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THE SCIENTIFIC AND MANAGERIAL IDEAS OF ACADEMICIAN GHEORGHE DUCA ARE REALIZED SUCCESSFULLY BECAUSE THESE ARE BASED ON KNOWLEDGE

Tudor Lupascu and Aculina Aricu

INVITED PAPER

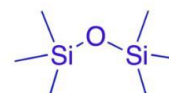
ECOLOGICAL CHEMISTRY

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ENTEROSORPTION IN THE TREATMENT OF HEAVY METAL POISONING

Sergey Mikhailovsky, Oleksandr Voytko, Violetta Demchenko, Pavlo Demchenko

Enterosorption is a cost-effective and efficient approach to reducing the impact of chronic exposure to heavy metals and radionuclides. As an auxiliary method to medical treatment, it can protect population chronically exposed to the intake of heavy metals or radioactivity due to industrial activities or in the aftermath of technogenic or natural accidents. This paper assesses the current state of the art in the treatment of acute and chronic heavy metal poisoning.



The core structural unit of silica

REVIEW PAPER

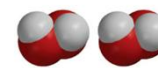
ECOLOGICAL CHEMISTRY

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HYDROGEN PEROXIDE IN ECOLOGICAL AND ENVIRONMENTAL CHEMISTRY

Gheorghe Duca

This review paper is focused on the detailed consideration of the structure, properties and reactions of H_2O_2 . The paper highlights the importance of revealing these processes' mechanisms, since they have been insufficiently studied so far, or the related data have a fragmentary and incomplete character. A special attention is given to catalytic oxidation reactions, formation and properties of intermediates, their role in the natural environment.



hydrogen peroxide

RESEARCH PAPER

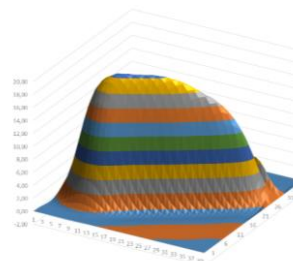
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APPLICATION OF THE MONTE-CARLO METHOD TO THE DESCRIPTION OF THE DYNAMICS OF THE SPREAD OF SALVO POLLUTION COMPLICATED BY ADSORPTION

Seghei Travin

The possibilities of application of the Monte-Carlo method for simulating the consequences of pollutants emissions with specific adsorption on the underlying surface were considered. Effective methods of obtaining kinetic curves for the concentration of a pollutant for a selected square on the field and constructing contamination profiles for a specified time are analysed. The estimation of the necessary parameters of the model for obtaining high-quality kinetic curves was performed and recommendations for their optimization are given. Specific fronts for the spot propagation were obtained and visualised.



RESEARCH PAPER

INDUSTRIAL CHEMISTRY

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PHYSICO-CHEMICAL PROPERTIES AND POSSIBLE APPLICATIONS OF SEWAGE SLUDGE COMBUSTION ASH

Andrey Panferov, Grigory Ivakhniuk, Alexandr Garabadzhiu

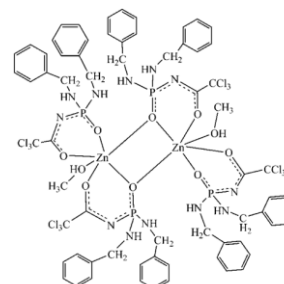
The main problems and prospects of water disposal systems of such a megalopolis as Saint Petersburg are considered. Methods for processing sewage sludge to an ecologically safe state, as well as the use of sludge combustion ash at the Central Aeration Station (CAS) in Saint Petersburg are proposed. Special attention was paid to the issues of sludge management in the sewage system of domestic wastewater. The possibility of using ash for extinguishing and eliminating oil spills at the CAS was confirmed experimentally in comparison with similar capabilities of marshalite and fine-grained construction sand.



