotometric method based on the turbidimetric model. the comparison of the turbidimetric slopes without and with inhibitors at different concentrations, indicates that the saponins metabolite fraction is the most effective inhibitor (87.65%) at 100% concentration compared to the alkaloid fraction which gives an equal 79.91% inhibition, on the other hand the positive control (sodium citrate) gives a weak inhibition (44.89%) at a concentration of 0.25mmol/l. FTIR spectra of crystals precipitated without inhibitor indicate formation of calcium oxalate mono and dihydrate crystals in the range of 600 to 4000 cm⁻¹. It can be clearly seen that the saponins fraction has introduced high intensity in the range of 1300 to 1650 cm⁻¹.

Keywords: Quercus ilex; Saponins; Alkaloids; Urolithiasis, Turbidimetric model.

References

1. Bensatal A, Ouahranie MR. Inhibition of crystallization of calcium oxalate by the extraction of Tamarix gallica L. Urol Res. 2008, 36:283–287. DOI: 10.1007/s00240-008-0157-1
Effect of Heat Treatment on the Antioxidant Activity of Zygophyllum album L Honey

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ABSTRACT

We determined how the antioxidant activity and total phenolic content of honey changed after being subjected to a high temperature. Antioxidant activity was determined using two methods – FRAP (ferric reducing antioxidant power) and DPPH (1,1-diphenyl-2-picrylhydrazyl) assays\cite{2}. Total phenolic content was determined by modified Folin-Ciocalteu method\cite{3}. The research was conducted on 5 samples of Zygophyllum album L honey. All measurements were done at different temperatures (25, 50, 70, 80 and 90°C) on honey samples during of (3–12 h) time range. The obtained results show uneven changes of antioxidant activity and total phenolic content among individual samples, in some samples antioxidant activity decreased after heating, while in others it increased. The same applies to the total phenolic content. 

Keywords: Zygophyllum album L; Honey; High temperature; Phenolic; Antioxidant.

References

1. Benzie IF, Strain JJ. The ferric reducing ability of plasma (FRAP) as a measure of "antioxidant power": the FRAP assay. Anal Bio-chem (1996); 239(1): 70
2. Ferreira IC, Aires E, Barreira JC, Estevinho LM. Antioxidant activity of honey samples: Different contributions of the entire honey and phenolic extract. Chem (2009); 114(4): 1438
Essential Oils Extracted from Algerian Highlands Medicinal and Aromatic Plants: Yields, Organoleptic Qualities, Chemical Composition and Antibacterial Activities against *E. coli* ATCC 25922 and *Pseudomonas aeruginosa* ATCC 27853

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**ABSTRACT**

Aiming to research a possible antibacterial activity of some Algerian essential oils, we worked on the essences of Rosemary (*Rosmarinus officinalis* L.), Thyme (*Thymus vulgaris* L.) and Coriander seeds (*Coriandrum sativum* L.). These three aromatic and medicinal plants, belonging to the Djelfa region (Central part of the Algerian highlands), were chosen for their reputation as antimicrobial agents by excellence. Following the extraction of these oils, by using hydrodistillation, the yields and organoleptic qualities of each extract have been determined. After what, the chemical compositions of the essential oils were determined by Gas Chromatography coupled to Mass Spectrometry (GC-MS). Finally, the antibacterial activities were evaluated by carrying out aromatograms against two reference strains, that of *E. coli* ATCC 25922 and that of *Pseudomonas aeruginosa* ATCC 27853. Concerning the results obtained, the essential oil of Thyme presented the best yield (01.22±0.26%). For GC-MS analysis, the principal components were represented by "1.8 Cineole" (39.75%) for Rosemary essence, "Carvacrol" (73.03%) for Thyme essential oil and "Linalol" (60.91%) for Coriander seeds oil. In regard to *E. coli* ATCC 25922, the aromatograms concluded that the essence of Thyme was the most active essential oil (general average of the diameters of the zones of inhibition estimated at 33.16±0.711mm). *Pseudomonas aeruginosa* ATCC 27853, when to her, has proven to be more resistant to the antibacterial action of the three oils mentioned before. Indeed, the most important antibacterial activity, which was only represented by a very weak one (10.93±0.622mm), was that exerted by the essential oil of Thyme. These results would mean that the oils studied, and more precisely that of Thyme, would be more interesting to use during infections caused by *E. coli*, studies carried out, In vivo, should be undertaken to confirm or invalidate these results.

**Keywords:** Antibacterial activity; Algerian essential oils; Rosemary; Thyme; Coriander seeds.

**References**

Systemic immunity in apple is activated by the deployment of sugar against codling moth (Cydia pomonella L.) in semi-arid region (Batna, Algeria)

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ABSTRACT

The codling moth (Cydia pomonella L.) causes considerable damages and fruits are usually unmarketable in apple fruit orchard in Algeria. In order to control this pest, the number of codling moth treatments ranges from 7 to 8 during one growing season in Algeria. Induced resistance in plants against insects and diseases represent a promising alternative to pesticides in crop protection. New concept of “sweet immunity” where sugars are widely accepted as players in plant innate immunity. Our objective here is to show the possibility of using sucrose and fructose, alone or associated, at 100 ppm and 50 ppm, against C. pomonella in “Anna” apple variety orchard in the region of Tilatou (Batna, Algeria). The entire experimental plot was treated from the end of flowering stage till the harvest, every 21 days, before 7:00 a.m., on the whole tree. Comparing mean percentages of damaged fruits per tree at harvest, fallen fruits and number of larvae collected in corrugated cardboard placed on tree trunk. The results of this study showed that all tested modalities reduced damaged fruits by C. pomonella. At harvest, treatments by sucrose and fructose alone provide percentages of damaged fruits at rate of 09.82±0.74% and 11.17±0.30% respectively, vs. 29.23±1.16 for untreated trees, and provided the best efficacy with 66.49% and 61.68% respectively. The treatments affected also the number of larvae caught; the application of sucrose alone reduced the number of diapausing larvae per band and provides the best efficacy, with an efficacy up to 77.67%.

Keywords: Cydia pomonella, Apple, Damage, Sugar, Systemic immunity.

References

Preliminary analysis of the chemical composition of a hydram-acetone extract of Algerian propolis

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ABSTRACT

Propolis is a resinous substance produced by bees, containing bioactive compounds that exert pharmacological actions. Few studies are available in the literature concerning the chemical composition of Algerian propolis (AP). In order to study the chemical composition of AP samples, a hydram-acetone extraction was performed. Then the composition was estimated using HPLC-MS/MS which allowed us to find phenolic compounds such as flavonoids and tannins.

Keywords: Algerian propolis; HPLC-MS/MS; Extraction.

References

3. Anna Lisa Piccinelli et al., Chemical Composition and Antioxidant Activity of Algerian propolis, Journal of Agricultural and Food Chemistry; 2013.
Neutrophil Extracellular Traps (NETs) modulation using natural bioactive compounds

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ABSTRACT

Neutrophil Extracellular Traps (NETs) are the newest discovered innate immune response against pathogens. It consists of a DNA backbone decorated with multiple bactericidal proteins/peptides from the nucleus, cytoplasm, and azurophil granules. NETs release occurs after the activation of neutrophils by several physiological and pharmacological stimuli. Despite this beneficial effect, NETs are believed to play an important role in the pathogenesis of autoimmune and inflammatory disorders such as rheumatoid arthritis, systemic lupus erythematosus, and psoriasis. Accordingly, suppression/modulation of NETosis should be a potential therapeutic strategy. Since the NETs release is mainly dependent on reactive oxygen species production (ROS), due to the activation of NADPH oxidase complex and myeloperoxidase (MPO), using molecules that are able to scavenge ROS or inhibit the enzyme responsible for their synthesis should be considered. The aim of this study is to assess the effect of Oleuropein and Tyrosol on NETs release. The effects of these molecules were evaluated by fluorometric and cytochemical labeling assays on neutrophils extracted from healthy volunteers.

Our results showed for the first time the inhibition effect of Oleuropein and Tyrosol on NETs release. A decrease in the level of cell-free NETs (DNA in culture supernatant) was observed. Besides, we noted a decrease in the level of anchored NETs formation as determined by fluorescence microscopy. This result may be explained by the ROS scavenging activity of the two tested molecules as determined by chemiluminescence. Taking into consideration these results, antioxidant molecules such as Oleuropein and Tyrosol should be recommended in the therapeutic strategy of autoimmune and inflammatory diseases.

