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NEWS AND EVENTS

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FIRST ANNOUNCEMENT - THE XVIIIth INTERNATIONAL CONFERENCE "PHYSICAL METHODS IN COORDINATION AND SUPRAMOLECULAR CHEMISTRY"

October 2015, Chisinau, Republic of Moldova

FULL PAPER

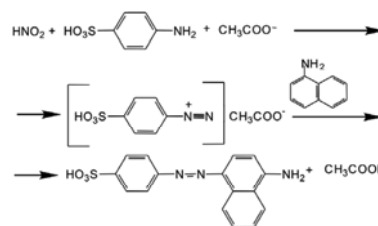
ANALYTICAL CHEMISTRY

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METHOD FOR NITRATE DETERMINATION IN WATER IN THE PRESENCE OF NITRITE

Maria Sandu, Tudor Lupascu, Anatol Tarita, Tatiana Goreacioc, Sergiu Turcan, Elena Mosanu

The study relates to determination of nitrate in presence of nitrite in water and can be used in the quality monitoring of natural water (surface and groundwater), drinking water, water from fish farms and public aquaria where autonomous filters is used. The nature and quantity of reagents used have insignificant impact on natural waters and sewages. According to the investigation, the method includes the removal of nitrite from the solution/water with sulfaminic acid, the nitrate ion reduction to nitrite using a reducing mixture that contains Na_2SO_4 and zinc dust in ratio of 100:5 and determining the nitrite with the Griess reagent.



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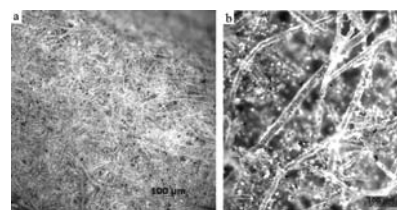
ANALYTICAL CHEMISTRY

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STUDY OF SOME ARCHAOMETRIC CHARACTERISTICS USED IN PANEL PAINTING ICONS AUTHENTICATION

Raluca Anamaria Cristache, Ana Maria Budu, Petronela Spiridon, Viorica Vasilache, Ion Sandu

The authentication of cultural heritage assets is a complex process of scientific investigation which regards obtaining information about: author (painter), the period when it was made, the owners and other data related to the main contexts of their evolution in time (routes travelled). This work presents a comparative study of the paper used in the preparation layer of three icons painted in Russian style. As an analysis techniques were used the micro and macro photography assisted by Optical Microscopy (OM), SEM-EDX and micro-FTIR.



FULL PAPER

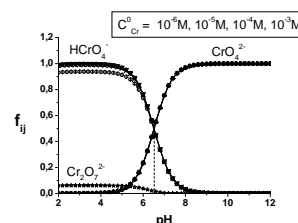
ECOLOGICAL CHEMISTRY

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DISTRIBUTION OF SOLUBLE AND INSOLUBLE CHEMICAL SPECIES OF CHROMIUM (III) AND (VI) IN AQUEOUS SOLUTIONS

Oxana Spinu

On the basis of currently revised thermodynamic data for Cr(III) and Cr(VI) hydrolysis and photolytic equilibria in addition to original thermodynamic and graphical approach, used in this paper, the repartition of their soluble and insoluble chemical species has been investigated. By means of the diagrams " $\Delta G - \text{pH}$ ", the areas of thermodynamic stability of chromium(III) hydroxide have been established for a number of the analytical concentration of Cr(III) in heterogeneous mixtures. The obtained calculated results correlate well with existing experimental data.



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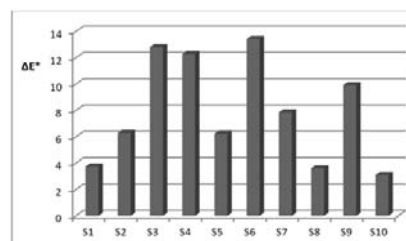
ECOLOGICAL CHEMISTRY

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ECOLOGICAL CLEANING SYSTEMS FOR OLD ICONS PAINTED IN TEMPERA

Silvea Pruteanu, Petronela Spiridon, Viorica Vasilache, Ion Sandu

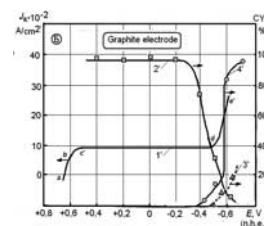
Old icons, especially those involved in liturgical rituals are affected in time by external agents factors (temperature, humidity, light, pollution, microbiological attack, abrasion etc.), resulting changes of the appearance. Based on the literature in the field, a series of alcoholic solutions of different concentrations were made, as such or basified, which were compared with ecologic synergic systems based on organic uncolored vegetable juices and decoctions from dried plants. The cleaning effectiveness was done by visual analysis and CIE $L^* a^* b^*$ reflection colorimetry, this technique permitting to determine by color deviations the critical point where the patina and polychromy.



