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#### ACADEMICIAN AURELIAN GULEA - ARCHITECT OF MODERN CHEMISTRY: A LIFE DEVOTED TO KNOWLEDGE

Gheorghe Duca, Tudor Lupascu, Aculina Aricu, Fliur Macaev

### EDITORIAL

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#### A LIFE DEDICATED TO COORDINATION CHEMISTRY AND SCIENTIFIC CONTINUITY

(Dedicated to the 80<sup>th</sup> anniversary of Doctor habilitate Ion Bulhac.)

Aculina Aricu, Maria Cocu, Tudor Lupascu, Eduard Coropceanu, Olga Danilescu, Dumitru Ureche

### REVIEW PAPER

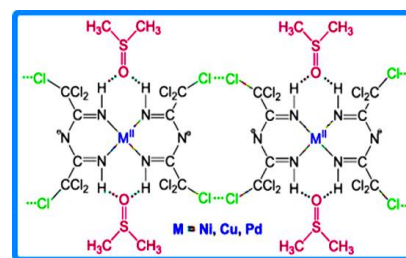
#### INORGANIC AND COORDINATION CHEMISTRY

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#### THE ROLE OF HALOGEN BONDING IN THE SYNTHESIS AND DESIGN OF TAP COMPLEXES

Namiq Shikhaliyev, Ayten Niyazova, Abel Maharramov, Agaisa Askerov, Nazrin Zeynalli, Viktor Khurstalev, Peri Huseynova

This review highlights the crucial role of halogen bonding in governing the synthesis, crystal engineering, and supramolecular self-assembly of 1,3,5-triazapentadiene (TAP) metal complexes. It covers synthetic strategies, the  $\sigma$ -hole model, cooperative non-covalent interactions, and diverse functional applications including catalysis and material design.



### RESEARCH PAPER

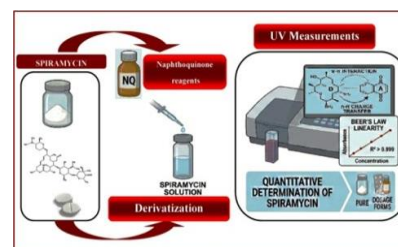
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#### NOVEL INDIRECT SPECTROPHOTOMETRIC APPROACHES FOR SPIRAMYCIN QUANTIFICATION IN DOSAGE FORMS USING NAPHTHOQUINONE DERIVATIVE REAGENTS

Abdelghani Mahmoudi, Silvia De Francia, Yamina Boudinara, Hela Mahmoudi, Peixi Zhu

New spectrophotometric techniques using charge-transfer reactions between naphthoquinone reagents and spiramycin were developed and validated according to ICH guidelines. These procedures were successfully applied to the analysis of spiramycin in pharmaceutical formulations. The suggested approaches are simple, effective, and trustworthy enough, and highlighting their utility in routine quality control.



### RESEARCH PAPER

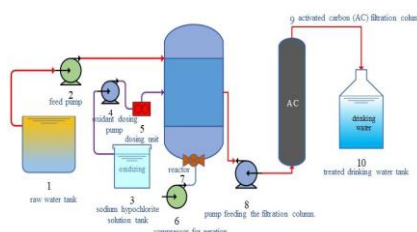
#### ECOLOGICAL CHEMISTRY

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#### GROUNDWATER QUALITY IN THE REPUBLIC OF MOLDOVA AND TECHNOLOGIES FOR ITS POTABILIZATION

Oleg Petuhov, Tatiana Mitina, Nadejda Bondarenco, Diana Grigoras, Tudor Lupascu

This paper summarizes data on the chemical composition of groundwater from artesian wells and phreatic wells across various regions of the Republic of Moldova. A comparative analysis of water samples was conducted to identify the parameters that most frequently exceed maximum permissible concentrations for both types of sources. Furthermore, the paper presents research findings on groundwater treatment technologies specifically targeting the removal of ammonia and ammonium ions.