Keywords: Neutrophil Extracellular Traps (NETs), ROS, Antioxidant molecules, Autoimmune diseases, Oleuropein, Tyrosol.
In vitro potential anticancer activity against HeLa and MCF-7 cancer cell lines and lipid peroxidation effect of GC-MS compounds of *Punica granatum* peel essential oil

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**ABSTRACT**

*Punica granatum* is one of the most common and traditional herbs used among Mediterranean people to prevent and treat certain diseases, is a rich source of bioactive compounds that exhibit various biological effects. The aim of this study is exploring a numerous biological activity of *Punica granatum* peel essential oil. The essential oil from the *Punica granatum* peel (PEO), was extracted by hydrodistillation, was screened for chemical antioxidant activity by the DPPH and NO free radicals scavenging assay and the Ferric Reducing Power Assay (FRAP). The cytotoxicity activity of PEO was assessed using MTT assay against HeLa and MCF-7 cells lines. The secondary lipid peroxidation products were evaluated by measuring malonaldehyde (MDA) and conjugated dienes (DC) levels in both tumor cell line. Our results show a strong inhibition percentage (77% and 85%) on DPPH and NO scavenging assays respectively, and a high ferric reduction power activity (91%) at 1 mg/mL comparable to standards. A significant increase of the cytotoxicity effect with the *P. granatum* peel essential oil’s concentrations was noted on HeLa and MCF-7 cell lines, with IC50=93µg/ml and IC50=25µg/ml respectively. The H2O2 induction on tumor cells line highlighted a significant rise in the lipid peroxidation level adduct, conversely, our data showed a decline of MDA level (p < 0.01) and a significant reduction in DC levels (p < 0.05) in the essential oil treated cells. The treatment with the PEO generated a significant decrease in the MDA and DC levels on both cells’ lines. A correlation analyses showed a significant positive relationship between the antioxidant power and the cytotoxicity of *P. granatum* essential oil effect. Pomegranate essential oil exhibited a potent antioxidant activity, has a significant antitumor effect and has the interest role of a lipid peroxidation scavenger. *P. granatum* might be used as a natural compound to fight the oxidative stress and as alternative therapeutic agent to prevent cancer.

**Keywords:** *Punica granatum* essential oil; HeLa; MCF-7 antioxidant; anti-proliferative; lipid peroxidation
Evaluation of bioactive contents, antioxidant and anti-proliferative activities of acetate extract of Fagonia longispina

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ABSTRACT

Cellular damage caused by reactive oxygen species (ROS) has been implicated in several diseases. Natural antioxidants have significant importance in human health. Recent investigations have shown that the antioxidant properties of plants could be correlated with oxidative stress defense and different human diseases and aging process etc. The aim of this study was to assess the in vitro potential of acetate extract of Fagonia longispina as a natural antioxidant. The DPPH scavenging activity of the extract at different concentrations (2.5–50 µg/ml) was increased in a dose-dependent manner with an IC\textsubscript{50} found to be 37.82 ± 7.83 µg/ml. Also, the extract demonstrated the ability to inhibit the formation of TBARS in a concentration-dependent manner and the IC\textsubscript{50} was found to be 126.66 ± 2.35 µg/ml, in each of these assays, ascorbic acid was used as a reference substrate. Measurement of total phenolic and total flavonoids contents of acetate extract of Fagonia longispina were achieved using Folin-Ciocalteau reagent and AlCl\textsubscript{3} respectively. The results showed that this extract containing 377 µg of gallic acid equivalents/mg extract and 87.14 µg of quercetin equivalents/mg extract respectively. The study also was designed to assess the role of Fagonia longispina by using xCELLigence Systems in Hela (human cervix carcinoma) and HT29 (human colorectal adenocarcinoma) in vitro cells culture model. Therefore, this study confirmed that this acetate extract is a potent source of beneficial antioxidant, also showed antiproliferative activity against HeLa and HT29 cells.

Keywords: Fagonia longispina, phenolic compound, anti-proliferative activity, Antioxidant activity, Lipid peroxidation.
Oxidative stability of soybean oil induced by the essential oils from stems and flowers of *Pituranthos scoparius*

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**ABSTRACT**

This work aims to utilize the essential oils of the Pituranthos (*Pituranthos scoparius*). In this regard, an extraction of essential oils by hydrodistillation was carried out on the stems and flowers of the plant. Extraction yields of (1.81 ± 0.01)% for flowers and (1.81 ± 0.01)% for stems were obtained. The antioxidant activity was expressed in terms of inhibition concentrations at 50% (IC50) for the different tests carried out: \(\beta\)-carotene bleaching test (1.40 ± 0.08) and (0.45 ± 0.08) \(\mu\)g/mL for stems and flowers respectively. DPPH\(^*\) test (4.37 ± 0.26) (stems) and (5.32 ± 0.86) (flowers) \(\mu\)g/mL and ABTS\(^*\) test (4.77 ± 0.36) (stems) and (4.46 ± 0.33) (flowers) \(\mu\)g/mL. The oxidative stability test, by the SHAAL test, was applied to soybean oil alone and soybean oil at different concentrations of essential oils added (50 ppm, 100ppm and 150 ppm). The samples with the concentration of 150 ppm depicted the best resistance to the forced oxidation, while those with the concentration of 50 ppm had less resistance but resisted better than the blank. The essential oil of *P. scoparius* may be an interesting candidate as an antioxidative agent in vegetable oils.

**Keywords:** essential oils, stems, flowers, antioxidant activity
Evolution of Phenolic Compounds During Maturation of the Deglet-Nour Variety

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\textbf{ABSTRACT}

Date polyphenols can be used in the food industry as antimicrobial agents and natural antioxidants to replace controversial synthetic antioxidants to extend food shelf life. The objective of this study is the evaluation of the antioxidant potential of methanolic extracts of a variety of Algerian semi-soft dates (Deglet-Nour) during four stages of maturation (Kh'lal, Bser, Martouba and Tamr). In this study, we were interested in the determination of the content of total polyphenols (Folin-Ciocalteu's method), flavonoids (AlCl\textsubscript{3} method) and the evaluation of the antioxidant activity of phenolic extracts by the DPPH test. The results obtained show that the Kh'lal stage has the highest total polyphenol content (517.56 mg EAG/100 g fresh weight), while the two Bser and Martouba stages have the lowest levels (63.72 to 79.06 mg EAG/100 g fresh weight). The Bser stage has the lowest flavonoid content (3.41 mg EQ/100 g fresh weight), while the highest content (21.97 mg EQ/100 g fresh weight) is observed at the Tamr stage. The results obtained also show that the evolution of the antioxidant activity of the methanolic extracts during the maturation of the variety studied follows the same pace as the evolution of the polyphenol content. At the first and last stages (Kh'lal and Tamr), the methanolic extracts rich in phenolic compounds show a higher scavenging capacity for DPPH radicals than those of the poor extracts of two intermediate stages, Bser and Martouba. The correlation matrix shows that there is a highly significant correlation between the content of phenolic compounds (total polyphenols and flavonoids) and the free radical scavenging activity (DPPH\textsuperscript{•}) of the methanolic extracts during maturation of the Deglet-Nour. This strong correlation confirms that polyphenols are powerful antioxidants capable of inhibiting the formation of free radicals and opposing the oxidation of macromolecules.

\textbf{Keywords:} Deglet-Nour, Stages of maturation, Methanolic extract, Polyphenols, Antioxidant activity.

\textbf{References}

The First International Seminar on Catalysis, Chemical Engineering & Green Chemistry

Effects of plowing tools on the yield of a durum wheat crop after having their effect on the properties of the soil (region of Timгад Batna).

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ABSTRACT
This study follows in the context of the practice of different types of fallow (cereal stubble, worked fallow and bare fallow) and the type of tool used for plowing (disc plow or cultivator) and the effect of the interaction of these two factors on the evolution of certain physical properties of the soil, as well as the impact of these two factors (previous crop/plowing tools) on the behavior of a cereal (durum wheat variety MBB) under a semi-arid climate in the region of Timгад (W Batna). The effect of the interaction (previous crop / tool) is measured more particularly from the evolution of the soil structure (Da), of the pore space and the hydrodynamic functioning of the water in the plowed horizon. This showed differences between the treatments obtained. The improvement of the soil structure leads to favorable consequences for the installation of the root network is observed for all the treatments. Changes in the density of solid particles of the surface horizon (Da) are characterized by the treatments (cereal stubble / disc plow). The best value of the total porosity of the plowed horizon is recorded at the level of treatments (worked fallow/disc plow). These same observations are noted in the study of the water properties of this horizon. Monitoring the growth and yield of the wheat crop explains the role of the combination (tilled fallow / disc plough) in the establishment, growth and grain yield of this crop. The results obtained can constitute a basis for advice to farmers concerning the practice of fallowing and the type of tool to be used for tillage in semi-arid regions.

Keywords: Crop history, tillage tools :Bulk density ,porosity , Water retention capacity ,wilting point, durum wheat – yield.

References
Antioxidants Activities of Extracts of White Wormwood

*Artemisia herba alba*

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ABSTRACT

The objective of this study is the quantification of total polyphenols from white wormwood (*Artemisia herba alba*) extract and the determination of their antioxidant power by DPPH and ABTS assay. The extraction of total polyphenols was performed by a methanol/water mixture (80:20), with 1/20 ratio (Weight/Volume). Total polyphenols was determined by colorimetry at 765 nm, using the Folinicocalteu reagent. Flavonoids were measured by the formation of a yellow complex with aluminum nitrate, the color intensity is measured at 415 nm. The antioxidant activity is evaluated by free radical scavenging methods using both tests: DPPH and ABTS. The antioxidant activity of the extract was compared to a synthetic antioxidant BHT. The kinetics curves allowed to determine the concentrations that correspond to 50% of inhibition (IC50). The wormwood extract total polyphenol content was about 136.7 µg/1 mg, of which 35.3 µg are flavonoids. The plant extract showed antiradical activity towards DPPH and ABTS, whose IC50 concentration was respectively 33.22±0.72 µg/1ml and 56.54±0.62µg/1ml. The plant extract is less potent compared to BHT standard, with an IC50 concentration of 12.99±0.41 µg/1ml for DPPH and 1.29±0.30 µg/1ml for ABTS. From those results, wormwood extract is rich in phenolic compounds. It is endowed with interesting antiradical properties which present wide perspectives in food and pharmaceutical industries.

