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ABSTRACTS

O.G. KARMANOVA, P.P. MUKOVOZ, V.O. KOZMINYKH, E.N. KOZMINYKH
SYNTHESIS AND STRUCTURE OF 2,3-BIS-(2-OXOALKYLIDENE)-TETRAHYDRO-1,2,3,4-
QUINOXALINES

The 2,3-bis-(2-oxoalkyliden)-tetrahydro-1,2,3,4-quinoxalines were obtained with the condensation of alkyl methyl ketones with diethyl oxalate and 1,2-diaminobenzene. Using spectral methods the four isomeric forms were revealed. Structure peculiarities of synthesized compounds are discussed.

Key words: 2,3-bis-(2-oxoalkyliden)-tetrahydro-1,2,3,4-quinoxaline, alkyl methyl ketones, 1,2-diaminobenzene, one-pot synthesis

A.G. BUBNOV, S.A. BUIYMOVA, V.I. GRINEVICH, N.I. ZHURAVLEVA
ASSESSMENT OF DETRIMENT TO POPULATION HEALTH BECAUSE OF CHEMICAL POLLUTION OF WATER AND FOOD STUFFS

The information on the discrepancy of quality of some food stuffs to regulatory requirements was presented for meat and milk products produced on four agricultural enterprises of Ivanovo and Kostroma regions as an example as well as the water from springs located in the Ivanovo and Kokhma cities of Ivanovo region. The assessment of risk value and expected reduction of life time of the population was carried out. The methodology of assessment of economic detriment caused to the health of the population from the consumption of these products was offered.

Key words: economic detriment, health risk, meat and milk products, water quality, spring

M.Z. ZARIFYANOVA, I.SH. KHUSNUTDINOV, I.V. ARISTOV, P.I. GRYAZNOV, S.D. VAFINA, A.V. KONSTANTINOVA
OIL SULFOXIDES. MESSAGE 1. ESTABLISHING CORRELATION DEPENDENCE OF CHARGE ON OXYGEN ATOM OF EXTRACTANT AND ITS EXTRACTION ABILITY ON BASE OF QUANTUM-CHEMICAL CALCULATIONS

The charges on the atoms in the molecules of acetophenone, tributyl phosphate, cyclic sulfoxides were calculated with methods of quantum-chemical calculations of MNDO and B3LYP/6-31G(d,p). It was shown that the molecules of cyclic sulfoxides have the highest value of negative charge on the oxygen atom. Correlation dependence between the charge on the oxygen atom of the extractant and its extraction ability was established.

Key words: quantum-chemical calculation, active atom charge, extraction ability, sulfoxides, molybdenum

O.V. GRECHIN, P.R. SMIRNOV, V.N. TROSTIN
X-RAY DIFFRACTION STUDY OF AQUEOUS SOLUTIONS OF LANTHANUM CHLORIDE AND NITRATE

The interpretation of the X-ray diffraction data are presented for aqueous solutions of chloride and nitrate of lanthanum in wide concentrations range. The origin of small-angle maxima of intensity are explained by manifestation of inter ionic distances which sequentially changing their contributions at dilution.

Key words: lanthanides aqueous solutions, structure, X-ray diffraction analysis, small angle peaks, radial distribution functions
V.V. YASINETSKIY, V.A. OGORODNIKOV, Yu.V. MATVEIYCHUK

INVESTIGATION OF THERMAL DECOMPOSITION OF HYDROXOCOMPOUNDS OF ZINC

Thermolysis of zinc carbonate hydroxide, amorphous and crystalline zinc hydroxide was studied by TG/DTA, DSC and in addition - by FT-IR spectroscopy. The decomposition minimum temperature, the heat effects was determined which is of practical importance in the development of methods for producing zinc oxide.

Key words: zinc hydroxide, zinc carbonate hydroxide, FT-IR spectroscopy, thermogravimetry, calorimetry

O.V. MALKOVA, V.G. ANDRIANOV

KINETICS OF ALKYL PHENYL DERIVATIVES COMPLEXATION OF Porphyrins WITH ZINC ACETATE IN ACETONITRILE

The kinetics of porphyrin derivatives complexation with alkyl-groups in different positions of phenyl rings in acetonitrile (AN) - Zn(Ac)₂ solutions at 298-318 K were studied. The constants of complexation of these porphyrins were determined. The kinetic parameters of the process (k, Eₐ, ΔS) for coordination reaction of porphyrins with Zn(Ac)₂ in AN were calculated.