RESEARCH PAPER

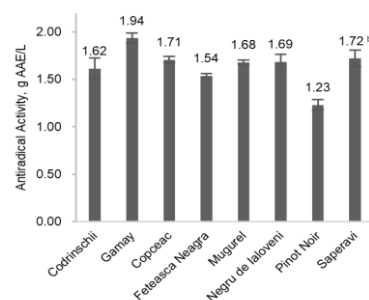
FOOD CHEMISTRY

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**PHYSICO-CHEMICAL CHARACTERIZATION AND ANTIRADICAL ACTIVITY OF MOLDOVAN DRY RED WINES: A CORRELATION STUDY**

Crina Vicol, Boris Morari, Nicolae Taran, Simona Nica, Gheorghe Duca

The physicochemical properties, phenolic composition, and antiradical activity of eight Moldovan dry red wines have been investigated to identify the key determinants of their radical scavenging capacity. Total phenolic content varied between 1.40 and 2.27 g GAE/L, with the highest values recorded in Gamay (Beaujolais), Codrinschii, and Saperavi wines. Gamay (Beaujolais) exhibited the highest anthocyanin content (1.256 g M3GE/L) and antiradical activity (1.94 g AA/E/L), while Codrinschii wine showed the greatest proanthocyanidin content (0.36 g CE/L). The antiradical activity correlated most strongly with the total phenolic content ( $R^2 = 0.9854$ ), anthocyanins ( $R^2 = 0.5739$ ), proanthocyanidin's content ( $R^2 = 0.4717$ ) and free  $SO_2$  ( $R^2 = 0.4216$ ).



RESEARCH PAPER

INDUSTRIAL CHEMISTRY

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**ANTI-CORROSIVE PROPERTIES OF VARIOUS ORGANIC AND INORGANIC INHIBITORS IN ELECTROLYTE FOR ZINC-AIR BATTERIES**

Priya Garg, Sudhish Kumar Shukla, Pradeep Kumar Varshney

Anti-corrosive additives reduce zinc corrosion in alkaline electrolytes, enhancing battery lifespan. Additives optimise electrode kinetics, increasing battery efficiency and overall performance. Citric acid with zinc acetate shows promising anti-corrosive properties. Optimization of additive formulations, scalability, and commercialisation are essential for widespread adoption.



RESEARCH PAPER

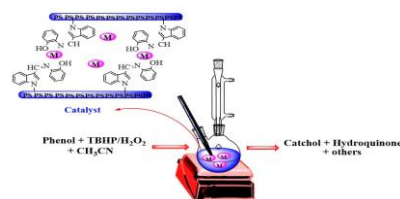
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**INDOLE-BASED SUPPORTED CATALYSTS FOR THE SELECTIVE PHENOL OXIDATION**

Savita Kumari, Praveen Kumar Gupta, Ram Karan, Amit Kumar, Ramesh Kumar

Indole based supported metal catalysts were synthesized and applied for selective phenol oxidation using TBHP and  $H_2O_2$ . PS-HIMAP-Cu achieved 97.2% conversion with 91.5% catechol selectivity, while PS-HIMAP-Ni offered 96.8% selectivity with  $H_2O_2$ . The catalysts demonstrated stability and reusability, providing an efficient platform for phenol valorisation and wastewater treatment.



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**STRUCTURAL DIVERSITY OF syn-2-PYRIDINEALDOXIME IN Cu(II) COORDINATION POLYMER WITH BIPYRIDINE AS AUXILIARY LIGANDS**

Aliona Vitu, Eduard Copceanu, Paulina Bourosh

Copper(II), syn-2-pyridinealdoxime (PaoH), and 4,4'-bipyridine (bpy) react to form a one-dimensional (1D) cationic coordination polymer. The structure consists of tetranuclear units interconnected by *in situ* generated PaoH ligands and further extended by bpy linkers. Nitrate anions, DMF, and water molecules are involved in hydrogen-bonding interactions with the metal complex. These intermolecular interactions were analysed and quantified using Hirshfeld surface analysis.



RESEARCH PAPER

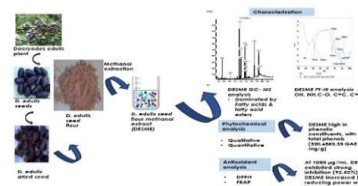
NATURAL PRODUCT CHEMISTRY AND SYNTHESIS

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**PHYTOCHEMICAL PROFILING AND *IN VITRO* ANTIOXIDANT ACTIVITY OF DACRYODES EDULIS SEED FLOUR METHANOL EXTRACT**

Emmanuel Nnamdi Ifedi, Olayombo Margaret Banwo, Olakunle Alex Akinsanoye, Oluwadurotimi Olotusin Akintade

*Dacryodes edulis* seed flour methanol extract (DESME) was analysed for bioactive compounds and antioxidant properties. GC-MS analysis identified fifteen compounds, with 9-Octadecenoic acid as the most prominent. Phytochemical analysis revealed a high phenolic content of  $320.68 \pm 0.33$  GAE mg/g and strong antioxidant inhibition (92.52%).