Keywords: White Wormwood (*Artemisia herba alba*), total polyphenols, flavonoids, antiradical activity, DPPH, ABTS.

References

Cleaning the natural environment from petroleum substances using Green Technology

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ABSTRACT

In phytoextraction, the key problem is contaminated plant biomass, but also the selection of appropriate plant species that are resistant to pollution, as well as the time needed to completely clean the soil. The aim of the research was to select an appropriate method for the reclamation of soils contaminated with polycyclic aromatic hydrocarbons (PAHs). What is needed is a quick, environmentally friendly, and economical method of removing and minimizing the dangerous impact of crude oil on the natural environment and restoring soils for agricultural use [1,2]. The research was conducted in the period 2018–2019 on the grounds twelve localities, in the area of crude oil extraction, in South-Eastern Poland.Descriptive, experimental, laboratory and comparative methods were used [3,4]. Results: Soil contamination with PAHs, which can cause mutations and cancers, this is of particular dangerous because it affects not only human health, but also vegetation growth and the biological environment. Plant species adapted to soils contaminated with PAHs, characterized by high resistance to these substances, were selected. Species resistant to unfavorable conditions of the soil environment in the area of the former and present oil industry include such species as: white clover, red clover, trefoil, creeping bent., red fescue, French ryegrass. These grades fulfilled their tasks very well, therefore they can be recommended for use as a factor counteracting the degradation of the natural environment. The vegetation cover ensures a positive course of plant succession and intensive development of bioecological processes, and the plants analyzed in the research well prepare post-mining areas unsuitable for agricultural use. Biological treatment methods are cheaper, easier to use, and more effective, and reclaimed soils show properties similar to those of uncontaminated soils. Due to the random selection of soil sample collection areas, the need to conduct further, more precise research and develop an appropriate systematic sampling scheme should be considered.

Keywords: bioremediation, plants, pollution, phytoremediation, soil contaminated with hydrocarbons

References


In Vitro Anti-inflammatory Activity and chemical composition of Essential Oils from Smyrnium olusatrum L. from Algeria

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ABSTRACT

Smyrnium olusatrum L. commonly known as wild celery, is a forgotten vegetable that has now been replaced by celery. The present work investigated the chemical composition by GC-MS chromatography of the essential oils of Smyrnium leaves and stems obtained by hydrodistillation and their anti-inflammatory effect against the albumin denaturation. Chromatographic analyzes revealed that diethyl 3-oxopentanedioate eucalyptol, nickle tetracarbonyl were the main components, respectively. The present findings exhibited a concentration dependent inhibition of protein denaturation by the plant essential oils. The effect of diclofenac sodium was found to be less when compared with the test extract at concentration of 1mg/mL. From the present study it can be concluded that Smyrnium olusatrum L. possessed marked in vitro anti-inflammatory effect against the denaturation of protein.

Keywords: Smyrnium olusatrum L., essential oils, GC-MS, anti-inflammatory.

References

The influence of temperature on the kinetics of antioxidant activity and phenolic compounds in extracts of *Origanum majorana* grown in El Oued (Algeria)

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ABSTRACT

The aromatic plant that goes by the name *Origanum majorana* is the source of an essential oil that is later used in the treatment of a broad range of conditions. In this specific piece of study, one of our goals is to investigate the pharmacological effects that are associated with the use of extracts from *Origanum majorana*. The quantity of phenolic compounds that were present was determined with the use of colorimetric methods. On a microplate with 96 wells, tests for antioxidant and antidiabetic activity were performed. The ethanol extract has the most total phenolic (296.34±5.28µg GAEmg), followed by the chloroform and hexane extracts. The ethanol extract has the most flavonoids, flavonols, and condensed tannins. In contrast, the *Origanum majorana* extracts were tested as antioxidants utilizing DPPH and ABTS as artificial radicals. IC50 for the ethanol extract was 19.27±0.68mg/mL. IC50 values for hexane and chloroform extracts were 32.79±1.81mg/mL and 64.65±0.98mg/mL, respectively. IC50 values for ethanol and chloroform extracts were 18.02±3.81 and 22.41±2.1mg/mL, respectively. IC50 for hexane extract was 47.11±0.94mg/mL. The ethanolic extract of the *Origanum majorana* plant was evaluated in terms of total antioxidant activity by the DPPH test. The kinetics of changes in *Origanum majorana* samples heated at different temperatures (45, 50, and 60 °C) over one hour were studied. The results showed that increasing the treatment temperature and time increased all factors, including, the antioxidant activity and the variation of the rise in the antioxidant activity depending on the heating temperatures and time. The results showed that all extracts significantly displace the DPPH root, as it was found that heating the marjoram extract to 60 °C for 30 minutes is more effective than heating to 45 or 50°C.

Keywords: *Origanum majorana*, extracts, DPPH test, antioxidant.

References

Polyphenol content and antimicrobial activity of olive oil from semi-arid area in Algeria

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ABSTRACT

Many recent studies show the positive effect of phenolic compounds in olive oil on health. They are known for their biological properties, where they have shown potential activity as antioxidant, anti-inflammatory, and antimicrobial agents. However, this characteristic is rarely studied on olive oil from semi-arid area of Algeria.

Different samples collected from different region in Tissemsilt (Western of Algeria) were evaluated for their polyphenol content and their antimicrobial effect. The obtained results demonstrated that this oil is rich in polyphenols and revealed high antioxidant activity and antimicrobial activity against Staphylococcus aureus and Escherichia Coli.

This study disclosed the nutritional and pharmaceutical importance of olive oil grown in Algeria specially in the western region.

Keywords: Olive oil; polyphenols; antioxidant activity; antimicrobial activity.

References


Artemisinin and Crystal purity Evaluation in Algerian Artemisia spp wild plant using HPLC method.

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ABSTRACT

Artemisinin, a sesquiterpene lactone from Artemisia, has received considerable attention in the last few decades as a potent antimalarial drug. This study reports the presence of Artemisinin in three Algerian wild Artemisia species (A. herba Alba, A. campestris and A. judaica) quantified by HPLC method. In the selected optimal experimental conditions, HPLC chromatograms of the plant samples showed many resolved peaks. Artemisinin exhibited a well-defined chromatographic peak with a retention time between 7.46-8.15 min for all three Artemisia species. The peaks were identified by comparison of their retention times to that of standard artemisinin. Linear regression was used to establish the calibration curve and the good linearity of artemisinin was found within the range of 0.125 – 2.5 mg/mL (R^2 = 0.99854). The regression equation and correlation coefficient were determined as Formula: y = mx + b.

The HPLC analysis of the hexane extracts showed a difference in artemisinin content in studied species with a yield of 0.64%, 0.34% and 0.04% for AC, AH and AJ, respectively. Moreover, the level of artemisinin obtained in A. campestris was better than that found in A. sieberi and A. annua. This rate has been reported for the first time [1, 2]. It is noted that the efficient ultrasound extraction potential implies extraction of higher amount of co-metabolites so low artemisinin crystal purity is engendered but a combination with a purification step using activated charcoal and celite adsorbents produced crystals with comparable purity for ultrasound samples [3].

Keywords: Ultrasound; Artemisinin; HPLC analysis; Crystallisation.

References

1. Arab, H., et al., Determination of artemisinin in Artemisia sieberi and anticoccidial effects of the plant extract in broiler chickens. Tropical
3. Chemat Smain et al. Exraction mechanism of ultrasound assisted extraction and its effect on higher yielding and purity of artemisinin crystals from Artemisia annua L. leaves. Ultrasonics Sonochemistry.
In vitro and in silico antibacterial tyrosyl-tRNA synthetase activity of the aqueous extract of olive leaves

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ABSTRACT

The emergence of antibiotic-resistant microbes is considered as a serious public health problem that led to increased morbidity and mortality worldwide\cite{1}. However, antimicrobial agents from medicinal plants have given a new alternative against these microorganisms\cite{2}. Nowadays, ethical issues about use of animals for experiments are of great concern necessitating the quest for alternative procedures such as in vitro and in silico methods thereby reducing animal use. The aim of this study is first to test in vitro, the antibacterial activity of the aqueous extract of olive leaves and then to predict, by molecular docking, the compounds responsible for this activity. The extraction is made by decoction of the leaves and the extract is tested by the diffusion method on three ATCC strains \cite{3}. The main compounds found Olive leaves aqueous extract, were docked via Autodock tools 1.5.7 software to inspect the affinity of the selected phyto-constituents to the binding site of the bacterial tyrosyl-tRNA synthetase \cite{4}. S. aureus and E. coli were susceptible to the extract with inhibition diameters of 14 and 13 mm respectively. However, P. aeruginosa was completely resistant. The data showed that the main compound named Oleuropein occupy active pockets of the target enzyme with a score of -4.24 kcal/mol close to that of the standard gentamicin with -4.60 kcal/mol. These results suggest that the mechanism of action of the main compound can be the same that of the standard but not the same for other compounds. Therefore, each constituent must be tested on other bacterial targets to confirm their mode and place of action.

