

ISSUE CONTENTS LIST WITH GRAPHICAL ABSTRACTS

RESEARCH PAPER

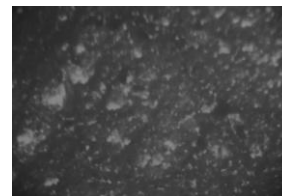
FOOD CHEMISTRY

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THE EFFECT OF STARTER CULTURE PRODUCING EXOPOLYSACCHARIDE ON PHYSICO-CHEMICAL PROPERTIES OF YOGHURT

Anatoli Cartasev, Valeriu Rudic

The purpose of this research was to investigate the impact of indigenous starter culture capable to synthesize exopolysaccharides (EPSs) on physicochemical properties of yoghurt. The microstructure, viscosity, EPS amount, structural properties and syneresis of yoghurt samples were assessed. It has been established that the EPS-producing starter culture provided a reduction of structural degradation and increased degree of structural recovery after deformation. Besides, it was observed that the use of EPS synthesized starter culture in yoghurt production restrains the syneresis of the gel.



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MORPHOLOGICAL AND THERMOANALYTICAL STUDY OF MODIFIED AVOCADO SEEDS STARCH WITH LACTIC ACID

Camila Delinski Bet, Lucas Henrique Waiga, Cristina Soltovski de Oliveira, Luiz Gustavo Lacerda, Egon Schnitzler

Avocado seeds starch was investigated after the modification with lactic acid using thermogravimetry and differential thermal analysis, differential scanning calorimetry, X-ray powder diffraction and scanning electron microscopy. After the modification, there was a decrease in the thermal stability of the starch, also the parameters measured by differential scanning calorimetry showed lower values. There was no difference in the morphology of the granules.



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INDUSTRIAL CHEMISTRY

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NEURAL MODELING AND OPTIMIZATION OF A MECHANICAL-CHEMICAL TREATMENT APPLIED FOR SOME INDUSTRIAL EFFLUENTS. A ROUMANIAN CASE STUDY

Rodica Mariana Diaconescu, Carmen Zaharia

The paper proposes an artificial neural network model of multilayers perceptron type (MLP3:10:1) adapted for mechanical-chemical treatment system of an industrial effluent (*i.e.* coagulation-flocculation - sedimentation applied for an industrial effluent produced in a manufacturing plant of bricks and other ceramics) which is further optimized and tested for its validation.

Active Performance	
MSE	0.000074725475
RMSE	0.00024217440
r	0.99988417601
% Error	0.366984080670
AIC	-743.650365420194
MDL	-731.190137992025

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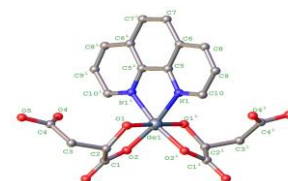
INORGANIC AND COORDINATION CHEMISTRY

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SYNTHESIS, STRUCTURE AND INVESTIGATION OF GERMANIUM(IV) AND COPPER(II) COMPLEXES WITH MALIC ACID AND 1,10'-PHENANTHROLINE

Inna Seifullina, Elena Martsinko, Elena Chebanenko, Eleonora Afanasenko, Viktoriya Dyakonenko, Svitlana Shishkina

Two crystalline compounds of germanium(IV) with malic acid (HMal) and 1,10'-phenanthroline (phen) - [Ge(HMal)₂(phen)]·phec·2H₂O (1) and [CuCl(phen)₂][Ge(OH)(HMal)₂] (2) were synthesized for the first time and characterized by elemental analysis, IR-spectroscopy and thermogravimetric analysis. Using single-crystal X-ray diffraction, it was elucidated that two different forms of germanium are implemented: Ge⁴⁺ (1) and hydrolyzed GeOH³⁺ (2) to form distorted octahedron and pyramid respectively.



