

ISSUE CONTENTS LIST WITH GRAPHICAL ABSTRACTS

RESEARCH PAPER

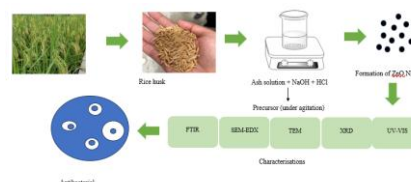
ECOLOGICAL CHEMISTRY

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THE POTENTIAL OF RICE HUSK WASTE TO SYNTHESISE ZINC OXIDE NANOPARTICLES AND ASSESSMENT TO THE ANTIBACTERIAL ACTIVITIES

Nurfitriah Amran, Siti NurSyazwani Maadon, Yamin Yasin, Nik Rozlin Nik Masdek, Mohd Rafii Yusop, Nor Hazlina Mat Sa'at, Nor Monica Ahmad, Nor' Aishah Hasan

The present work explored the synthesis of ZnO nanoparticles using rice husk waste. The characterisation by UV-Vis spectroscopy suggested the formation of ZnO. Analysis of X-Ray diffraction analysis (XRD) confirms the purity of the NPs with a crystallite size of less than 21 nm. Fourier transform infrared spectroscopy reveals the significance functional group at 487 cm^{-1} .



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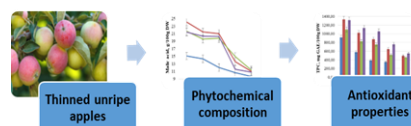
FOOD CHEMISTRY

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PHYTOCHEMICAL COMPOSITION AND ANTIOXIDANT PROPERTIES OF UNRIPE APPLES

Diana Crucirescu

Apples of the *Coredana*, *Golden Rezistent*, *Reglindis* and *Rewena* varieties were studied. The quantitative and qualitative determination of organic acids and carbohydrates were using HPLC and CE methods. Determination of AA and TPC content was evaluated by spectrophotometric methods. The highest amount of organic acids was obtained in the 45th DAFB of harvest, the predominant being malic acid (15.09–21.64 g/100gDW). Sugars had the highest value in 97th DAFB, fructose being the main one (67.79–75.73 g/L). TPC and AA showed maximum values at the beginning of fruit harvesting, having 916.67–1316.13 mgGAE/100gDW and 16.94–23.51 mgAAE/100gDW, respectively. Unripe apples represent a natural source of organic acids and carbohydrates, significant amounts of polyphenolic compounds with antioxidant properties.



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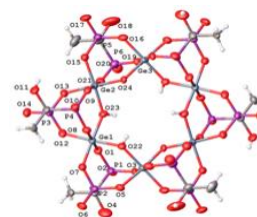
INORGANIC AND COORDINATION CHEMISTRY

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SYNTHESIS AND STRUCTURE OF HETEROMETALLIC MULTILIGAND Ge(IV) - 3d-METALS COMPLEXES WITH 1-HYDROXYETHANE-1,1-DIPHOSPHONIC ACID AND 1,10-PHENANTHROLINE

Kyrylo Tsymbaliuk, Olena Martynko, Viktoriya Dyakonenko, Olena Finik, Inna Seifullina, Svitlana Shishkina

The present study describes synthesis, research and definition of the structure of five new coordination compounds of Germanium(IV) and 3d-metals with 1-hydroxyethane-1,1-diphosphonic acid and 1,10-phenanthroline, which in crystals are organic-inorganic hybrid ensembles with three-dimensional networks formed by numerous intermolecular hydrogen bonds between complex cations, anions, and crystalline water molecules.



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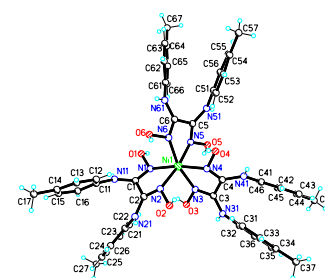
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MONO- AND BINUCLEAR COORDINATION COMPOUNDS OF Ni(II) AND Mn(II) WITH DIOXIMIC AND DICARBOXYLIC LIGANDS

