

A B S T R A C T S

D.O. STEPANETS, V.A. VOLYNKIN, F.A. KOLOKOLOV, V.T. PANYUSHKIN, I.E. MIKHAYLOV, G.A. DUSHENKO

SYNTHESIS AND PHOTO LUMINESCENCE PROPERTIES OF RARE-EARTH COMPLEXES WITH [(2-METHYL QUINOLINE-8-YL) OXY]-ACETIC ACID

Complex compounds of [(2-methyl quinoline-8-yl) oxy]-acetic acid (HL) with the europium (III) and the terbium (III) of $\text{LnL}_3 \cdot 2\text{H}_2\text{O}$ composition have been obtained. On the base of IR spectra analysis the coordination of lanthanide ion with carboxylic group and nitrogen atom of quinoline ring of ligand has been established to occur. Photo luminescence properties of compounds obtained have been studied. In complex compound of europium (III) the energy transfer from ligand to metal ion has been shown to be more effective than in complex of terbium (III). An environment of lanthanide ion in europium (III) complex has the symmetry not higher than C_{2v} .

Key words: complex compounds, [(2-methyl quinoline-8-yl) oxy]-acetic acid, europium, terbium, photo luminescence properties

V.Yu. KUROCHKIN, V.V. CHERNIKOV, A.I. LYTKIN

COMPLEXATION OF L-ASPARAGINE, DL-GLUTAMINE WITH CALCIUM ION IN AQUEOUS SOLUTION

The complexation of L-asparagine and L-glutamine with the calcium ion was studied in aqueous solution at 298.15 K and several ionic forces ($I = 0.5; 1.0; 1.5 \text{ KNO}_3$) using potentiometric method. It was shown the complexes CaL^+ and CaHL^{2+} are formed. Stability constants of complex compounds were determined. The values of thermodynamic stability constants of complex compounds were calculated.

Key words: thermodynamics, asparagine, glutamine, calcium ion, complexation constant

D.A. KAZAKOV, A.V. PORTNOVA, S.A. ONORIN

STUDY OF TITANIUM TETRA-*n*-BUTOXIDE HYDROLYSIS IN WATER-ALCOHOL MEDIUM

Experimental study results of titanium tetra-*n*-butoxide hydrolysis in water-butanol medium are presented. A possibility of TiO_2 precursor characteristics control by means of hydrolysis conditions variation was shown. A process mechanism of TiO_2 precursor precipitate formation was proposed.

Key words: titanium tetra-*n*-butoxide, hydrolysis, water-alcohol solution, titanium dioxide, precursor

U.A. GASANOVA

METALLATION OF SALTS OF MONO- AND DICARBOXYLIC ACIDS BY ALKALINE METAL COMPLEXES WITH CROWN ESTERS

The metallation of sodium and potassium salts of organic acids in which the α -hydrogen is undergone with the strong mesomer action of carboxylate anion has been studied. The reaction has been carried out with the polyhomometal nano anions which are formed under dissolution of alkaline metals in the presence of crown esters.

Key words: metallation, crown ester complexes, polyhomometal nano anion, carboxylation.

V.S. PISAREVA, A.A. GOLOVANOV, M.I. PLESHCHEV, I.A. GRACHEVA

WATER INFLUENCE ON INTERACTION SELECTIVITY OF *tert*- BUTANOL WITH C_2 - C_4 ALCOHOLS IN SULFOCATIONITE PRESENCE

The results of study of water influence on a synthesis selectivity of alkyl-*tert*-butyl esters from *tert*-butanol and primary C_2 - C_4 alcohols in the presence of gel and macro porous cation(-exchange) resins are given. The increase in hydration degree of cationite has been shown to result in the decrease of synthesis selectivity of alkyl-*tert*-butyl ester. The action effect has been marked to enhance in alcohol series C_2 - C_4 which are inputted in reaction with *tert*-butanol and under the gel cation (-exchange) resin replacing on macro porous one.

Key words: ion-exchange resin, *tert*-butanol, ester, isobutene, carbocation, etherification, dehydration, selectivity, C_2 - C_4 alcohols.