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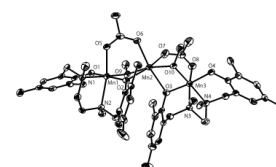
INORGANIC AND COORDINATION CHEMISTRY

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TRINUCLEAR MIXED-VALENT MANGANESE COMPLEX WITH NON-SCHIFF-BASE TETRADENTATE LIGAND SHOWING A FERROMAGNETIC COUPLING

Masahiro Mikuriya, Iyo Matsushima, Daisuke Yoshioka

Mixed-valent trinuclear manganese complex with *N,N'*-bis(2-hydroxy-3,5-dimethylbenzyl-*N,N'*-dimethyl-1,2-ethanediamine (H₂hdde), [Mn₃(hdde)₂(CH₃CO₂)₂(CH₃O)₂], was synthesized. The X-ray crystal structure analysis revealed a linearly arrangement of Mn^{III}-Mn^{II}-Mn^{III} core, where a ferromagnetic coupling ($J = 2.62 \text{ cm}^{-1}$) between the Mn^{III} and Mn^{II} ions.



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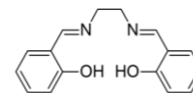
INORGANIC AND COORDINATION CHEMISTRY

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SYNTHESIS, OPTIMIZATION, CHARACTERIZATION AND ANTIMICROBIAL STUDIES OF Cu(II) AND Co(III) COMPLEXES OF BIS(2,2'-METHYLYLIDENEPHENOL)DIAMINOETHANE

Felix Sunday Nworie, Frank Ikenna Nwabue

A new synthetic extractive protocol for the synthesis of Cu(II) and Co(III) complexes of bis(2,2'-methylidenephenol)diaminoethane (H₂BMPDE) in a single simple step was performed. The obtained complexes were of 1:1 molar ratio of metal:ligand, with distorted square planar and distorted octahedral geometries. *In vitro* antibacterial screening revealed that the complexes were active against clinically important gram-negative bacteria (*Escherichia coli*, *Pseudomonas*) and gram-positive bacterium (*Staphylococcus aureus*). The synthesis of the complexes was optimized for industrial scale production.



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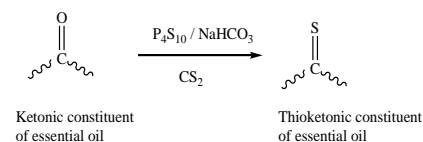
NATURAL PRODUCT CHEMISTRY AND SYNTHESIS

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THIONATION OF ESSENTIAL OILS FROM ALGERIAN ARTEMISIA HERBA-ALBA L. AND RUTA MONTANA L.: IMPACT ON THEIR ANTIMICROBIAL AND INSECTICIDAL ACTIVITIES

Nassiba Fekhar, Hocine Boutoumi, Mohamed Krea, Saâd Moulay, Driouche Asma, Zoubir Benmaamar

Essential oils were extracted from *Artemisia herba-alba* L. and *Ruta montana* L. by means of steam distillation and thionated with a reagent combination of phosphorus pentasulfide and sodium bicarbonate. The antimicrobial activity of essential oils was substantially improved upon thionation. The insecticidal effect of the thionated essential oil from *Ruta montana* L. was observed to be very significant, but that of the essential oil from *Artemisia herba-alba* L. was observed to decrease.



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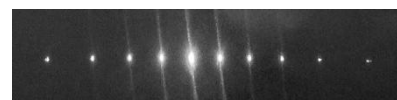
PHYSICAL CHEMISTRY AND CHEMICAL PHYSICS

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INFLUENCE OF SOFTENING TEMPERATURE OF AZOBENZENE POLYMERS AND EXTERNAL ELECTRIC FIELD ON DIFFRACTION EFFICIENCY OF POLARIZATION HOLOGRAMS

Nicolay Davidenko, Irina Davidenko, Nicolay Kuranda, Elena Mokrinskaya, Valeriy Pavlov, Viacheslav Solntsev, Sergey Studzinsky, Vladimir Syromyatnikov, Vitaliy Tarasenko, Nicolay Chuprina

Growth of the diffraction efficiency and recording velocity was found in the films of copolymers 4-((2-nitrophenyl) diazenyl)phenylmethacrylate) with octylmethacrylate at room temperature holographic recording for copolymer with less softening temperature. Effect of strengthening of the diffraction efficiency was observed when charging surface of the films with recorded hologram in crown discharge.