**Keywords:** Olive; Decoction; tyrosyl-tRNA synthetase; Binding energy; Phytocompounds.

References

High Antioxidant Capacities and Anti-inflammatory Effects of *Hammada elegans* Botsch. Extracts: An *in vitro* Assessment

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ABSTRACT

Plants supply traditional Algerian medicines for the treatment of antiinflammatory effect. The reasons for the use of traditional treatment were that pure compound obtained were also effective in reducing the toxicities of toxic agents or other drugs. In this study, we explore the phytochemical composition and the phenolic content by indirect method to evaluate the antioxidants and the anti-inflammatory capacities of twelve extracts from three plants.

The total phenolic content ranged from 0.168 ± 0.020 to 4.166 ± 0.124 mg per gram of dry weight. Phytochemical screening revealed that tannins, C-heterosides, O-reduced heterosides and reducing compounds are the most common chemical groups. The highest antiradical activity was achieved with methanolic extract of *Hammada elegans* (EC50 = 0.551 ± 0.171mg/mL). However, the acetonic extract of *Hammada elegans* represents the most important reducing activity (EC50 = 0.747 ±0.004 mg/mL). Moreover, this extract also displays the highest chelating ferrous ions effect (EC50 = 5.749 ±0.009 mg/mL) while the hydromethanolic extract of *Cleome arabica* has the best antiliperoxidative effect (EC50 = 0.031 ± 0.000 mg/mL). Furthermore, all extracts inhibit the activity of lipooxygenase and cyclooxygenase with IC50 values less than 19.210 ± 0.297 mg/mL. Therefore, the acetonic extract of *Hammada elegans* appears to be twice greater than that of standard inhibitors. The fractionation of the acetonic extract of *Hammada elegans* has given a potent bioactive compound which seems to have potential therapeutic possibilities for the prevention of the inflammatory effects.

Keywords: Anti-inflammatory effect, antioxidant capacity, *Hammada elegans*, isolation, phytochemical screening.

References

Anti-inflammatory potential of water-soluble polysaccharides derived from some spontaneous medicinal plants on activated human neutrophils

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ABSTRACT

The anti-inflammatory activity of polysaccharides extracts derived from the seeds of Plantago notata (PSPn) and Plantago albicans (PSPc) has been studied. The anti-inflammatory potential of the extracts is evaluated by the investigation of their effects on the activity of NADPH oxidase and myeloperoxidase (MPO) of human neutrophils stimulated by phorbol 12-myristate 13-acetate. NADPH oxidase and MPO are two key enzymes in the inflammatory response, their activities generate reactive oxygen species. These produced species are necessary for the degradation of pathogens. The activity of NADPH oxidase is measured by the reduction of ferricytochrome C to ferrocytochrome C, while the activity of MPO is evaluated by peroxidation of 4-aminoantipyrine, a chromophore, to Quinone imine. The results obtained show that the activity of neutrophils NADPH oxidase is significantly inhibited in a concentration-dependent manner by PSPc and PSPn. This inhibition is 49.39% and 63.08% at 100μg/ml for PSPc and PSPn, respectively. Similarly, these two extracts exerted an important inhibitory effect on the activity of neutrophils MPO, with an average of 41.16% at 100μg/ml for the two extracts PSPc and PSPn. In conclusion, the PSPn and the PSPc, prove their anti-inflammatory potential, via their inhibitory capacities on the functioning of NADPH oxidase and the MPO. Indeed, these two plants for phytomedicinal use can be considered as a natural source of bioactive polysaccharides.

Keywords: Polysaccharides; Plantago notata; Plantago albicans; Neutrophil; Anti-inflammatory.

References

Antioxidant activity of aqueous extract of *Ajuga iva* grown in Algerian steppe (Djelfa province)

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ABSTRACT

“Natural antioxidants” have attracted the attention of recent research as natural sources in preventing and scavenging free radicals. The aim of this study was to evaluate antioxidant activity, total phenolic and total flavonoid content of the aqueous extract of *Ajuga iva* (“Chendgoura” commonly named) in Djelfa district (Algerian steppe). Total phenols and flavonoids were carried out by Folin-Ciocalteau reagent method and aluminium chloride method respectively. Antioxidant activity was determined using 1,1-diphenyl-2-picrylhydrazyl (DPPH) method. The total phenolic and flavonoid content of the aqueous extract of the aerial parts of *Ajuga iva* was 17.60±0.56 mg GAE/g (DW) and 28.96±0.64 mg QE/g (DW) respectively. The antioxidant activity of *Ajuga i.* aqueous extract, using DPPH assay, was concentration dependant with IC50 value of 456.23 µg/ml and a percentage of 71% (at 600 µg/ml) less high than the ascorbic acid 82% (at 200 µg/ml). The results show an antioxidant potential for the aqueous extract of the local *Ajuga iva*, which needs to be confirmed by other methods.

Keywords: *Ajuga iva*; Aqueous extract; Antioxidant; DPPH.

References


7. Boukada F, Meddah B, Flavonoids from aerial part of Algerian *Ajuga iva* (L) schreb.: the HPLC-UV analysis and antioxidant capacity Kragujevac J. Sci. 2021, 43; 23-34.

The antioxidant activity of alkaloids extracted from *Peganum harmala* L.


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ABSTRACT

The purpose of this study is to assess the antioxidant activity of alkaloids extracted from *Peganum harmala* L. *Peganum harmala* L. is a species of the Zygophyllaceae family. Because it contains multiple chemicals, it is utilized in traditional medicine. Chemical analysis revealed that *Peganum harmala* L. contains flavonoids, tannins, reductases of sugar, anthocyanins, triterpenes, and sterols, as well as a high concentration of alkaloids. The yield of alkaloids in seeds was calculated to be 2.33%, whereas the yield of alkaloids in the vegetative component was assessed to be 0.78%. TLC, on the other hand, revealed the existence of two types of alkaloids in the alkaloid extract of seeds and the vegetative portion. In terms of antioxidant activity, using DPPH, the alkaloid extract of the seeds demonstrated significant efficacy, with an IC50 of 75.63 µg/mL.

***Keywords***: *Peganum harmala* L – Alkaloids – TLC (Thin layer chromatography)- Antioxidant activity.
Characterization and evaluation of some biological activities of produced secondary metabolites of *Penicillium* specie isolated from industrial waste

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ABSTRACT

One of the most fascinating species of fungi is *Penicillium*. The study of *Penicillium* species has enhanced far beyond their ability to synthesize antibiotics and a significant number of bioactive substances used in the medical community for the treatment of various infections over the years, and they now play a significant role in the biotechnological and biomedical applications. Compounds from terpenes, fatty acids, carboxylic acids, esters and alcohols as other chemical classes were identified using gas chromatography-mass spectrometry (GC-MS) analysis. Using the agar wells diffusion method, an investigation was conducted to assess the inhibitory potential of fungal ethyl acetate extracts against a variety of multi-resistant bacteria and yeast, we isolated a novel strain of *Penicillium* specie from industrial waste, which was cultivated and subsequently extracted the bioactive compounds, variety of human pathogenic microorganisms were tested for *in vitro* antimicrobial activity. The antimicrobial activity results revealed that the most sensitive strains was *Pseudomonas aeruginosa*, *Enterococcus feacalis*, *Staphylococcus aureus*, , *Methicillin resistant staphylococcus aureus* and *Candida albicans* with diameters ranging from 20,13 mm to 33 mm. In the other hand *Salmonella typhimurium* and *Escherichia coli* were the most resistant, with diameters ranging from 7,02 mm to 10 mm. This result deserves additional research to examine potential uses of this fungi extract as active components of drugs in the medical field.

Keywords: natural products, extraction, *Penicillium*, GC/MS, antimicrobial activity.

References

LC-MS analysis of Centaurea papposa extract

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ABSTRACT

This work aimed to ascertain the phenolic compounds of ethyl acetate extract of Centaurea papposa, in order to find new sources of polyphenols. The genus Centaurea L. (Asteraceae, Carduae) is characterized by biosynthesis of flavonoids (Akkal et al., 2003). Phenolic compounds were appraised using LC-MS technique. LC-MS analysis revealed the presence of 21 compounds among which 13 were phenolic acids, 6 flavonoids, 1 phenolic aldehyde and 1 benzo-pyrone.

Keywords: Centaurea L; LC-MS analysis; polyphenols; ethyl acetate extract.

References

Antibacterial activity of *Artemisia herba-alba* and *Artemisia campestris*
against pathogenic bacteria
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**ABSTRACT**

Contamination of foods with foodborne pathogenic bacteria is a worldwide problem that could arise during production or storage of foods. Indeed, these bacteria can be the cause of toxic-infections or food damage, which are a serious health and economic problems. To combat these microorganisms, physical or chemical processes such as heat treatment or preservation with chemical synthetic substances are widely used for food products preservation. However, these processes can cause changes in food organoleptic characteristics, as well they can cause many human health problems. The plants are an inexhaustible source of bioactive molecules that can be used in several fields. Food industry is among the application fields of plants as alternatives to chemicals. The objective of this study is demonstrating the antibacterial activity of two medicinal plant extracts: *Artemisia herba-alba* and *Artemisia campestris* against pathogenic bacteria in order to use them as food bioconservatives. Results have shown that the aqueous and alcoholic plants extracts exhibit an antimicrobial effect with inhibition zones ranging from 0 to 29mm in diameter. The inhibition zone diameters are different according to the extraction solvents and the target strains. Indeed, the alcoholic extract of *A. campestris* gave inhibition zones of: 08, 10, 11, 12, 13, 15, 20, 29 for *Bacillus cereus*, *Bacillus subtilis*, *Staphylococcus aureus*, *Salmonella Enteritidis*, *Escherichia coli* respectively. However, the aqueous extract of this plant was active only against bacillus cereus with an inhibition zone of 13mm in diameter. However, the alcoholic extract of *A. herba-alba*, gave zones of inhibition of: 07, 09, 10, 12 and 14 respectively against the pathogenic strains, while the aqueous extract of this plant exhibited no antibacterial activity against the target strains. These results are very interesting and have potential applications in agri-food field, consequently these plants or their extracts may be used as alternatives to chemical preservatives.