*O.N. KORABLEVA, B.N. BYCHKOV, E.I. FILIMONOVA, O.S. PAVLOV,
L.M. SOBOLEVA, V.V. SOLOVIEV*

**STUDY OF PHENOL ALKYLATION WITH PROPENE TRIMERS
ON AMBERLIST- 36 DRY CATALYST**

The conditions of alkylation reaction accomplishing on the catalyst Amberlist 36 dry are presented. The obtained mono alkyl phenol has been shown to be the para-isomer.

Key words: alkylation, catalyst, phenol, propylene trimer

A.Yu. ADZHIEV, N.I. DOLINSKAYA, V.V. MEL'CHIN, N.V. BARKOVSKY, T.A. STROGANOVA

**DETERMINATION OF SO₃ CONTENT FORMING IN PROCESS OF AFTER-BURNING
OF WASTE GASES FROM CLAUS DEVICE**

The problems of SO₃ micro amount determination in the presence of SO₂ in products of H₂S catalytic oxidation containing in exhaust gases of Claus process have been considered. A critical analysis of known chemical methods for SO₃ determining in the presence of SO₂ has been made. A method of precipitating titration after absorption of the gas mixture by 80% solution of propanol-2 (titrant - Ba(ClO₄)₂, the indicator - thoron) has been chosen for further investigations. The tests of the domestic catalysts have been carried out at a temperature of 300-450 °C which show the increase in SO₃ content in gaseous mixture under the temperature increase.

Key words: waste gas, after-burning, catalyst, sulphur trioxide, titration, sulphur dioxide

S.N. SHYKOV, T.D. SMIRNOVA, N.V. NEVRYUEVA, I.V. BOGOMOLOVA

**COMPLEXES WITH ENERGY TRANSFER IN ORGANIZED MEDIA
FOR DETERMINATION OF FLUMEQUINE IN BIOLOGICAL OBJECTS**

The influence of micro emulsion media on fluorescence properties of Tb³⁺ chelate with flumequine has been studied. The fluorescence intensity of Tb³⁺ chelate with flumequine has been shown to rise by a factor of 4.4, and in micro emulsion by a factor of 6. Fluorometric methods of flumequine determination using micelle solutions of surfactants and micro emulsion media have been developed. The determination limit is 6.2·10⁻⁹M and 4.2·10⁻⁹M, respectively. The determination error is not more than 0.01. Methods have been used for flumequine determination in hen's meat.

Key words: flumequine, determination, terbium sensibilized fluorescence, second ligand, micro emulsion

E.A. DANILOVA, L.N. OLSHANSKAYA, E.K. LIPATOVA, A.A. KIRCHEVA

**OPERATION PECULARITIES OF SOLID STATE Cd-SELECTIVE ELECTRODES
AT ANALYSIS OF SEWAGE**

Kinetic dependences of solid-state Cd-selective electrodes in a wide range of concentrations of model solutions have been considered at various temperatures. The influence of composition and technological conditions of electrode preparation on stability and convertibility of its operation has been studied.

Key words: ion- selective electrodes, concentrations, model solutions, electrodes composition, operation stability, operation convertibility.

L.M. MALUKA, T.V. GUZIK

INDIRECT REDOX POTENTIOMETRIC DETERMINATION OF CERIUM (IV)

The redox-potentiometric method of determination of cerium (IV) ions on the base of the reaction with iodide - ions in the water-ethanol solutions has been developed.

Key words: potentiometry, cerium, magnesium alloy, iodide-metric method, platinum electrode, calibrating dependence, water-ethanol solution

N.A. SOBGAYDA, L.N. OLSHANSKIY, Yu.A. MAKAROVA

**INFLUENCE OF MODIFYING WHEAT HUSK ON ITS SORPTION PROPERTIES
TO Pb²⁺, Cd²⁺, Zn²⁺ AND Cu²⁺ IONS**

In article the sorption properties of sorbents on the base of modified husk of wheat have been studied. Kinetic parameters and sorption isotherms of sorbents are presented. The influence of medium pH on a purification degree of waste waters from heavy metal ions has been studied.