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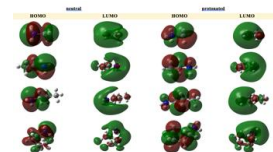
PHYSICAL CHEMISTRY AND CHEMICAL PHYSICS

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UNTANGLING THE INHIBITION EFFECTS OF ALIPHATIC AMINES ON SILVER CORROSION: A COMPUTATIONAL STUDY

Emre Topal, Gökhan Gece

In this study, the dependence of the inhibition effect of four aliphatic amines (methylamine, ethylamine, *n*-propylamine, and *n*-butylamine), on their molecular and electronic structure is analysed using quantum chemical calculations. The obtained results of these calculations were found to be consistent with the experimental findings.



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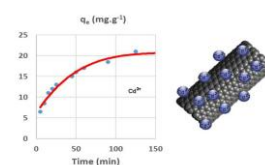
PHYSICAL CHEMISTRY AND CHEMICAL PHYSICS

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ADSORPTION OF CADMIUM IONS FROM WATER ON DOUBLE-WALLED CARBON NANOTUBES/IRON OXIDE COMPOSITE

Karima Seffah, Amel Zafour-Hadj-Ziane, Abdelghani Tarek Achour, Jean-François Guillet, Pierre Lonchambon, Emmanuel Flahaut

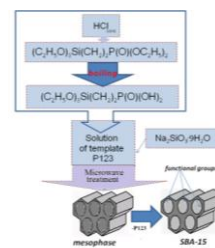
A new material (DWCNT/iron oxide) for heavy metals removal was developed. Batch experiments were applied in order to evaluate adsorption capacity of the DWCNT/iron oxide composite for cadmium ions. The influence of operating parameters such as pH value, amount of adsorbent, initial adsorbate concentration and agitation speed was studied.



SYNTHESIS OF SBA-15 TYPE ORGANOSILICA SORBENTS USING SODIUM METASILICATE AND PHOSPHONIC ACID RESIDUES

Oksana Dudarko*, Yuriy Zub

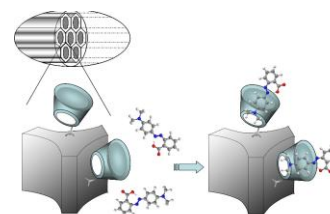
The direct template method was used for synthesis of mesoporous organosilica sorbents of SBA-15 type with phosphonic acid groups using sodium metasilicate (SS) as a source of silica. This approach allowed producing relatively cheap materials with ordered structure, developed specific surface (550-700 m²/g) and high sorption volume (0.74-0.81 cm³/g). Optimal ratio of sodium metasilicate (SS):diphosphoethyltriethoxysilane (DPTS) for synthesis of SBA-15 type organosilicas with phosphonic acid residues was found to be 10:2.



NEW MESOPOROUS MATERIALS WITH SURFACE SUPRAMOLECULAR CENTRES FOR METHYL RED SORPTION

Nadiia Roik, Lyudmila Belyakova, Marina Dziazko, Iryna Trofymchuk

MCM-41-type silicas were obtained by template-assisted condensation of TEOS and β -CD-silanes. Removal of methyl red from phosphate buffer solutions was studied as a function of pH and dye equilibrium concentration. Introduction of cyclic oligosaccharide in silica surface layer leads to the enhancement of sorption efficiency towards methyl red.



SYNTHESIS AND CRYSTAL STRUCTURES OF LUMINESCENT MONONUCLEAR Ni(II) AND Cd(II) COMPLEXES WITH 1,10-PHENANTHROLINE

Ecaterina Tocana, Anatolii Siminel, Lilia Croitor

New supramolecular systems of Ni(II) and Cd(II) with 1,10-phenanthroline constructed by non-covalent interactions have been synthesized and characterized by single-crystal X-ray diffractometry. The smaller nickel(II) ion forms a *cis* complex with outer-sphere perchlorates, while the cadmium(II) ion forms a *trans* complex involving inner-sphere perchlorates. Both compounds reveal intraligand-based luminescent properties.