**Keywords:** medicinal plants, antibacterial activity, bioconservation.

**References**

Determination of hydrolytic and insecticidal activities and germination activation of durum wheat seeds (*Triticum durum*) by rhizospheric bacteria (PGPR)

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**ABSTRACT**

Rhizobacteria, known as Plant Growth Promoting Rhizobacteria (PGPR), promote plant growth and protect them against attack by plant pathogens. In this present work, we were interested in characterizing PGPRs, isolated from the rhizosphere of durum wheat (*Triticum durum*). Three bacterial strains of the genus Bacillus were isolated. The evaluation of their extracellular hydrolytic capacity allowed the revelation of enzymes: amylase, esterase, lipase, caseinase, cellulase, coagulase as well as their ability to solubilize tricalcium phosphate. They are resistant to oxacillin and penicillin, but sensitive to Gentamicin, Tetracycline, Ampicillin and Cefoxitin. The results of the inoculation of durum wheat seeds with the bacterial suspension of the three isolates (*Bacillus* sp. 1, *Bacillus* sp. 2 and *Bacillus* sp. 3) in comparison with the non-inoculated controls showed an effect on the growth of the root and stem length in durum wheat seeds. Only the Bacillus sp.1 isolate was tested against *Cydia nigricana* lepidopteran larvae. The results showed an insecticidal effect after 72 hours of treatment with a dose of 60\textmu L. The results obtained suggest that the isolates tested have an insecticidal effect on certain lepidopteran larvae and a stimulatory effect on seed germination.

**Keywords**: PGPR; germination; wheat; enzyme activity; insecticide

**References**


Study of the antioxidant, anticoagulant, antifungal and antibacterial activity of Ocimum Basilicum L.

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ABSTRACT

A large number of aromatic and medicinal plants have very important biological properties that find many applications in various fields; among these plants we have chosen Ocimum basilicum L. Due to its therapeutic properties. The antioxidant, antifungal, and anticoagulant activity of the aerial part of Ocimum Basilicum L. cultivated in the region of Mila (Chalgoum el Aid) has been considered. We first proceeded to the extraction of secondary metabolites by aqueous and hydromethanolic maceration and the liquid-liquid fraction by using solvents of increasing polarity which are: Petroleum ether, Chloroform, Ethyl Acetate and n-Butanol. Chromatography studies showed the presence of several secondary metabolites compounds. Evaluation of the antioxidant activity of O basilicum extracts, L by the DPPH test and electrochemically reveals that the plant has an important antioxidant power with different extracts. But only the extract chloroform of our plant shows a good antifungal activity. The anticoagulant activity was evaluated by the cephalin-kaolin time (TCK) and Quick time (TQ) tests, demonstrating that both extracts exert significant anticoagulant activity vis-à-vis both coagulation pathways. Finally, the results obtained show that the bacterial species studied have different degrees of sensitivity to the fractions tested. It is noted that the bacterial strains E. coli and B. cereus are present as the most sensitive to O. basilicum fractions at any dose. While the bacterial strains S. aureus and P. aeruginosa are sensitive to fractions (chloroform and ethyl acetate).

Keywords: Ocimum basilicum L., antioxidant, anticoagulant, antifungal and antibacterial activity

References


Characterization Quantification and Qualitative of the Phenolic compounds and antioxidant activity of *Helianthemum Lippi L*

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ABSTRACT

Medicinal plants have long played important roles in the treatment of diseases all over the world. Among the medicinal plants which locally known is (Samhari) .that is playing a vital role due to its various medicinal properties .Bioactive compounds were extracted by using standard protocols. Antioxidant activity was done by DPPH and FRAP assay. Anti-inflammatory activity was studied by membrane stabilization assay. Results of Phytochemical essays showed that aqueous extract of *Helianthemum Lippi L* is very rich on different chemical compounds such as flavonoids, Phenols, tannins, Saponide, steroids and terpene. Total phenolic and flavonoids contents of *H. Lippi L*.obtained from water solvent were 254.3± 3,27 mg GAE/g and 85.30± 0,05 mg of QE/g respectively. IC50 values in the DDPH radical scavenging activity assay and FRAP indicate that this plant have a high antioxidant activity. Infra red (IR) analysis of *Helianthemum Lippi L*. revealed the existence of different peaks that are characteristic of this plant. The results of variability membrane stabilization according to deferent concentrations of aqueous extract of *H. Lippi L* which have a high anti-inflammatory effect. The results conclude that, *Helianthemum Lippi L* rich of bioactive compounds which protects against oxidative stress and inflammatory disease.

Keywords: Phytochemical essays; Antioxidant; DDPH; FRAP; bioactive compounds.

References

The in vitro antioxidant potential and phytochemical content of aqueous extract of local fenugreek seeds, *Trigonella foenum-graecum L*

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ABSTRACT

Antioxidant activity of medicinal plants is regarded as one attributable factor for their therapeutic potential. Hence this study was carried out to evaluate the antioxidant capacity of local fenugreek seeds using various antioxidant tests, including total antioxidant, free radical scavenging, and reducing power, using ascorbic acid as standard. Quantitative analysis of secondary metabolites was determined as well using colorimetric assays. The phytochemical analysis of fenugreek seeds revealed the presence of several phenolic compounds including polyphenols (196±0.89 µg AGE/g E), flavonoids (104±0.21 µg QE/g E), tannins (881.4±4.75 µg CE/g E), flavones (37±0.05 µg RE/g E) and ortho-diphenols (26.17 ±2.44 µg CAE/g E). Aqueous extract of the seeds exhibited effective reducing power capacity (FRAP =176.98±6.95 µg/ml), free radical scavenging potential (DPPH=133.89±9.04 µg/ml) and total antioxidant activity (CAT= 110.29±9.76 µg/ml). The results obtained in the present study suggested that fenugreek seed is a potential source of natural bioactive phenolic compounds with high antioxidant properties which emphasize its application biotechnologically as antioxidant agents or for treatments in diseases.

Keywords: Antioxidant activity, *Trigonella foenum-graecum L*, Phenolic content, DPPH, FRAP
HPLC analysis and antioxidant activity of methanolic extract of Cistanche tinctoria (Desf.) Beck. (Orobanchaceae)
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ABSTRACT

For valorizing spontaneous medicinal plants growing in the northeast of the Algerian Sahara, we conducted a phytochemical study and estimated the antioxidant capacity of Cistanche tinctoria (Desf.) Beck. This parasitic plant belongs to the Orobanchaceae family, and is widely distributed in hypersaline, semiarid, and arid areas worldwide; It is also distinguished by its wide range of therapeutic uses. The extraction was carried out by cold maceration using methanol. The results showed that the total phenol was estimated to be (150.11 ± 5.12 mg AGE/g Extract) and the total flavonoid content was (18.369 ± 2.3 mg QE /g extract). The evaluation of antioxidant power using the Ferrous Reducing Power method, the DPPPH• assay, and anti-hemolysis activity Concerning the qualitative analysis of phenolic compounds for both extracts using high-performance liquid chromatography (HPLC) has been demonstrated that the presence of Chlorogenic acid, Caffeic acid, and Naringin in an extract with different concentrations.

Keywords: Cistanche tinctoria; Orobanchaceae; phytochemical analysis; antioxidant activity; HPLC.

References

Synthesis, Characterization and Antioxidant Activity of Functionalized Graphene Oxide Nanoparticles with 4-(ferrocenylmethylamino) Benzonitrile

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ABSTRACT

In this work, graphene oxide (GO) nanoparticles was prepared and functionalized by 4-(ferrocenylmethylamino) benzonitrile via (3-Aminopropyl)triethoxysilane (APTES) as linker (GO@APTES@FcB4CN). The graphene oxide nanoparticles were synthesized by modified hummer's method[1], and were analyzed with X-ray Diffraction (XRD), Fourier Transform Infrared Spectroscopy (FTIR).

In vitro the antioxidant activity of the studied nanocomposite was evaluated using 1, 1-diphenyl-2-picrylhydrazyl (DPPH) and 2, 2’-Azinobis 3-Ethyl-benzothiazoline-6-Sulphonate (ABTS) assay[2, 3]. This methods is based on the spectrophotometric measurement of ABTS cation radical (ABTS•+) and DPPH• radical concentrations changes resulting from the ABTS•+ and DPPH• reaction with nanocomposite and using butylated hydroxytoluene (BHT) and ascorbic acid (ASA) as standard antioxidants. In both methods, the results indicated that nanocomposite exhibited efficient inhibitory activity against ABTS cation radical and DPPH• radical, which was comparable to the standard BHT and ASA.