Key words: alkyl phenyl porphyrin, complexation, acetonitrile, zinc acetate

A.E. BERDIEV, I.N. GANIEV, S.S. GULOV, M.M. SANGOV

OXIDATION KINETICS OF AK7M2 ALLOY DOPED WITH GERMANIUM IN SOLID STATE

Kinetics of oxidation of AK7M2 alloy doped with germanium with the air oxygen was studied by thermo gravimetric method. It was shown that oxidation of alloys obeys to the parabolic law. As products of allow oxidation the phases of SiO₂ and GeO₂ were detected along with γ-Al₂O₃.

Key words: AK7M2 alloy, germanium, thermo gravimetical method, oxidation kinetics, oxidation rate, activation energy

G.R. GURBANOV

STUDY OF SECTIONS OF GeSbBiTe₄-GeSb₇Te₇ AND GeSbBiTe₄-Ge₂Sb₂Te₅ OF GeTe-Sb₂Te₃-Bi₃Te₃ QUASI TRIPLE SYSTEM

For the first time, phase equilibria for GeSbBiTe₄-GeSb₇Te₇ and GeSbBiTe₄-Ge₂Sb₂Te₅ systems were investigated with the X-ray analysis, micro hardness and density on poly thermal sections of GeSbBiTe₄-GeSb₇Te₇ and GeSbBiTe₄-Ge₂Sb₂Te₅, which are quasi binary and partially quasi binary sections. On the base of initial components into sections the areas of solid solutions were determined. On the base of studies of temperature dependences of some electrical-physical parameters of GeSbBiTe₄ compound and solid solution of (GeSb₇Te₇)ₓ(GeSbBiTe₄)₁₋ₓ it was established that alloys are refered to semi conductors of n-type.

Key words: physical and chemical analyses, phase equilibria, GeTe-Sb₂Te₃-Bi₃Te₃ system, chemical transport reactions

M.D. PLOTNIKOVA, A.B. SHEIN

CORROSION INHIBITION OF LOW-CARBON STEEL IN ACID AND NEUTRAL MEDIA

The results of investigation of influence of some inhibitive compositions on electrochemical and corrosion behavior of steel St3 in acidic and neutral media by means of weight-loss, polarization and impedance methods are presented. Impedance spectra were described by equivalent circuits taking into consideration the inhibitive films on electrode surface. It has been shown that the investigated compositions are more effective in acidic media as compared with neutral media.

Key words: corrosion, inhibitor, protective action, impedance

B.I. KASHKAROV, S.N. YASHKIN, A.A. SVETLOV

DETERMINATION OF DISPERSION COMPONENT OF SURFACE FREE ENERGY OF MOLECULAR CRYSTALS OF FULLERENE C₆₀

With the method of inverse gas chromatography under conditions of extremely low concentrations of adsorbate in the gas phase at different temperatures the values of dispersion component of surface free energy,
entropy, and heats of adsorption of n-alkanes on the C\textsubscript{60} molecular crystals were determined. The values obtained were compared with those for graphitized thermal carbon black.

**Key words:** adsorption, fullerene molecular crystals, carbon adsorbents, surface free energy, free energy dispersion component, adsorption heat, adsorption entropy, ideal gas two-dimensional model

**N.S. BORISOVA, I.P. KOROLYOA, Yu.S. ZIMIN, A.R. GIMADIEVA, A.G. MUSTAFIN**

**SPECTROPHOTOMETRIC STUDY OF URACILS INTERACTION WITH APPLE PECTIN AND ITS OXIDATION PRODUCTS**

The complexation of apple pectin and low molecular weight products of its oxidation with uracils was studied by the ultraviolet spectrophotometric method in an aqueous medium. The composition of complexes was determined and their stability constants were calculated. The influence of the substituents nature in the molecule of 6-methyluracil on the stability of the forming complexes was studied.

**Key words:** complex formation, apple pectin, uracil and its derivatives, stability constant, UV-spectroscopy

**A.V. SOLOMONOV, E.V. RUMYANTSEV, B.A. KOCHERGIN, E.V. ANTINA**

**SPECTRAL STUDY ON INTERACTION OF ASCORBIC ACID WITH ALBUMEN AND ITS BILIRUBIN COMPLEX**

Using electronic absorption and fluorescence emission spectroscopy the interaction of ascorbic acid (ASC) with albumen (BSA) and its macromolecular complex with bilirubin (BR-BSA) was investigated. The interaction between proteins and ASC is provided by static quenching of fluorescence and has a predominantly hydrophobic character. The numerical values of binding constants of ASC-BSA and BR-BSA were 2.2·10\textsuperscript{4} and 1.5·10\textsuperscript{4} l/mol, respectively. The average distance between the donor (protein) and acceptor (ASC) was 1.67 and 2.07 nm, respectively. Synchronous fluorescence spectroscopy analyzes allowed to study the influence of ASC on the conformational changes of protein molecules.