Dumitru Ureche, Ion Bulhac, Pavlina Bourosh

Two new compounds - a mononuclear nickel(II) compound with diparatolyglyoxime (DpatH₂) - [Ni(DpatH₂)₃][SO₄·1,4-H₂bdc·2.5DMF·H₂O] (1) and a binuclear manganese(II) compound with dianilineglyoxime (DAnH₂) - [Mn₂(DAnH₂)₂(1,3-bdc)₂(DMSO)₄] (2) (1,4- and 1,3-bdc are 1,4- and 1,3-benzenedicarboxylic acids, respectively) have been obtained. The IR spectra of the complexes were studied and molecular and crystal structures of the compounds were determined by single crystal X-ray diffraction method. Compound 1 is ionic and contains a complex cation in which three neutral DpatH₂ ligands are coordinated to the nickel atom. Complex 2 is a molecular binuclear complex in which, in addition to the two neutral ligands DAnH₂ and four DMSO, two 1,3-benzenedicarboxylic anions are coordinated to the metal atoms in a bridging manner.



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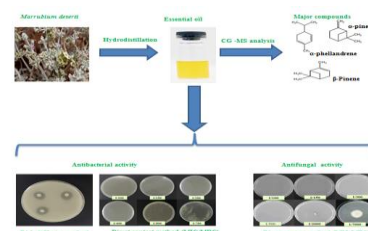
NATURAL PRODUCT CHEMISTRY AND SYNTHESIS

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CHEMICAL COMPOSITION AND ANTIMICROBIAL ACTIVITY OF MARRUBIUM DESERTI DE NOÉ ESSENTIAL OIL

Amina Mazeri, Achraf Khaldi, Mehdi Kheira, Adel Benarfa, Hadjer Saber

The essential oil of *Marrubium deserti* from Bechar (Algeria) was investigated to determine its chemical composition, physico-chemical characteristics, the antibacterial and antifungal activities. The findings showed that α -phellandrene (25.05%), β -pinene (14.05%), and α -pinene (12.83%) were the major compounds of this oil. Moreover, it was displayed that the studied essential oil has good antibacterial power as well as a strong inhibitory effect on spore sporulation, germination, and pathogen fungus development.



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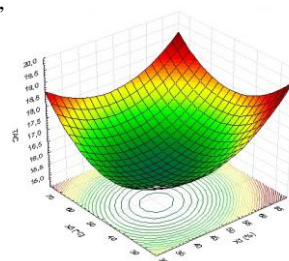
NATURAL PRODUCT CHEMISTRY AND SYNTHESIS

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OPTIMIZATION OF ULTRASOUND-ASSISTED EXTRACTION OF ANTIOXIDANT PHENOLICS FROM ALGERIAN TRIFOLIUM TOMENTOSUM L. USING RESPONSE SURFACE METHODOLOGY

Radia Hannache, Radia Ayad, Nassima Boutaoui, Hayat Bourekoua, Mostefa Lefahal, El Hani Makhoulfi, Nabila Souilah, Salah Akkal, Kamel Medjroubi

The current study aims to maximize the recovery of antioxidant phenolics from Algerian *Trifolium tomentosum* L. using an innovative green process: ultrasonic assisted extraction (UAE). Using response surface methodology (RSM), the optimal UAE parameters for maximum responses (total phenolic content, total flavonoid content, and total antioxidant capacity) were 70% ethanol concentration, 30.45 minutes of extraction time, and 75°C extraction temperature.



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NATURAL PRODUCT CHEMISTRY AND SYNTHESIS

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FATTY ACID ETHYL ESTERS AS BIODIESEL FUEL: PRODUCT QUALITY AND EFFICIENCY OF VARIOUS PURIFICATION TECHNIQUES

Lyubov Patrylak, Serhiy Konovalov, Stepan Zubenko, Angela Yakovenko, David Davitadze, Olexandra Pertko

The efficiency of removing glycerol, soaps, and unconverted acylglycerols from crude fatty acid ethyl esters by different techniques was evaluated. The proposed purification scheme allows for obtaining a product that meets the quality indicators of EN 14214 and can be used as a biodiesel fuel component.



