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А Б С Т Р А К Т С

S.V. DUSHINA, V.A. SHARNIN

SOLVENT EFFECT ON STABILITY OF GROUP «B» VITAMINS COORDINATION COMPOUNDS

The generalization of the experimental data on the thermodynamics of the coordination equilibria of Ag^+ , Cu^{2+} , Fe^{3+} ions with nicotinate-ion, nicotinic acid and its amide in water and water-organic solvents was presented. The application of solvation-thermodynamic approach for description of a solvent role in the complex formation reactions showed the determinative role of solvation contribution of ligand and its donor center in stability changing complex compounds at replace of one solvent on another.

Key words: thermodynamics, complexation, stability constant, Gibbs energy transfer, solvation, nicotinamide, nicotinic acid

O.G. KARMANOVA, B.O. KOZ'MINYKH, P.P. MUKOVOZ, E.N. KOZ'MINYKH

SYNTHESIS AND STRUCTURAL VARIETY OF 1,6-DIALKYL-3,4-DIHYDROXY-2,4-HEXADIENE-1,6 DION

1,6-dialkyl-3,4-dihydroxy-2,4-hexadiene-1,6 diones were obtained with the condensation of alkylmethylketones with diethylalate in the presence of sodium methylate. The seven tautomeric forms were revealed with spectral methods. Annular-chain and annular-annular interconversions are discussed in the solutions of synthesized compounds.

Key words: alkylmethylketones, oxalyl condensation, 1,6-dialkyl-3,4-dihydroxy-2,4-hexadiene-1,6 diones, tautomeric forms

V.V. KONSHIN, A.A. ANDREEV, A.A. TURMASOVA, Dzh.N. KONSHINA

SYNTHESIS OF DIALKYNYSILANES

With the silylation of 1-alkynes by bis(amino)diorganosilanes and aminodimethyl(phenyle-thynyl)silanes in the presence of zinc chloride the dialkynylsilanes were obtained with the yield of 28 - 74%.

Key words: aminosilanes, 1-alkynes, alkynylsilanes, zinc chloride, silylation

A.Sh. RAMAZANOV, M.A. KASPAROVA, I.V. SARAeva, D.R. ATAev, M.B. ATAev

COMPOSITION, STRUCTURE AND PROPERTIES OF LITHIUM-ALUMINIUM CONCENTRATE ISOLATED FROM GEOTHERMAL MINERALIZED WATER

The chemical and phase composition of lithium-aluminum concentrate (LAC) isolated from a geothermal mineralized water was studied. The specific surface, porosity and pore size distribution in the concentrate were determined. The effect of heat treatment conditions on the composition, structure and properties of the LAC was established. The process flowsheet of LAC treatment was proposed. The flowsheet provides the lithium carbonate obtaining and return of aluminum compound on a step of sorbent synthesis.

Key words: lithium-aluminum concentrate, composition, geothermal mineralized water

M.V. ULITIN, D.V. FILIPPOV, A.A. MERKIN, O.V. ZAKHAROV, N.Yu. SHARONOV

LIQUID PHASE CATALYTIC HYDROGENATION KINETICS CONSIDERING SOLVENT PARALLEL DEHYDROGENATION

The possibility of the mathematical description of liquid phase catalytic hydrogenation in the closed system with parallel course of solvent dehydrogenation process was shown. The offered kinetic model was established to describe all basic regularities of 2-propanol parallel dehydrogenation in the liquid phase hydrogenations reactions of nitrobenzene, 4-nitroaniline, diethyl ether of maleic acid and acetoacetic ether on skeletal nickel in binary solvents 2-propanol-water.

Key words: liquid phase catalytic hydrogenation, dehydrogenation, solvent

L.G. ANIKANOVA, N.V. DVORETSKIY

STABILITY OF POTASSIUM-CESIUM FERRITE SYSTEMS DOPED WITH RARE-EARTH METALS

The method of the increase of (poly) ferrite stability to action of catalytic poisons based on the doping the potassium-cesium (poly) ferrites with the rare-earth metal oxides was offered. The doping the mixed potassium-cesium (poly) ferrites with scandium, yttrium, cerium and a samarium oxides leads to the reduction of mobility of ions of alkaline metals in inter block space of unit cell of β - phases.