Key words: ions of heavy metals, sewage treatment, sorption

I.V. SMIRNOVA, M.P. NEMTSEVA, O.V. LEFEDOVA
**HYDROGENATION OF SUBSTITUTED NITROBENZENES IN 2-PROPANOL-WATER
MEDIUM IN PRESENT OF ACIDS AND BASISES**

The dependence of liquid-phase hydrogenation rate of isomers of nitrobenzoic acid and nitrophenol on the nature of addition and on the place of substitute in initial substance was studied. An introduction into 2-propanol-water solvent both base and acid decreases a reaction rate. For nitrophenols for all used solvents and for nitrobenzoic acids in alkaline medium a rate has been shown to increase in series p-isomer < m-isomer < o-isomer whereas for nitrobenzoic acids in neutral and acid media to increase in series m-isomer < p-isomer < o-isomer.

Key words: adsorption, hydrogenation, substituted nitrobenzenes, solubility, electronic density

S.V. LANOVETSKIY, V.Z. POIYLOV, A.M. SIZYAKINA, A.V. STEPANOV
**INFLUENCE OF COOLING RATE AND MIXING INTENSITY ON MASS CRYSTALLIZATION
PROCESS OF MANGANESE ACETATE TETRAHYDRATE**

The study of process of mass crystallization of manganese acetate tetrahydrate from saturated solution has been carried out. The influence of cooling rate of manganese acetate solution on a product yield and quality has been studied. The dependence of crystal size and their form on a solution mixing rate during a process of poly thermal crystallization has been established. Equations adequate describing revealed kinetics regularities have been obtained.

Key words: manganese acetate, mass crystallization, crystallization degree, solution cooling rate

S.V. LANOVETSKIY, V.Z. POIYLOV, O.K. KOSVINTSEV
**INFLUENCE OF TEMPERATURE, MIXING INTENSITY AND SOLUBLE ADMIXTURES
ON CRYSTALLIZATION PROCESS OF MAGNESIUM NITRATE
FROM OVERSATURATED SOLUTION**

Influence studies of mixing, temperature and soluble admixtures on stability of magnesium nitrate oversaturated solutions have been carried out. The solution mixing rate increase, the crystallization temperature increase and the existence in solution of potassium, calcium and chlorine ions have been established to result in the decrease in a solution overcooling. Equations adequate describing regularities revealed have been obtained.

Key words: magnesium nitrate, crystallization, oversaturation, solution stability

V.M. NOVOTORTSEV, G.G. SHABUNINA, T.G. AMINOV, D.I. KIRDYANKIN
SOLID SOLUTIONS (Cu_{0.5}Fe_{0.5})_{1-x}Zn_xCr₂S₄: SYNTHESIS AND MAGNETIC PROPERTIES

The conditions of synthesis and border of the homogeneity of semiconducting solid solutions (Cu_{0.5}Fe_{0.5})_{1-x}Zn_xCr₂S₄ on the base of high temperature ferrimagnet Cu_{0.5}Fe_{0.5}Cr₂S₄ and antiferromagnet ZnCr₂S₄ have been studied. Magnetic properties of samples under investigation in a wide range of fields (50 - 40000 Oe) and temperatures (5 - 300 K) have been measured. It has been established that that properties connect strongly with the composition and crystallographic peculiarities of the compounds obtained.

Key words: chalcogenide spinel, spin glass

I.V. MARDIROSOVA, M.A. SAVENKOVA, N.P. VASSEL, S.S. VASSEL
**MELTING DIAGRAM OF SYSTEM ON BASE OF META PHOSPHATES OF BISMUTH
AND MANGANESE**

The melting diagram of the Bi(PO₃)₃ – Mn(PO₃)₂ system has been investigated by a set of physical-chemical analysis methods. The new compound formation Mn₃Bi₂(PO₃)₁₂ has been established at the components ratio of 1:1. The compound melts on a peritectic schema at 860° C. Some physical-chemical constants have been determined for a new selected phase.