Keywords: Graphene Oxide, GO@APTES@FcB4CN, functionalization, Antioxidant activity, ABTS, DPPH.

References

The First International Seminar on Catalysis, Chemical Engineering & Green Chemistry

Chemical composition and characterization of some Tunisia plant oils and investigation of their antioxidant and antibacterial activities

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ABSTRACT

This study joins in a frame of the valuation of healing plants by the use of their oil in the pharmacology. The interest for these plants is motivated by their use in the traditional pharmacopoeia for their antioxidant and antibacterial properties. The objective of this work was to study the stability of oil of these plants, to determine their chemical compositions and to estimate their antioxidant and antibacterial activity. A study of stability contained the evaluation of the indications of peroxide, saponification and iodine. The evaluation of the antioxidant activity was made through the test DPPH and that of the reducing power. The study of the antibacterial activity was based on the determination of the inhibitive minimal concentration and the realization of the test of Halo. A chromatographic analysis in gas phase was made for 11 samples only among 23 healing plants, object of our study. The analysis of fixed oil by means of the indication of peroxide, the indication of iodine and the indication of saponification showed a stability of the plant supports. Various oil of the studied plants showed an antioxidant power and an antibacterial power on certain bacteria Gram positive and negative Gram which are variable from a sample to another one. Oil of the garlic, the incense, the henna, the onion and the lemon appears to have antioxidant and antibacterial activities more important than the rest of the used products. Qualitatively, the chromatographic analysis of 11 studied oil highlighted profiles comparable to those noticed in the literature for certain healing plants. They contained especially the polyunsaturated fatty acids, the flavonoids, unsaturated fatty acids. Vegetable oil of our study seems to have antioxidant and antibacterial properties which can be exploited in human therapeutics in particular in the treatment of certain cutaneous wounds.

Keywords: Antioxidant; chromatography; antibacterial activity; stability

References
The First International Seminar on Catalysis, Chemical Engineering & Green Chemistry

Chemical study of crude turnip extracts (Brassica rapa subsp. rapa) grown in the region of El-Oued.

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ABSTRACT

This work aims to study the chemical properties of plant extracts obtained by soaking turnip plants in 100% water and 100% methanol. The study, through phytochemical analysis, provides an insight into the active substances and an estimation of aqueous and methanolic extracts yields. This paper also studies the antibacterial and antioxidant properties of the extracts. The phytochemical analysis revealed that the plant is rich in active substances as proved by the presence of phenols, flavonoids, terpenes, saponins, alkaloids, carbohydrates, tannins, and the absence of anthocyanins and starch. The yield of the aqueous extract was estimated at 49.6% and the methanolic one at 22.8%. Our study shows that the antibacterial activity of the turnip plant extracts does not have sufficient efficacy to inhibit the tested bacterial strains. As for the antioxidant properties, the methanolic extracts show an inhibiting activity towards DPPH radical in which (IC50 = 0.81) was superior to the aqueous extracts with (IC50 = 1.50). The aqueous extracts show a significant ability to inhibit CAT oxidation with a value of (90.03 mg EAA / g) higher than the methanolic extracts whose inhibition rate is estimated to inhibit CAT oxidation at a value of (10.98 mg EAA / g).

Keywords: secondary metabolism, Brassicales, turnip, bacteria, CAT, DPPH, Brassica rapa subsp rapa.

154
Synthesis and spectroscopic study of benzodiazepinones

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ABSTRACT

4-Hydroxy coumarin 1 is a benzolactone of major interest in therapeutic chemistry[1]. Constituting the starting product in the synthesis of several biologically active compounds [2,3], this product intervenes in the formation of multiple compounds such as the antivitamin K and the antibiotic Novobiocin by various synthetic routes.

In this work, we carried out the synthesis of benzodiazepinones 2 by condensation reaction of hydroxycoumarin on orthophenylenediamine differently substituted under operating conditions not described in the literature.

References:


Green Synthesis: An Eco-friendly Route for the Synthesis of Copper Oxide Nanoparticles

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ABSTRACT

Copper oxide nanoparticles (CuO NPs) can be synthesized using green synthesize method. Green syntheses provide low cost, high yield production, and easy processing steps. This review focuses on the synthesis of CuO nanoparticles using various plant extracts, such as leaves, flowers, peels, and roots. The CuO nanoparticles were characterized using a variety of techniques, including X-ray diffraction (XRD), Fourier transforms infrared spectroscopy (FTIR), scanning electron microscopy (SEM), and ultraviolet-visible spectroscopy (UV-Vis). The majority of the results of various studies have proven that the green synthesis of CuO is spherical shape, with an average size ranging between 2 and 50 nm.

Keywords: Green synthesis; CuO NPs; Plant extracts; Copper Oxide.

References

Biosynthesis, Characterization, And Evaluation Of The Biological Activities Of Nanoparticles Synthesized From Plant Extract

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ABSTRACT

The novel and sustainable methodologies under 'Green nanotechnology' have been recently developed for nanoparticle synthesis. Chemical, physical and biological (natural precursors) have been analytically studied for the design and synthesis of nanoparticles with the desired size, shape and functionalities. The green perspective includes solvents, reductants or stabilizing agents obtained from a natural resource as they are non-toxic and eco-friendly. [1], [2], [3], [4].

In this study, a sustainable green synthetic strategy to synthesize zinc oxide nanoparticles by employing medicinal plants. Mation of zinc oxide nanoparticles was confirmed by comprehensive characterization techniques. The presence of biomolecules and metal oxides were confirmed by UV-Vis and Fourier transform Infrared (FT-IR) spectral data analysis. The X-ray diffraction (XRD) revealed the formation of pure wurtzite ZnO crystalline nanoparticles. The antibacterial activity was tested using the disk diffusion method.

Keywords: Zinc Oxide Nanoparticles, Medicinal Plants, Green Synthetic, Antibacterial Activity

References

**In vivo** antimicrobial effect of methanolic extract of *Apium Graveolans*
Seeds From Western Algerian Region

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**ABSTRACT**

Worldwide, the very high prevalence of microbial intestinal infections and antibiotic resistance have become the major public health problem¹. Much research has been devoted to finding a natural remedy². Among these plants, *Apium graveolans*, Known as Celery³, comes from western Algeria and is very widespread in herbal medicine thanks to its therapeutic virtues⁴.

The objective of this study is to evaluate the antimicrobial effect of seeds of this plant *in vivo*.

To carry out this work, 18 wistar rats were divided into three groups (-Witness Group- Control Group- Treated Group with seeds extract of *A.graveolans*). After induction of the infection by injection of a bacterial suspension at 10⁸ CFU/ml, the antimicrobial potency of the extract was then evaluated by observation and counting of the colonies in blood cultures carried out regularly during the experiment. In addition, histopathological study of the ileum was performed to confirm the blood culture results.

The results of the blood cultures of the experimental groups revealed that the methanolic extract of *Apium graveolans* seeds possesses an antimicrobial power. These results are confirmed by the histological study which showed in the treated group a healthy tissue with a preserved architecture.

Our results show that the seed of the medicinal plant *Apium graveolans* has an antimicrobial power; it can be used to fight against microbial intestinal infections.

**Keywords:** Microbial intestinal infections- *in vivo*- *Apium graveolans*- Antimicrobial power- Rat.

**References**

1. OMS. L’Alliance quadripartite inaugure sa Plateforme de partenariat multipartite sur la résistance aux antimicrobiens pour aider à neutraliser cette menace globale qui pèse sur la santé humaine et animale et les écosystèmes; OMS: Suisse, 2022.


Antioxidant and anti-mastitis activity of some essential oils

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ABSTRACT

The present study deals with the evaluation of the antioxidant activity and the antimicrobial activity of 12 essential oils of local aromatic plants which are traditionally used in Algeria against 9 microbial strains responsible for dairy animal breast infections in order to select the most interesting oils. Physicochemical properties such as Refractive index and density are determined to assess the quality of the studied oils. Density of Eugenol and clove oil are greater than 1 (1.06 and 1.0019 respectively). Clove oil density is reported to be higher than the density of water. Antioxidant activity of the extracts was evaluated by three methods: reducing power by TPTZ method, DPPH and ABTS free radical scavenging. Thymol and eugenol displayed remarkable free radical scavenging properties. The antimicrobial activity of the tested oils was evaluated by biofilm formation inhibition using crystal violet assay. The crystal violet test revealed that the 5 oils mentioned above have a strong inhibitory activity towards the preliminary formation of biofilm, clove proved to be the most active towards the primary formation of biofilm and its removal once formed. The essential oils of thymus vulgaricus, origanum vulgare, syzygium aromaticicum, as well as eugenol and thymol showed significant antioxidant activity compared to other oils tested. Clove oil (syzygium aromaticicum) showed the best antibiofilm activity, especially that formed by Staphylococcus aureus.

Keywords: Animal mastitis, Antioxidant activity, Antimicrobial activity, Essential oils, Medicinal plants.