RESEARCH PAPER

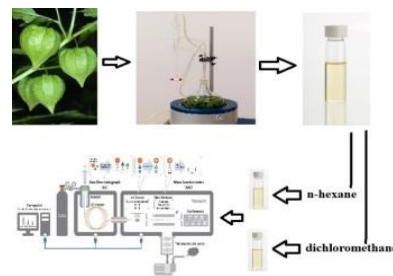
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**SOLVENT-DEPENDENT CHEMICAL PROFILING AND ANTIMICROBIAL ACTIVITY OF N-HEXANE AND DICHLOROMETHANE EXTRACTS DERIVED FROM HYDRODISTILLED ESSENTIAL OIL OF *PHYSALIS ANGULATA* L. FRUITS**

Atabek Bayniyazov, Utkir Kurbanov, Gulbaxar Tilovova, Bakhtiyar Abdurakhmanov, Ravshanjon Khalilov, Munira Allaeva, Jaloliddin Abdurakhmanov, Dilmurodjon Turdaliyev, Shakhnoz Azimova

The chemical composition of essential oils from *Physalis angulata* L. fruits from Parkent district was investigated by GC–MS. The n-hexane extract contained 59 compounds (96.3%), predominantly fatty acids, with n-hexadecanoic acid (21.13%) and conjugated linoleic acid (9.46%) as major constituents. The dichloromethane extract contained 34 compounds (80.15%), mainly oxygenated volatiles, including 1-hexanol (24.03%), furfural (6.04%), and 3-hexen-1-ol (5.10%). Solvent polarity influenced extraction selectivity, with n-hexane enriching fatty acids and dichloromethane favouring oxygenated compounds. The dichloromethane extract showed the strongest antimicrobial activity against *Bacillus subtilis* ( $19 \pm 0.12$  mm), while the n-hexane extract was less active. These findings demonstrate that solvent-dependent extraction shapes the chemical composition and antimicrobial potential of *P. angulata* fruit essential oils.



RESEARCH PAPER

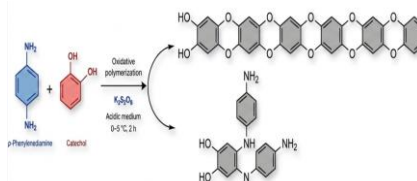
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**SYNTHESIS AND CHARACTERIZATION OF A CONJUGATED MULTIFUNCTIONAL OLIGOMER DERIVED FROM PARA-PHENYLENEDIAMINE AND CATECHOL**

Ramil Rzayev, Natalia Sucman, Eduard Monaico, Ion Geru, Alina Nicolescu, Calin Deleanu, Valentin Batr, Bakhtiyar Mammadov, Rena Akhmedova, Fliur Macaev

A conductive nano-oligomer was synthesized *via* oxidative polymerization of *p*-phenylenediamine and catechol in acidic and alcohol medium using potassium persulfate as oxidizing agent. The material exhibits enhanced thermal stability, electrical conductivity, and nanoscale morphology, making it promising for applications in sensors, energy storage, and advanced functional materials.



RESEARCH PAPER

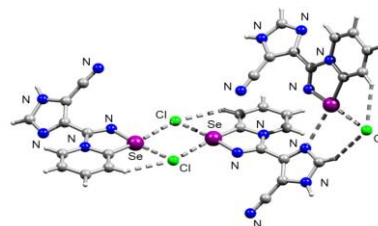
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**IMIDAZOLE-FUNCTIONALIZED PYRIDINIUM-FUSED SELENADIAZOLIUM SALTS AS VERSATILE CHALCOGEN BOND DONORS**

Evgeny Dukhnovsky, Namiq Shikhaliyev, Alexander Saponov, Alexey Kubasov, Alexander Novikov, Alexander Tskhovrebov, Gulnaz Mirzayeva

Novel imidazole-functionalized pyridinium-fused selenadiazolium salts were synthesized. X-ray structures display T-shaped selenium centres with  $\text{Se} \cdots \text{Cl}/\text{O}$  chalcogen bonding interactions. The monocationic salt assembles into a 1D supramolecular polymer *via*  $[\text{Se} \cdots \text{Cl}]$  dimerization and  $\text{Se} \cdots \text{N}$  interactions.



INSTRUCTIONS FOR AUTHORS

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