APPLICATION OF FLOW-THROUGH THREE-DIMENSIONAL ELECTRODES FOR REGENERATION OF PLATING IRON ELECTROLYTES: 1. MATHEMATICAL MODEL

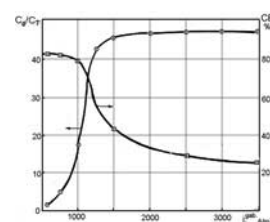
Alexandr Koshev, Olga Covaliova, Valery Varentsov

The mathematical model of electrochemical processes distribution within the three-dimensional flow-through electrode for the system Fe(III)/Fe(II)/Fe is described in this paper, considering also the electrochemical reactions of hydrogen and molecular oxygen reduction. The results of calculations and experimental studies of iron electro-reduction are given, the analysis of the numerical modeling is provided.

**APPLICATION OF FLOW-THROUGH THREE-DIMENSIONAL ELECTRODES FOR REGENERATION OF PLATING IRON ELECTROLYTES: 2. STUDY OF PROCESS REGULARITIES BY MATHEMATICAL MODELING**

Olga Covaliova, Alexandr Koshev, Valery Varentsov

The main regularities of the electroactive components distribution, polarization and local current density within the depth of the three-dimensional flow-through electrode have been studied using the calculation method, in dependence on the overall current density, electrode thickness and degree of its compression, solution flow velocity through the electrode, initial concentration of Fe(III) ions in the solution and electrodes brand.

**SOIL POLLUTION LEVEL OF ECOLOGICALLY VULNERABLE AREAS AROUND KAJARAN TOWN AND WAYS OF THEIR IMPROVEMENT**

Karen Ghazaryan, Hasmik Movsesyan, Naira Ghazaryan, Gor Gevorgyan, Karlen Grigoryan

Kajaran town is situated in the south-east of the Republic of Armenia in Syunik Marz. Developed mining and smelting industries can be observed in this area. Six the most risky sites in this area and an unpolluted site as a control were selected for the study. The content of metals was determined by means of ELAN 9000 ICP-MS System. Study results revealed the increase up to 17 times in contents of following metals: Co, Ni, Cu, Zn, Cr, Sr, Mo, Cd, Pb, As. Experiments have led us to the assumption that pollution of soils with heavy metals in the studied territory is conditioned by human activities, particularly by mining and smelting industry.

REMOVAL OF DIVALENT IRON AND MANGANESE IONS AND HYDROGEN SULFIDE FROM GROUNDWATER

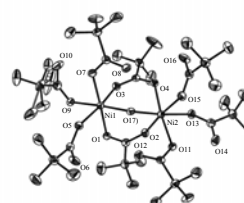
Tudor Lupascu, Mihail Ciobanu, Victor Botan

Processes of removal of divalent ions of iron and manganese and hydrogen sulfide from groundwater at various pH values and temperature were studied. Obtained results have been used in order to elaborate a process of groundwater purification from the mentioned pollutants. The use of elaborated process for natural water leads to the decrease of the content of iron, manganese and hydrogen sulfide below the maximum allowable concentrations.

DINUCLEAR NICKEL(II) PIVALATE WITH μ -AQUA AND DI- μ -PIVALATO BRIDGES SHOWING A FERROMAGNETIC INTERACTION

Masahiro Mikuriya, Melissa Schumacher, Chinatsu Kawano, Takahiro Akihara, Kenta Ono, Daisuke Yoshioka, Hiroshi Sakiyama, Makoto Handa

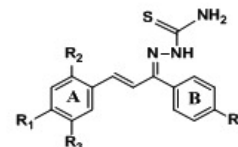
Dinuclear nickel(II) pivalate with μ -aqua- and di- μ -pivalato-bridges having monodentate pivalato and monodentate pivalic acid molecules, $[\text{Ni}_2\{\text{O}_2\text{CC}(\text{CH}_3)_3\}_4(\text{OH}_2)\{\text{HO}_2\text{CC}(\text{CH}_3)_3\}_4]$, was prepared and characterized by elemental analysis and IR and UV-Vis spectroscopies, temperature dependence of magnetic susceptibilities (4.5—300K), and single-crystal X-ray crystallography. The magnetic data analysis showed a ferromagnetic interaction between the two nickel atoms.



SUBSTITUTED 1,3-PHENYL(PYRIDYL) PROPENONES AND DERIVATIVES WITH THIOSEMICARBAZIDIC GROUPS. STRUCTURE – (HL-60) ANTILEUKEMIA ACTIVITY RELATIONSHIP

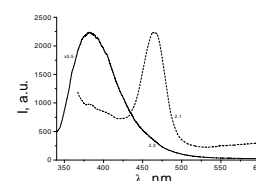
Ana Popusoi, Nicanor Barba, Aurelian Gulea, Jenny Roy, Donald Poirier

3-(4-(Dimethylamino)phenyl)-1-(4-isothiocyanatophenyl)prop-2-en-1-one was obtained from the corresponding N,N-dimethylthioureas by elimination of dimethylamine at heating with gaseous hydrogen chloride in chloroform and 1-(4-isothiocyanatophenyl)-3-(pyridin-2-yl)prop-2-en-1-one by treating 1,1-dimethyl-3-(4-(3-(pyridin-2-yl)-acryloyl)-phenyl)thiourea with acetic anhydride. For all obtained compounds in the course of reaction the antileukemia activity was investigated.