**Key words:** bilirubin, ascorbic acid, bovine serum albumen, electronic spectroscopy, synchronous and emission fluorescence, fluorescence quenching, Stern-Volmer equation, Förster’s theory


**KINETICS OF OXIDATIVE POLYMERIZATION OF ANILINE IN AQUEOUS SOLUTIONS OF POLY-(N-VYNILPYRROLIDONE) OF VARIOUS MOLECULAR WEIGHTS**

The rate of oxidative polymerization of aniline was shown to increase with the increase of poly-(N-vynilpyrrolidone) molecular weight up to its definite value. The new kinetic model of oxidative polymerization of aniline up to deep conversions taking into consideration the system heterogeneity was proposed.

**Key words:** polyaniline, aniline, kinetics, poly-(N-vynilpyrrolidone)

**N.N. SMIRNOVA, A.N. STARIKOV**

**SPECTROSCOPIC STUDY OF INTERACTION OF SULFONATE-CONTAINING POLYPHENYLENPHTHALAMIDES WITH BASIC DYES IN AQUEOUS SOLUTIONS**

The interaction between sulfonate-containing polyphenylenepthalamides of different structure with basic dyes methylene blue and methyl violet in aqueous solutions was studied. Complexes of polymeric electrolytes with basic dyes were shown to mainly stabilize by Coulomb forces arising between functional groups of the polymers and the oppositely charged groups of dyes. The essential influence upon the interaction of poly-electrolyte with dye renders the structure of polyelectrolyte, the type of opposite ion of its functional groups and the ionic force of solution.

**Key words:** sulfonate-containing polyphenylenepthalamides, polyelectrolytes, dyes

**S.S. POPOVA, O.G. KOVALENKO, V.F. ABDULLIN**

**PECULIARITIES OF CHITOSAN BIOPOLYMER ELECTRODEPOSITION FROM ITS POLYELECTROLYTE SOLUTIONS**

The process of electrodeposition of chitosan biopolymer was studied and the conditions of its carrying out were determined. The identity of the electrodeposited chitosan chemical structure and the original powder were pointed out.

**Key words:** chitosan, chitin, biopolymer, electro deposition, polyelectrolyte, polysaccharide, amino group protonation
STUDIES OF COMPLEXATION PROCESSES OF SOME FUNCTIONALLY SUBSTITUTED ARYLHYDRAZONES BY METALLIC CATIONS

The processes of ionization and complex formation in ethanol-aqueous solutions for some functionally substituted arylhydrazones were studied with the help of spectrophotometric titration. The acidic dissociation constants of the organic molecules and the formation constants of their metalocomplexes were calculated.

Key words: arylhydrazones; complexation; spectrophotometric titration; acidic dissociation constants; formation constants

INFLUENCE OF CONDITIONS OF HYDROTHERMAL CRYSTALLIZATION ON SYNTHESIS AND PROPERTIES OF LTA TYPE ZEOLITE

The hydrothermal crystallization was shown to increase the content of crystalline phase of LTA zeolite from 55 to 95 % which was produced using methods of mechanochemical activation. The working solution of an alkali which is used at hydrothermal crystallization step was established to may be used repeatedly not less than 15 times. The dynamic activity on the water vapor of synthesized Zeolite was revealed to be from 18.9 to 20.5 g/100 g of sorbent. The mechanical strength was kept after 10 cycles of mechanical strength.

Key words: LTA zeolite, mechanochemical activation, hydrothermal crystallization, mechanical strength, dynamic activity

BROADENING BASE OF LOW-VISCOSITY MINERALIZING ADDITIVES – INDUSTRIAL WASTE

Results of study of rheological properties of the mineralizators in the temperature range of firing building ceramics are given. Formulated principles for evaluating the mineralizators allowed selecting, testing and recommending the series of promising industrial waste of aluminum segment containing a complex of low-viscosity mineralizators. The composition and process parameters were developed for obtaining facing ceramic materials based on anthropogenic raw materials.