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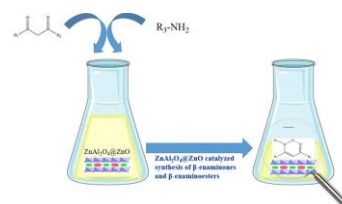
ORGANIC CHEMISTRY

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ZnAl₂O₄@ZnO AN EFFECTIVE, HETEROGENEOUS CATALYST FOR THE SYNTHESIS OF BIS-(β -ENAMINONES) AND BIS-(β -ENAMINOESTERS)

Mohamed Anouar Harrad, Adnan Semane, Mohammed Badereddine, Abdessamad Tounsi

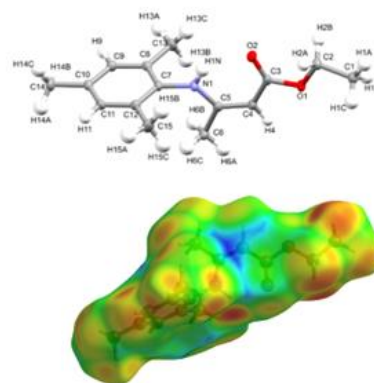
With ZnAl₂O₄@ZnO as a catalyst, an environmentally eco-friendly and highly effective method was developed for regio- and chemo-selective bis enamination of 1,3-dicarbonyl compounds and aromatic, aliphatic primary amines. A wide variety of bis-(β -enaminones) and bis-(β -enaminoesters) can be synthesized using this highly versatile method which offers good yields.



SYNTHESIS, CHARACTERIZATION, HIRSHFELD AND ADMET ESTIMATION STUDIES OF NOVEL 3-(2,4,6-TRIMETHYL-PHENYLAMINO)-BUT-2-ENOATE

Mohamed Loughzail, Koffi Senam Etsè, Zaragoza Verez Guillermo, Rachid Touzani, Anna Moliterni, Mohamed Anouar Harrad, Abdessamad Tounsi

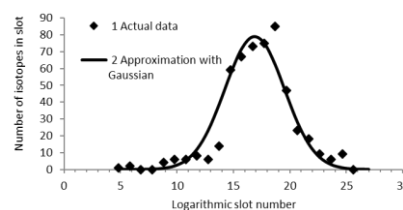
The compound 3-(2,4,6-trimethyl-phenylamino)-but-2-enoate was obtained by the condensation reaction of ethyl acetoacetate and 2,4,6-trimethyl-phenylamine. X-ray structural analysis identified the structure of the synthesized β -enaminoester, NMR spectroscopy complemented it, and the structure stabilised by intramolecular interactions. The intermolecular contacts were further analysed by the mapping of contacts descriptors d_{norm} , d_e , d_i , the shape-by-Shape index and surface property by electrostatic potential mapped on the Hirshfeld surface (HS). Global reactivity factors such as electronegativity, chemical hardness, potential, and softness were calculated using density functional theory. The effects of the molecular environment were accessed by analysing the electrostatic potentials surface mapped over the HS and the 3D-topology of energy frameworks. As a potential bioactive molecule, the physicochemical and ADME-Tox predictions were performed suggesting that compound **3** could be considered a promising drug candidate.



CHEMICAL PERSPECTIVE ON RADIONUCLIDE EMISSIONS AS ATMOSPHERIC CONTAMINANTS FROM NUCLEAR REACTORS

Sergey Travin, Gheorghe Duca, Oleg Gromov

This study investigates the radionuclide emissions from nuclear power plants (NPPs), focusing on the gas-aerosol emissions from reactors such as VVER-440. The radionuclide composition of these emissions is analyzed to determine the biological hazards they pose, particularly focusing on isotopes such as tritium and radiocarbon. The research highlights the patterns of radionuclide accumulation in fuel assemblies using “rank-size” coordinates, which provide a more visual and informative method compared to traditional atomic weight dependency analyses.



ASSESSING THE CHEMICAL COMPOSITION OF NATURAL WATER USING ANALYTICAL CHEMISTRY TECHNIQUES. A CASE STUDY IN THE ORHEI DISTRICT, REPUBLIC OF MOLDOVA

Victor Ciomea, Silvia Eftodi, Corneliu Cojocaru, Elena Zubcov

This study assessed water quality in Cișmea, Orhei district (coordinates 47°24'56.0"N 28°45'05.9"E). Surface and underground water were analysed for pH, conductivity, hardness, chloride, sulfate, and chemical elements. The concentration values of the 36 elements determined by the ICP-OES method are presented. Conductivity and sulfate deviations indicated high dissolved solids. Results revealed significant deviations from permissible levels: As (1.7–1.9x), Cd (3.4–3.5x), Pb (1.2–2.3x), Na (1.2–4.0x), and B (1.6–3.3x). Notably, Ba, Tl, and Bi concentrations were also detected.