References

Review on biological activities and bioactives compounds of *Artemisia compestris*

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ABSTRACT

Diverse medicinal plants such as those from the genus Artemisia have been employed globally for centuries by individuals belonging to different cultures. Universally, *Artemisia* species have been used to remedy various maladies. The phytochemical screening of this species revealed the presence of tannins, polyphenols, flavonoids, saponosides, essential oil and minerals. The essential oil of *A. campestris* has been isolated and investigated for its chemical composition and biological activities by several authors in Algeria and other countries. It has been demonstrated that the presence of different chemotypes of essential oil exhibited antioxidant, antibacterial, antifungal, insecticidal and antiviral activities. Different compounds have been isolated from the solvent (chloroform, hexane, and alcohol) extracts of this species such as flavonoids, chromones, and acetophenones that are the origin of different biological activities of this species such as antioxidant, antibacterial, hepatoprotective and antivenin activities. An in-depth investigation into the literature reveals that divergent species of Artemisia exhibit a vast array of biological activities such as antimalarial, antitumor, and anti-inflammatory activities. There is substantial potential for bioactive compounds from Artemisia to provide significant relief from differing human ailments, but more meticulous research in this field is needed. A bibliographic research of this plant has been carried out by means of scientific databases like Google Scholar, PubMed and Science direct; as a result, it has been found that this herb possesses a rich phytochemical content and a wide range of pharmacological activities such as antioxidant, insecticidal, antibacterial, antimutagenic, antivenom and antitumor effects. In an aim to highlight the importance of *A. campestris* L., this review has been established by discussing its morphological, ecological, phytochemical and pharmacological studies.

Keywords: *Artemisia compestris* ; maladies; biological activities; bioactives compounds
The First International Seminar on Catalysis, Chemical Engineering & Green Chemistry

Development of new biocomposite materials impregnated with plant extract to inhibit the growth of pathogens

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ABSTRACT

Infections with various micro-organisms are a real problem for human health in modern society. They affect different sectors such as medical equipment, water purification systems, packaging, food storage and many other areas from the societal to the domestic and individual level.

The aim of this work is to develop new biocomposite, biodegradable and antimicrobial materials, capable of reducing or destroying the growth of pathogens in the agri-food sector in particular the storage and packaging of food products and the parapharmacy sector by the manufacture of antimicrobial soles. We have elaborated this material by using a biodegradable biopolymer which is the sodium alginate and the extract of Algerian medicinal plant called Innula Viscosa. The FTIR and DSC caracterizations confirm a good incorporation of the extract in the biocomposite. The powerful antimicrobial of the material was evaluated by disk diffusion method. The results show a bacterial effect against Gram positive and negative bacteria. The antimicrobial biocomposite elaborated can be microscopic or macroscopic according to their uses.

Keywords: biocomposite; biodegradable; antimicrobial; Algerian medicinal plants; sodium alginate.

References

In vitro Antimicrobial Synergy Of PLGA /Silver Nanocomposites Prepared By Green Chemistry

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ABSTRACT

A green synthesis of silver nanoparticles (Ag-NPs) was carried out by utilizing a biomimetic approach. Herein, Nigella Sativa extract was employed as the precursor excipients, which played a synergistic role in the reduction and capping (stabilization) of Ag+ into zero valent (Ag 0) Ag-NPs. In addition, the research was directed towards the encapsulation of Ag-NPs within biodegradable polymer matrix poly-D,L-lactic-co-glycolic acid (PLGA). The PLGA/Ag nanocomposite (PLGA-Ag NCs) were characterized using varied state of microscopic and spectroscopic techniques (UV-VIS, SEM, FTIR and DRX analyses). Disc diffusion and time-kill assay were performed on bacterial strains viz. Escherichia coli, Pseudomonas aeruginosa, Salmonella typhimurium, Staphylococcus aureus and Klebsiella pneumoniae for evaluating the antibacterial activity of Ag-NPs and PLGA-Ag NCs which showed a remarkable response. Both the antibacterial assays highlighted the superiority of PLGA-Ag NCs in inciting an escalated bactericidal effect in comparison to Ag-NPs, respectively. Hence, the present research article thus reports a novel biocompatible approach to tackle the overgrowing problem of antibiotic resistance.

Keywords: Nanocomposites, Biomimetic approach, PLGA, Silver nanoparticles, Antibacterial activity

References

5. Kaining Z, Babatunde R, Anantha N. PLGA Nanoparticle-Based Formulations to Cross the Blood–Brain Barrier for Drug Delivery: From R&D to cGMP. Pharmaceutics (2021), 13, 500
Chemical Composition and Antibacterial activity of Essential Oil of

*Marrubium vulgare* from Eastern Algeria

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**ABSTRACT**

The essential oil from flowering *Marrubium* (*Marrubium vulgare* L.) an aromatic member of the Lamiaceae family, from Algeria, obtained by hydrodistillation, was analysed by GC/FID and GC/MS. The constituents were identified by their mass spectra and Kovats’ indices. Fifty (50) components in the oil of *M. vulgare* were identified. The results demonstrated that the major components of the essential oil were: 4,8,12,16-Tetramethyl heptadecan-4-olid (16.97%), Germacrene D-4-ol (9.61%), α-pinène (9.37%), Phytol (4.87%), Dehydro-sabina ketone (4.12%), Piperitone (3.27%), δ-Cadinene (3.13%), 1-Octen-3-ol (2.35%) and Benzaldehyde (2.31%). Essential oil of *M. vulgare* was evaluated for its antibacterial activities against Gram-positive and Gram-negative pathogenic bacteria: *Bacillus subtilis*, *Micrococcus luteus*, *Escherichia coli* and *Klebsiella pneumoniae*.

**Keywords:** Marrubium vulgare; Essential oil composition; GC/MS; antibacterial activities.

**References**


The present study was conducted on 16 males of Albino rabbits which were divided into four groups (a control group, a group envenomated by Cerastes cerastes venom, an envenomated group treated with venom and flavonoids extracted from medicinal plant Matricaria pubescens, and the last envenomated group treated with the anti-venom serum). Metabolic and histopathological changes were examined in different treated groups. The histological sections from tissues of different organs (liver, kidneys, lungs, muscles, heart, and brain) allowed us to observe a normal structure in all the organs of untreated rabbits unlike the treated ones. Our results showed a very highly significant increase in the concentrations of glycemia, urea, and creatinine in treated rabbits compared to the control. Statistical analysis showed that there was a very highly significant (p = 0.0000) between all the groups in the increase of glucose, urea concentration, TGO and TGP and a highly significant in the creatinine (p = 0.0002) and the PTT (p = 0.0015). On the other hand, a very highly significant decrease in the total cholesterol, triglyceride, fibrinogen, and Prothrombin time of treated rabbits compared to those of the control. Statistical data confirmed that there was a very highly significant (p = 0.0000) between all the groups. According to the PCA analysis, the biological parameters (cholesterol, triglyceride, fibrinogen, and prothrombin time) were very close, a certain similarity was reflected between them which means that these parameters were influenced by each other. Same thing for the glycemia, urea, creatinine, GOT, GPT, and PTT.

Keywords: Matricaria pubescens; Cerastes cerastes; antivenom; metabolism; histopathology.

References

Study of the chemical and biological activity of the aerial part *Cyperus Fuscus* L sedge plant

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**ABSTRACT**

In order to assess part of the vegetation cover in the valley area, we studied the biological and chemical activity of the aerial part of the brown plant Saad, *Cyperus fuscus* L. The study included chemical detection of the presence of saponins, flavonoids, unsaturated sterols and terpenes and the absence of alkaloids.

The quantification of polyphenols was also performed for the ethanol-water extract, where the highest value was 67.49 mg/g, while for the flavonoids, the highest value for ethanol-water extract was 31.55 mg/g at a concentration of 0.5 mg/ml.

And through the results of the estimation of the antioxidant activity of µg/mL, while for the ascorbic acid mixture, it was estimated at 63.87 µg/mL.

The ethanol-water extract of the aerial part of the plant using the DPPH test, the results showed that the IC50 value of the ethanol-water extract was 120.20 And in the Iron FRAP test, where the optical absorbance value of the extract ethanol-water (8/2) was estimated at 0.64 and the FRAP value was estimated at 52.36 µg/ml.

**Keywords:** cyperus fuscus.L .Anti oxidant. Extraction. quantification of polyphenols and flavonoids

**References**

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The essential oil of *Origanum majorana* *L.* was extracted from El Oued, and its chemical composition, olfactory evaluation, and antioxidant effects were studied

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ABSTRACT

Using the use of GC/FID and GC/MS, the chemical make-up of marjoram essential oil, which comes from the *Origanum majorana* *L.* plant, was analyzed. Terpinen-4-ol made up 18.51 % of the oil, whereas trans-sabinene hydrate made up 13.72 %, γ-terpinene made up 12.71 %, and beta-terpinene made up 6.45 %. The aroma profile of marjoram essential oil has been analyzed, and its quality has been determined. When tested with DPPH, the antiradical activity of marjoram oil was shown to be higher than that of the phenolic component thymol. The oil exhibited a scavenging effect on the hydroxyl radicals (OH•), as well, which substantially exceeded that towards the DPPH radical – the respective concentrations for 50% inhibition of the radicals (IC50) were 0.24µg/mL for OH• and 289.23µg/mL for DPPH. In other words, the oil was significantly more effective at scavenging the hydroxyl radicals than it was the DPPH radical.