Key words: potassium-cesium (poly) ferrite, doping, cation conductivity, catalyst, stability, catalytic poison

T.E. IVANOVA, A.V. ISMAGILOVA

CATALYTIC INFLUENCE OF THALLIUM ON ELECTRO-REDUCTION OF Cu (II) FROM NITRATE ELECTROLYTES

The thallium adatoms was established to act as catalyst at electro-reduction of copper ions from nitrate electrolytes. The nature of thallium enhancement influence depends on the electrode potential and electrolyte composition.

At potentials of copper deposition starting the thallium additions increase the rate constants of copper electro deposition and inhibit a side reaction of nitrate ions reduction in the range of limit currents.

Key words: thallium, copper, catalysis, electro deposition

Yu.V. POLENOV, E.V. EGOROVA, E.A. TUPITSINA
NICKEL CHEMICAL DEPOSITION ON CARBON FIBRE USING SODIUM HYDROXYMETHANESULFINATE

The possibility of sodium hydroxymethanesulfinate application for chemical method of obtaining the nickel cover on carbon fibre based on the viscose was studied. The choice of metallization conditions allowing to obtain the nickel cover without sulfur was carried out. The existence of Roentgen amorphous, non-homogeneous on thickness coating and its island character was established.

Key words: carbon fibre, metallization, sodium hydroxymethanesulfinate, X-ray patterns, ACM

V.A. KOZYRIN, V.N. FLEROV
INFLUENCE ZINCATE ON REVERSIBILITY OF DIFFERENT KINDS OF OKSIDNO-NICKEL ELECTRODES IN ALKALINES - ZINCATES ELECTROLITS

Considerable deterioration of reactive capacity of graphitize oxide-nickel electrodes (ONE) in zincate electrolyte is explained by catalytic formation of active cathodic zinc perhydrol, which is masking of active material parts, with less positive potential over graphite parts. This product generation leads to two-steps discharge curve of oxide-nickel electrodes. Graphitic components of oxide-nickel electrode limitations have been overcome by using metal powder oxide-nickel electrodes, they was not poisoned by zincate, because they had difficulties of zinc perhydrol intermediate formation.

Key words: zinc peroxide, air-depolarized electrode, oxidation -nickel electrode, alkaline-zincate solution, nickel- zinc accumulator

G.I. MALTSEV, V.V. ROMANOVA
EXTRACTION KINETICS OF ARSENIT-IONES WITH ALKYLAMINES

Limiting stages of extraction process of arsenit-ions with the surface-active alkylamines from sulphatic solutions of various concentrations were revealed. Recommendations on intensification of process of clearing of technological solutions from an arsenic impurity were made.

Key words: extraction, arsenit-iones, alkylamines, sulphatic solutions

D.A. MUKSINOVA, V.Yu. GUSEV, A.V. RADUSHEV
COPPER (II) EXTRACTION WITH N',N'-DIISOBUTYL *para*-TERTBUTYLBENZOHYDRAZIDE

A new reagent - N',N'-diisobutyl *para*-tertbutylbenzohydrazide – was synthesized. Copper (II) extraction with this reagent in the range of pH 6-9.5 is equal to 98-99 %. The extraction isotherm was plotted and extraction constant of copper (II) from ammonia medium was calculated. The branch of N',N'-alkyl radicals was established to result in the sharply decrease of extraction ability towards copper (II) in comparison with hydrazides with unbranched N',N'-alkyl radicals.

Key words: N',N'-diisobutyl *para*-tertbutylbenzohydrazide, extraction, copper(II)

I.K. GARKUSHIN, M.A. RADZIKHOVSKAYA, E.G. DANILUSHKINA
STUDY OF QUTERNARY SYSTEM KF-KBr-K₂WO₄-K₂MoO₄

The quaternary system KF-KBr-K₂WO₄-K₂MoO₄ was investigated by the method of differential thermal analysis (DTA). The fields of crystallization volumes of the system's components were determined. The phase transformations were described.

Key words: differential thermal analysis, quaternary system, non-variant equilibrium point, mono-variant equilibrium line, permanent set of solid solution, crystallization volume

S.V. SILKIN
KINETIC OF SPUTTERING OF GRAPHITE ANODE IN UNDERWATER FACE DISCHARGE

The kinetic of graphite anode sputtering under the action of underwater discharge on pulsed current in the range of 0.6-100 mA was study. Sputtering rates of anode material were found to be in direct proportion to discharge current. The sputtering coefficient was estimated to be one atom of carbon per one ion passing the system. The distribution of disperse particles on sizes was studied. It was shown that the discharge current increase results in the decrease in the size of disperse particles.