**POLYMER NANOCOMPOSITE BASED ON STYRENE WITH BUTYL METHACRYLATE AND INORGANIC SEMICONDUCTOR CdS**

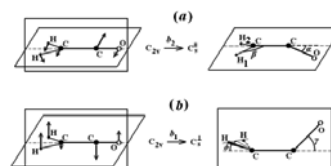
Mihail Iovu, Mihai Enachescu, Ion Culeac, Victor Verlan, Stefan Robu, Dionezie Bojin, Iurie Nistor, Ion Cojocaru

We present experimental results on copolymer-based nanocomposite made of styrene with butyl methacrylate (1:1) and inorganic semiconductor CdS. Thin film composite samples have been characterized by UV-Vis absorption and photoluminescent spectroscopy, as well as by transmission electron microscopy.

**ELECTRONIC CONTROL OF MOLECULAR CONFIGURATION INSTABILITY VIA VIBRONIC COUPLING. PSEUDO JAHN-TELLER STABILIZATION OF VERTICALLY EXCITED STATES OF F₂CO, N₂H₂ AND H₂C₂O MOLECULES**

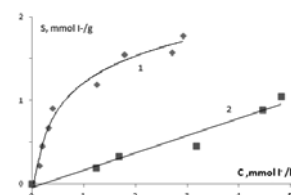
Natalia Gorinchoy

The pseudo Jahn-Teller effect is employed to explain the origin of structural distortions of carbonyl fluoride, diazene and ketene molecules in the lowest singlet and triplet excited states. It was shown that in all the cases the distortions of the molecules in the excited states are due to the vibronic mixing of considered states with the appropriate by symmetry higher-lying excited states.

**IODIDE IONS SORPTION ON POLYMER AV-17(Cl) AND SORBENT AV-17(Bi)**

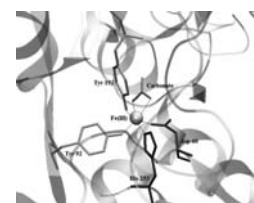
Vasile Gutsanu

The iodide ions sorption from solutions of KI and KI in excess of KCl has been investigated. The strongly basic anion exchangers AV-17 in Cl⁻ form and Varion AD in NO₃⁻ form were used as sorbents. Also AV-17 polymer modified with Bi(III)-containing compounds were used. The sorption was performed in static and dynamic conditions. Isotherms are approximated with BET sorption model. The sorption value of iodide ions in the KI solutions with KCl in excess is quite high. It was established that sorption of iodide ions in the form of polyiodide occurs both as a result of anion exchange and as a result of chemisorption.

**LACTOFERRIN: ANALYSIS OF THE STRUCTURE PROFILE**

Lilia Anghel

The multitude of physiological processes in which the binding of iron ions takes part makes its mechanism worth investigating. The multiple sequence alignment method was applied to investigate the structure similarities of five lactoferrin X-ray crystallographic structures and outline the differences and similarities between lactoferrin and serum transferrin. The results of this study provide useful insights into the mechanism of iron-binding of lactoferrin molecule.



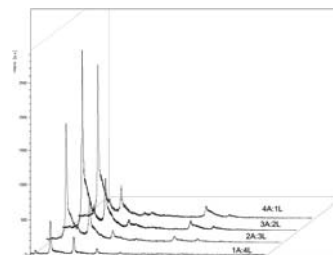
SHORT COMMUNICATION**PHYSICAL CHEMISTRY AND CHEMICAL PHYSICS**

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MALDI-TOF INVESTIGATION OF LYSOZYME-ALBUMIN INTERACTION

Marharyta Vasylieva, Taras Gromovoy

Proteins are the main components of living systems therefore they are a subject of study from different points of view. Under certain conditions, proteins are capable of self-organization forming oligomeric structures of various composition and new properties. The investigations of these transformations were carried out on two well known proteins: albumin and lysozyme. It is shown that associates of albumin and lysozyme are forming in the stoichiometric ratios of 1:1, 1:2, 1:3, 1:4. A similar pattern is observed in the case of albumin dimer.

**IN MEMORIAM**

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**IN MEMORY OF CORRESPONDING MEMBER OF ACADEMY OF SCIENCES OF MOLDOVA
PROFESSOR MIHAIL REVENCO**

Gheorghe Duca, Tudor Lupascu

A dedication in memoriam of corresponding member of the Academy of Sciences of Moldova, Professor, Doctor Habilitatus Mihail Revenco (1947-2014). Scientific work and practical results of Professor Mihail Revenco were deservedly appreciated by superior bodies, being awarded the National Award in Science and Technology (1995), Order of "Emeritus" of the Republic of Moldova (1996), "Dimitrie Cantemir" Medal (2006), "Paisie Velcikovsky" Medal (Poland 2011), the Memorial Award "Yurii Simonov" (2012). In 2012, for outstanding results, through Presidential Decree, Professor Mihail Revenco was awarded the Order "Labour Glory".

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INSTRUCTIONS FOR AUTHORS