Key words: mineralizer, aluminum production waste, viscosity, surface tension, water absorption

OBTAINING CATIONIC STARCHES BY SEMI DRY METHOD AND THEIR APPLICATION

The regularities of semi dry cationization of corn starch with the use of 3-chloro-2-hydroxypropyltrimethylammonium chloride and catalysts calcium oxide and/or sodium hydroxide were investigated. The possibility of application of the synthesized cationic starch samples as inter mass additive for the purpose of the water yield increase and strengthening ability increase in a dry condition of the test liner and fluting was shown.

Key words: cationic starch, substitution degree, semi-dry cationization, catalyst, test-liner, fluting

PURIFICATION OF POLLUTED SOIL WITH LOWER BOILING SOLVENT

The problems associated with the extraction of petroleum hydrocarbons containing in oil-polluted soils with low boiling solvent were considered.

Key words: polluted soil, purification, low boiling solvent

DISCRETE METHODS APPLICATION FOR FLUIDS FLOW SIMULATION

The application of Lattice Boltzmann Method as an alternative to a real physical experiment in the simulation of fluid motion is considered. The results of simulation allowing observing the formation of turbulent flows were given.

Key words: fluid simulation, cellular automata, lattice gas, Boltzmann method, cell, velocity channel, boundary conditions
CHARACTERISTIC FEATURES OF MATHEMATICAL MODELING HIGH-TEMPERATURE HEAT EXCHANGERS

The characteristic features of mathematical modeling heat exchangers at the conditions of high-temperature heat transfer are considered. It is specified that the distribution of heat transfer coefficient along the heat transfer area should be considered to avoid the temperature profiles distortion that leads to mistakes in mathematical modeling heat-exchanging equipment which is performed to optimize the operating procedure of such equipment as well as technical diagnostics.

Key words: high-temperature heat exchanger, heat carrier flow sheet, functional diagnostics, heat balance, mathematical model, heat

ESTIMATE OF DISPERSION KINETIC OF GRAPHITE ELECTRODE IN UNDERWATER FACE DISCHARGE

The kinetics of graphite electrode dispersion under the action of underwater face discharge on alternating current was studied as well as at the use it as a cathode. Cathode dispersion rate was found to be linear increasing with the growth of discharge current. At discharge actions on alternating current this dependence was non-linear, respectively. Cathode surface topography and size distribution of microroughnesses were also under the investigation. Their dependences on discharge current and treatment time were founded.

Key words: underwater discharge, dispersion, kinetic, erosion, microroughnesses

A QUESTION ON THE SIMULATION OF ADSORPTION MONOMOLECULAR LAYER

Produced theoretical study of the structure of the Langmuir adsorption layer on the basis of simple concepts of probability theory. It is shown that the Puasson distribution and normal distribution can be used as an approximation to the real distributions of particles in the adsorption of monomolecular layers

Key words: Langmuir’s adsorption model, Puasson's distribution, normal distribution

THERMAL ETHERIFICATION OF CARBOXYLIC AND SOME FRACTIONS OF OIL ACIDS BY 2-(PYPERIDINE-1-IL), 2-MORPHOLYNE ETHANOLS AND N,N-DIETHYLETHANOLAMINES

Possibility of obtaining the ethers with high enough yields of etherification of carboxylic and oil acids by 2-(pyperidine-1-il), 2-morpholine ethanols and N,N-diethylethanolamines in the absence of catalyst was established.

Key words: carboxylic acids, oil acids, 2-(piperidin-1-yl) ethanol, 2-morpholenoetanol, N,N-diethylethanolamin, thermal etherification, p-toluenesulfonic acid

SPATIAL STRUCTURE OF PARACETAMOL IN DMF-D6 BY 2D NOESY NMR SPECTROSCOPY

Spatial structure of N-(4-hydroxyphenyl) acetamide (paracetamol) was studied by two-dimension NOESY spectroscopy. Effective interproton distances for paracetamol in dimethylformamide were obtained. The most probable conformations of paracetamol in solution were determined by comparison with the results of quantum-mechanical calculations

Key words: two-dimensional NMR spectroscopy, 1H NMR spectroscopy, spatial structure, NMR conformational analysis, drugs design

EFFECT OF PLASMA-SOLUTION TREATMENT ON BACTERICIDAL AND ANTIFUNGAL PROPERTIES OF FLAX FIBER

Bactericidal and antifungal actions of gas discharge initiated in the volume of electrolyte solution on flax fiber placed into the solution were under study. The fiber after plasma-solution treatment and 30 day of storage has no bactericidal properties but showed the partial antifungal activity towards Candida albicans.

Key words: gas discharge, plasma-solution system, antifungal activity