In a linoleic acid emulsion model system, marjoram essential oil demonstrated the ability to exhibit antioxidant activity. At a concentration of 0.08%, it was able to inhibit the formation of conjugated dienes by 50% and the generation of linoleic acid secondary oxidized products by 67.44%. Both of these results were seen when the oil was tested.

Keywords: essential oil; antioxidant; Origanum majorana *L*; DPPH; GC/MS.

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</table>
Author Index

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Abdelmonem Miloudi, 105
Abdelrani Messalhi, 68
Abdelsadok Imane, 158
Abderrahmane Berchi, 49
Abderrahmane Sihem, 31
Abir Fouhna, 149
Abtouche Soraya, 101
Adaika Chaima, 16, 22
Ahmed Bayoudh, 128
Ahmed Gargouri, 128
Ahmed Laloui Hamza, 138
Akhram Hamza, 84
Akroum-Amrouche Dahlia, 81, 155
Alia. Khaoula, 64, 73
Amar Djamou, 29, 39
Amel Bendjedou, 104
Ammar Zobeidi, 59
Anis Chikhoun, 130
Aoudj Salaheddine, 93
Aoun Leila, 124
Arbia Yassamina, 101
Asma Elaguel, 128
Atia Djamal, 59, 73
Atia Salem, 77
Badaoui Kawther, 22
Bahadi Rania, 12, 106
Bambra Moussa Abderrazak, 126
Bassa Nora, 50
Bayou Samir, 13
Bedjou Fatiha, 116, 121
Belgherbi Ouaifa, 45, 71
Belhadj Fatima, 14
Belhali Billed, 12
Ben Amor Asma, 80
Ben Amor Ilham, 78
Ben Amor Mohammed Larbi, 166
Ben Cheikh Chaimma, 156
Ben Mansour Riadh, 127
Ben Seghir Bachir, 65, 80
Benabdellaziz Imane, 117
Benaissa Asma, 47
Benamrouche Ouissem, 88
Benaouda Mohamed Amine, 9
Benaoune Saliha, 75
Benazzouz Kinza, 147
Bendia Sabrina, 8
Benine Aida, 27
Benmosbah Mongi, 103
Benosmane Ali, 9
Benrejdal Fazia, 87
Bensafiddine Feriha, 140
Bensatal Ahmed, 57, 122
Bentarzi Yamina, 23
Benzaid Chahrazed, 12
Berredjem Malika, 12, 106
Berredjem Malika, 18
Besserni Rabia, 97
Bettitiou Fatima Zohra, 90
Bochra Gargouri, 30, 128
Bokhallout Fetheddine, 13
Boual Zakaria, 141
Bouaoune Ahmed, 83
Bouatrous Yamina, 126
Bouaziz Mohamed, 127
Bouchagra Samah, 107
Bouchareb Fouzia, 18
Bouhelaghem Ouahiba, 93
Bouchenka Lamia, 2
Boucherit Nabila, 56, 69
Bouchoul Boussah, 71
Boudjemaa Amir Lehtihet, 110
Bougheloum Chafika, 53
Bouguesa Ichra, 3, 16
Boukhallout Fatheddine, 16
Boulfares Islam, 11
Boulal Ahmed, 120
Bouras Hadj Daoud, 92
Bouremmad Farida, 2
Bousba Nesrine, 116
Boussaha Bouchouil, 45
Boussaker Meriem, 12, 24, 106
Boutra Belghassim, 49
Brahim Imene, 125
Brahimi Abdellkarim, 56, 69
Brahimi Meziane, 101
Brahmia Ouarda, 6, 36, 70
Chemmam Dounya Achwak, 144
Chemsa Ahmed Elkhalaifa, 42, 151
Cherfi Inasse, 160
Cheribet Mawahib, 145
Cherrada Nezar, 42, 151
Chetehouna Sara, 10
Chouchane Sabiha, 95
Chouder Dalila, 71
Chouikh Atef, 151
Choukchou-Braham Noureddine, 14
Dahmane Mohamed, 101
Dalichaaouche Nabila, 124
Dalila Hammoutene, 33
Debbche Hanane, 154
Dehamchia Mohamed, 3, 13, 16
Demchi Farouk, 112
Dekir Ali, 18, 106, 108
Derki Maroua, 157
Derki Nour Elhouda, 111
Derki Nour-Elhouda, 100
Derouiche Samir, 10, 11
Djaber Sabah, 96
Djafaroun Rouaissia, 36, 70
Djahra Ali Bouttelalis, 40
Djamila Abdi, 49
Djamila Djemou, 41
Djarallah Marwa, 26
Djebbari Radja, 129
Djelloul Soumia, 135
Djemou Amar, 5
Djemou Djamila, 5
Djouadi-Belkada Fadila, 93
Drouiche Nadjib, 93
Elkolli Meriem, 139
Gabouze Noureddine, 47
Gargouri Bochara, 127
Gheraissa Noura, 42, 151
Gherbia A, 63
Ghodbane Racha, 15
Ghorbal Imene, 126
Guerciache Aouak, 124
Hachouf Maram, 150
Hacine Gherbi Ahlam, 85
Haddad Habiba, 89
Hadji Kenza, 116
Hadri Doumizad, 124
Hadri Kamel, 120
Hafiane Hassiba, 141
Haiouni Kheira, 5
Hamida Khadidja, 75
Hamoud Leila, 60
Hamitouche Houria, 47
Hammiche Hayet, 121
Hamrani Ouiza, 21
Haya Soumiya, 36
Hayahem Sakina, 109
Hechini Mouna, 93
Hemmami Hadia, 65, 72, 78, 80
Henda Daoudi, 162
Iazzourene Ghania, 60
Ichrak Ben Amor, 128
Ikermoud Dalila, 38
Ikram Ikram Hadj Said, 33
Issaadi Rachid, 47
Izza Hidayat, 17
Kaci Nabila, 56
Kadri Mounira, 143
Kahina Belbachir, 146
Kalleh Imen, 128
Kamarchou Abasse, 59
Kazane Imen, 55
Kebaili Asmaa, 14
Kerassa Aicha, 100
Khalil Guellifet, 20
Khammar Rachida, 104
Khaouta Alia, 67
Khaoumi Nadir, 124
Kheffache Ouzna, 79, 86
Kheir Nawal, 13
Kheirredine Bani, 62
Kherief Yahia, 35
Kherkhache Hayat, 118
Kherraz Khaled, 44
Khier Nawal, 155
Khiouani Adel, 58
Kibou Zahira, 14
Kir Imen, 74
Kitous Ouiza, 93
Lachibi Farid, 91
Laib Ibtissam, 40
Lamiri Leila, 45, 71
Lamouri Rahima, 56
Lanez Elhafnaoui, 4
Laouini Salah Eddine, 78
Lassoued Saloua, 127
Lekbir Adel, 131
Louaf Fadila, 6
Louas Ibtisselem, 79
Maalem Badreddine, 61
Mahcine Salem, 141
Mahdi Roufaida, 17
Mahmod A. Abdulqader, 64
Makhloifi Sofiane, 35
Malki Abderrahim, 69
Mameri Nabil, 93
Mammadi Nardjess, 152
Mansouri Achraf, 18
Mansouri Narimene, 124
Meddah Boumediene, 158
Mehellou Ahmed, 76
Menasra Hayet, 75, 94
Mennana Imene, 22
Merzouk Hafida, 159
Merzouki Soraya, 148
Mesbah Mohammed Adel, 123
Messaoudi Hassiba, 19, 79
Messaoudi Mohammed, 46
Moalla Rekik Dorsaf, 153
Mohammed Fouad Farhat, 105
Mokhtar Benmohamed, 48
Mouane Aicha, 164
Mounir Nacer, 34
Nacer Chaabia, 49
Neghmouche Nacer Salah, 6, 59, 98, 136, 166
Noui Yassine, 131, 133
Nouioua Wafa, 119
Omari Mahmoud, 35
Ouanezar Abdelkader, 56
Ouazene Naima, 121
Ouided Abdelaziz, 50
Ounis Amina, 94
Rachid Belkada, 33
Rahal Foudil, 49
Rahma Tibigui, 33
Rahmani Salah-Eddine, 142
Rebhi Fayçal, 69
Rebiai Abdelkrim, 149
Redjemia Rayenne, 12, 106
Regainia Zine, 3
Reggami Yassine, 10
Reghioua Abdallah, 64
Rehali Hanane, 75
Rekik Mohamed Ali, 113
Rouahna Noureddine, 54
Rouhia Zohra, 7
Saada Zahra, 25
Said Khemais, 82
Saidani Karima, 121
Sawicka Barbara, 134
Segueni Khaoula, 37
Sehout Imene, 22
Seid Lamria, 71
Senigra Moussa, 165
Senoussi Mohamed Mourad, 50
Serouti Abdelghani, 105
Slyemi Samira, 79
Souyei Belgacem, 102
Tahar Abbaz, 104
Tamma Noureddine, 115, 149
Tei Siham, 43
Terea Hafidha, 66
Touati Naima, 121
Tounsi Assia, 45
Tounsi Hanane, 52
Wassila Yazid, 49
Youbi Asma, 32
Youmbai Rabia, 13
Yousfi Fatima Zohra, 161
Zaaboubi Siham, 132
Zeghoud Laid, 65
Zeghoud Soumeia, 78
Zellagui Amar, 50
Zemour Kamel, 137
Zobeidi Ammar, 73, 77