Key words: underwater discharge, dispersing, kinetic, particles size distribution

S.M. BARINOV, V.I. SVETTSOV, A.M. EFREMOV
SPECTRAL INVESTIGATION OF GLOW DISCHARGE IN METHANE AND IN ITS MIXTURES WITH ARGON

The emission spectra of 50% CH₄ + 50% Ar DC glow discharge plasma were investigated. The main emission bands and lines were identified. It was proposed that the CH 431 nm emission band results from the dissociative excitation of CH₄ while both H atomic lines and H₂ bands appear due to the direct electron impact excitation of corresponding ground-state neutral species.

Key words: methane, emission spectra, plasma

A. V. ZAKHAROV, G. A. ZHURKO, E. G. GIRICHEV, Yu. A. ZHABANOV, G. V. GIRICHEV
METHODS FOR PROCESSING ELECTRON DIFFRACTION DATA AND THEIR SOFTWARE
IMPLEMENTATIONS. PART I. INITIAL DATA PROCESSING

The present work is dedicated to procedures of processing electron diffraction data used in the Laboratory of molecular parameters of the Department of Physics at ISUCT. It reports techniques, equipment and software for initial data processing (photometering and scanning). Methods of isolating molecular component of the scattering intensity are described.

Key words: gas-phase electron diffraction, data reduction, microdensitometer, scanner

A. V. ZAKHAROV, G. A. ZHURKO, G. V. GIRICHEV
METHODS FOR PROCESSING ELECTRON DIFFRACTION DATA AND THEIR SOFTWARE
IMPLEMENTATIONS. PART II. CALCULATION OF ROOT-MEAN-SQUARE AMPLITUDES OF
VIBRATIONS AND VIBRATIONAL CORRECTIONS TO INTERNUCLEAR DISTANCES. LEAST-SQUARES
ANALYSIS

The present work is dedicated to procedures of processing electron diffraction data used in the Laboratory of molecular parameters of the Department of Physics at ISUCT. Methods of computing vibration corrections used in electron diffraction and corresponding software are described. The information on software for least-squares analysis of electron diffraction data is presented.

Key words: gas-phase electron diffraction, vibration corrections, r.m.s. amplitudes, least-squares analysis

Ya. O. MEZHUEV, Yu. V. KORSHAK, M. I. SHTILMAN, A. I. PISKAREVA, I. V. SOLOVYOVA
INFLUENCE OF POLY(N-VINYLPYRROLIDONE) CONCENTRATION ON RATE OF OXIDATIVE
POLYMERIZATION OF PYRROLE IN AQUEOUS SOLUTION

The kinetics of oxidative polymerization of pyrrole in an aqueous solution with poly(N-vinylpyrrolidone) was studied. It was shown that autocatalysis takes place. The influence of poly(N-vinylpyrrolidone) concentration on the rate of oxidative polymerization of pyrrole in an aqueous solution was discovered and explained.

Key words: pyrrole, poly(N-vinylpyrrolidone), polymerization

O. V. ZAKHAROV, M. V. ULITIN, M. P. NEMTSEVA, I. K. OSIPOV, A. A. KOMAROV
REACTION KINETICS OF 4-NITROTOLUENE HYDROGENATION ON SKELETAL NICKEL IN 2-PROPA-
NOL AQUEOUS SOLUTIONS. II. RATE CONSTANTS AND ACTIVATION ENERGY OF REACTION
AT DIFFERENT HYDROGEN PRESSURES

The kinetic parameters of 4-nitrotoluene hydrogenation reaction on skeletal nickel catalyst in binary solvents 2-propanol-water were determined. The internal mass transfer steps were shown to influence essentially on the observed reaction rates. The action of binary solvent composition and hydrogen pressure on rates and rate constants of 4-nitrotoluene hydrogenation on the catalyst equally accessible surface was connected with the peculiarities of hydrogen adsorption interactions with the surface active sites of skeletal nickel.

Key words: 4-nitrotoluene, skeletal nickel catalyst, hydrogen pressure, hydrogenation

Z. M. ARABOVA, Yu. M. DEDKOV, N. V. KORSKOVA
RHODIUM (III) LABIALIZATION IN PROCESSES OF COLOUR REACTION CARRYING OUT

The optimal ways of rhodium (III) labialization at its determination by means of heterocyclic azocompounds were discussed. In the case under consideration the rhodium (III) labialization achieves by the decrease of its oxidation degree. The carbonyl chlorides were studied as possible labile compounds. The availability of mild carbonylation of rhodium (III) was shown using acetate-alcohol systems. The further its interaction with heterocyclic azocompounds was described.