SYNTHESIS AND CRYSTAL STRUCTURE OF NEW Zn(II) COMPLEX WITH N-[BIS(BENZYLAMINO)PHOSPHORYL]-2,2,2-TRICHLOROACETAMIDE

Valeria Zozulia, Vladimir Ovchynnikov, Tetiana Slyva, Julia Rusanova, Volodymyr Amirkhanov

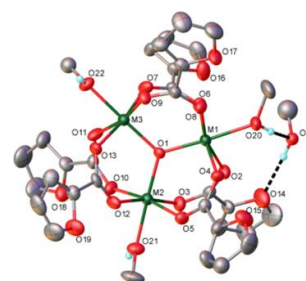
The novel binuclear Zn(II) complex of general formula $Zn_2(L)_4(CH_3OH)_2$, where L is N-[bis(benzylamino)phosphoryl]-2,2,2-trichloroacetamide has been synthesized from non-aqueous solution and characterized by elemental analysis, FTIR and NMR spectroscopy as well by X-ray single crystal diffraction. This complex represents the third example of binuclear complexes with this ligand within four known for today.



SYNTHESIS AND CHARACTERISATION OF NEW {Fe₂CrO} HETEROTRINUCLEAR IRON-CHROMIUM CLUSTERS

Viorina Gorinchoy, Olesca Cuzan, Silvia Melnic, Oleg Petuhov, Sergiu Shova

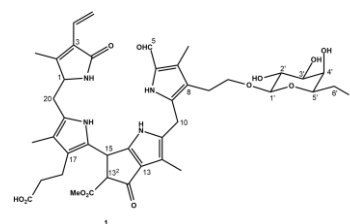
Two new μ_3 -oxo trinuclear heterometallic $Fe_2^{III}Cr^{III}$ complexes with furan-2-carboxylic and salicylic acids were synthesized with the composition: $[Fe_2CrO(C_4H_3O_2COO)_6(CH_3OH)_3]NO_3 \cdot 0.5CH_3OH$ and $[Fe_2CrO(C_6H_4(OH)COO)_7(CH_3OH)_2] \cdot 2DMA$ starting from Fe(III) and Cr(III) salts mixture. The complexes structures were confirmed by elemental analysis, IR, Mössbauer spectroscopies, and X-ray analysis. The atomic absorption spectroscopy confirmed that the iron: chromium ratio is 2:1. The thermal properties of both heteronuclear complexes have been investigated in oxidizing and inert atmospheres revealing the stability of the trinuclear core up to 170°C and 220°C, respectively.



β -D-GALACTOPYRANOSIDE SECO-PHYTOPORPHYRIN FROM ATROPA BELLADONNA AND SOLANUM TUBEROSUM YELLOW LEAVES DETERMINED BY NUCLEAR MAGNETIC RESONANCE

Nina Djapic

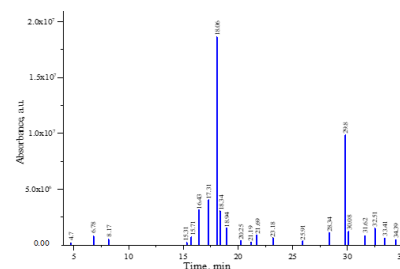
The study described the isolation of β -D-galactopyranoside seco-phytoporphyrin from *Atropa belladonna* and *Solanum tuberosum* yellow leaves. Column chromatography was applied for its isolation. The UV-Vis, mass spectrometry and NMR spectroscopy were used for the structure confirmation. The results demonstrate that the two plants that the same chlorophyll catabolite structure.



CHEMICAL COMPOSITION OF THE ESSENTIAL OIL AND ANTIMICROBIAL PROPERTIES OF CRUDE EXTRACT FROM TANACETUM CORYMBOSUM (L.) SHI. BIP.