Key words: rhodium, labialization, rhodium carbonyl halogenation, acetate-alcohols media

M. S. PARFYENOVA, Yu. T. PANOV, E. V. ERMOLAEVA, V. T. ZEMSKOVA
ANALYTICAL METHOD FOR DETERMINING OPTIMAL TECHNOLOGICAL PARAMETERS OF
CARBIDIZATION USING GENETIC ALGORITHM

An analytical method for determining the optimal process parameters of carbidization products in the form of a rectangular parallelepiped, a cylinder and a hollow axial symmetric truncated cone. In contrast to previously developed graph-analytical method the proposed algorithm automates the search process of technological parameters and to avoid the construction of nomograms at each new relationship.

Key words: foam carbides, carbidization, mathematical model, rate of heating, temperature gradient, gradient of the content of titanium carbide

O. G. KHELEVINA
CURING OF LIQUID OLIGODIMETHYLSILOXANDIOLS BY METHYLTRIACTOXYLSILANE

Curing kinetics of liquid oligodimethylsiloxanediols with the methyltriacetoxysilane is described with the kinetic equation of the first order for irreversible reactions. The first order is observed on methyltriacetoxysilane at the change of its concentration on composition from 1 to 6 weight %. The effective rate constants of vulcanization and values of activation energy were calculated at 25-55 °C. Considerations on curing mechanism of oligodimethylsiloxanediols were delivered.

Key words: curing, oligodimethylsiloxanediols, methyltriacetoxysilane

V.I. BESSHAPOSHNIKOVA

FIRE PROTECTIVE MODIFICATION OF POLYACRYLONITRILE FIBER MATERIALS

The technology of fire-resistant modification of (poly) acrylonitrile fibers with phosphorus-containing fire retarders under the action of laser radiation was developed. Effect of modifying on the processes of the pyrolysis and combustion, physical-mechanical and operating properties of fire-resistant polyacrylonitrile fibers and textile materials were studied. Oxygen index is increased to 27-29.5%.

Key words: technology, fire-resistant modification, (poly) acrylonitrile fiber, phosphorus-containing fire retarder, laser radiation

N.N. OSIPOV, M.V. KLYUEV, A.A. RAZUMOV, A.G. NAUMOV, K.V. SKVORTSOV, K.S. KHOR'KOV

CHEMICAL MODIFICATION OF CARBON NANOTUBES

The modification of carbon nano tubes with various functional groups was carried out. The obtained materials were characterized with the complex of physical-chemical methods of analysis and it was used as additives for metalworking fluids at drilling. The use as additives dodecylamine-modified carbon nano tubes were shown to result in the torsion torque reduce of drill by 35-40%.

Key words: carbon nanotubes, chemical modification

P.V. MISHTA, G.I. LEPYOKHIN, A.P. SEMERNYA, E.A. BEDNARSKAYA

EVAPORATION OF THIN FUEL FILM AT CONDITIONS OF INTENSIVE HEAT SINK FROM GAS SIDE

Dependence for determination of surface temperature of fuel film from the side of air flow was obtained for calculation of evaporation process which is carried out in the thermal phenomena of modern diesel engines.

Key words: fuel film, evaporation, mass exchange, film device

O.A. SEMENOV, A.N. LABUTIN, D.V. TARAKANOV

ALGORITHMS OF DECISION-MAKING AT SUPPRESSION OF FIRES ON OBJECTS OF CHEMICAL INDUSTRY

In article the algorithms of detection of information on relative importance of the criteria necessary for decision-making on alignment of forces and means at suppression of fires on objects of the chemical industry were offered.

Key words: decision-making, fires suppression, algorithms of formalization of operational and tactical information

O.M. BALASHOVA, O.A. BRAGAZINA, G.M. KURDYUMOV

POLYVARIANT EXPRESS TESTING AT LECTURES ON GENERAL CHEMISTRY

The poly variant express testing based upon the results of the comparative analysis of various ways of the lectures material knowledge with the constructible answers was proposed. Technique of testing was described. Detailed recommendations to organize polyvariant express testing during lectures and examples of tasks on general chemistry are given.

Key words: polyvariant express testing, designed answers, alternative answers