Alexandru Ciocarlan, Lucian Lupascu, Aculina Aricu, Ion Dragalin, Nina Ciocarlan, Inga Zinicovscaia, Valerina Slanina, Nikita Yushin

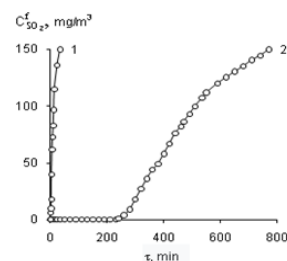
The GC-MS analysis of the essential oil from *Tanacetum corymbosum* revealed the presence of 38 compounds, including terpenes such as germacrene D, (Z)- β -farnesene, β -elemene, β -caryophyllene, aliphatic - palmitic and linoleic fatty acids, fatty alcohol n-octadecanol, higher alkane n-heneicosane as the major constituents. The in vitro antimicrobial assessment of the ethanolic extract showed promising antibacterial/antifungal activities against five Gram-(+), Gram-(-) and phytopathogenic bacteria species and two fungi strains. The data obtained in this study may be useful both for researchers and for producers interested in new or less studied species of medicinal plants in healthcare and their biological activities.



**SYNTHETIC ZEOLITES MODIFIED WITH SALTS OF TRANSITION METALS
IN THE REACTION OF CHEMISORPTION-CATALYTIC OXIDATION OF
SULPHUR DIOXIDE BY AIR OXYGEN**

Tatyana Rakitskaya, Tatyana Kiose, Lyudmila Raskola

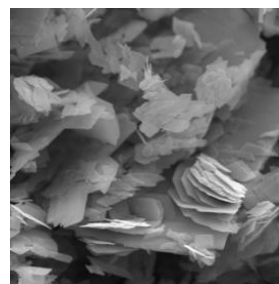
The effect of the nature and concentration of d-metal salts attached to synthetic zeolites NaA and KA on the kinetic and stoichiometric parameters of the chemisorption-catalytic oxidation of sulphur dioxide with air oxygen at ambient temperature was studied. It was found that the adsorption capacity of NaA zeolite relative to SO₂ is 100 times higher than that of KA zeolite; the time of protective action of NaA and KA zeolites increases upon modification with transition metal salts and with an increase of their content in the compositions. It was shown that the formation of inner and outer sphere complexes and the relationship between them is determined by the nature and concentration of metal ions and by the nature of the carrier. It was proven that the chemisorption-catalytic process ends with the oxidation of SO₂ to H₂SO₄.



V₂O₅ NANOPARTICLES FOR DYES REMOVAL FROM WATER

Thamer Adnan Abdullah, Tatjana Juzsakova, Rashed Taleb Rasheed, Ali Dawood Salman, Mohammadamad Adelikhah, Le Phuoc Cuong, Igor Cretescu

This paper deals with V₂O₅ nanoparticles adsorbents which were obtained by thermal pre-treatment carried out by increasing the temperature between 90 and 750°C. In order to obtain more detailed information on the surface chemistry of the newly prepared nanoparticles, the characterisation was done by X-ray diffraction and scanning electron microscopy, Fourier Transform infrared spectroscopy and thermogravimetric investigation technique. The prepared nanoparticles were tested for methylene blue (MB) removal from modelled water solutions. The obtained results indicated that increased MB removal efficiency (93%) and adsorption capacity (27 mg/g) after 40 minutes of adsorption were obtained for V₂O₅ annealed at 500°C. The applicability and suitability of the two kinetic models were tested and the removal mechanism was proposed.



**CHEMICAL COMPOSITION AND LIPOXYGENASE INHIBITORY ACTIVITY OF THE
ESSENTIAL OIL OF ALSTONIA ANGUSTILOBA**

Wan Mohd Nuzul Hakimi Wan Salleh, Muhammad Helmi Nadri, Shamsul Khamis

This study was aimed to investigate the chemical compositions and lipoxygenase inhibitory activity of the essential oil from *Alstonia angustiloba* growing in Malaysia. The essential oils were obtained by hydrodistillation and fully characterized by gas chromatography and gas chromatography-mass spectrometry. Analysis of the *A. angustiloba* essential oil resulted in the identification of twenty-five chemical components, attributed 90.8% of the total oil. The most abundant components of *A. angustiloba* oil were linalool (21.2%), 1,8-cineole (16.8%), α -terpineol (9.5%), terpinene-4-ol (8.5%), β -caryophyllene (6.2%), and caryophyllene oxide (5.2%). The essential oil displayed moderate activity towards lipoxygenase activity with IC₅₀ value of 45.8 μ g/mL.