Key words: melting diagram, Bi(PO₃)₃ – Mn(PO₃)₂, peritectic, chemical compound

L.I. MAKAROVA, E.A. MEZINA, I.M. LIPATOVA
HYDROACOUSTIC DISPERSION OF FATTY ACIDS IN CHITOSAN SOLUTION

The effect of hydroacoustic action realized in rotor-impulse apparatus on a particles size of disperse phase and reological properties of fatty acids dispersions in chitosan solutions has been investigated using the oleic and stearic acid as an example.

Key words: hydroacoustic action, dispersion, fatty acids, chitosan

Z.R. AGAEVA

INVESTIGATION OF SURFACE – ACTIVE PROPERTIES OF NITRATION PRODUCTS OF M-11 OIL AND TECHNICAL ALKYL-(R=C₈ – C₁₂) PHENOL

The surface-active properties of substances obtained by means of nitration of M-11 mineral oil and technical alkyl (R=C₈ – C₁₂) phenol. Compounds under study have been established to reduce the surface tension on the boarder liquid – liquid. At the same time the synthesized compounds are able influence positively on the processes of asphalt-resin-paraffin depositions.

Key words: surfactants, adsorption, oil and gas mining, emulsion, surface tension

I.R. MIRGALIEVA, E.A. GLUKHOV, I.A. IONOVA, A.G. MUSTAFIN, Yu.B. MONAKOV

INFLUENCE OF BUTADIENE POLYMERIZATION TEMPERATURE AND CATALYST EXPOSITION ON VARIOUS ACTIVE SITES OF TITANIUM CATALYTIC SYSTEM

The influence of the polymerization temperature and catalyst exposition on molecular characteristics of poly butadiene and kinetic heterogeneity of catalytic system based on TiCl₄ with AlCl(i-C₄H₉)₂ has been studied. Separate types of active sites have been shown to manifest the different temperature stability.

Key words: poly butadiene, different active sites, Ziegler-Natta catalysts.

V.Yu. KUROCHKIN, V.V. CHERNIKOV, A.I. LYTKIN

COMPLEXATION OF L-HISTIDINE, DL-PHENYLALANINE WITH CALCIUM ION IN AQUEOUS SOLUTION

The complexation of L-histidine and DL-phenylalanine with the calcium ion was studied in aqueous solution at 298.15 K and different ionic forces (I = 0.5; 1.0; 1.5, KNO₃) using potentiometric method. It was shown the complexes CaL⁺ and CaHL²⁺ are formed. Stability constants of complex compounds were determined. The values of thermodynamic stability constants of complex compounds were calculated.

Key words: complexation, calcium ion, stability constant, amino acid.

N.M. MAXIMOV, N.N. TOMINA, A.A. PIMERZIN

SULPHIDE CATALYST ACTIVITY ON BASE OF SOME TWELVE- FAMILY MOLYBDENUM HETEROPOLYACIDS IN DIESEL FRACTION HYDRO PURIFICATION

The catalytic activity of Co-Mo(S)/γ-Al₂O₃ sulfide catalysts has been studied in process of hydro purification. Twelve- family molybdenum heteropolyacids (HPA) with central hetero atoms of Si, P, V, Sn have been used as precursors of active phase. Catalysts have been synthesized by the method of wetness impregnation of γ-Al₂O₃. A catalytic activity has been estimated by means of hydrodesulphurization degree (HDS) and hydrogenation degree (HDA) of poly aromatic hydrocarbons forming part of diesel fractions.

Key words: hydro purification, sulfide catalysts, hetero poly acids

D.N. LAPSHIN, A.V. KUNIN, S. A. SMIRNOV, A. P. ILYIN

INVESTIGATION OF PROPERTIES OF HYDROPHOBISIZED PHOSPHATE OF MONOAMMONIUM

The article deals with the study of process of obtaining the fire extinguishing powder composition on the base of the synthesized phosphate of mono ammonium. The effect of inert additives and hydrophobic additives on the properties of fire extinguishing compositions has been shown. An optimal size of ammonium sulfate fraction which is necessary to produce a fire extinguishing compositions with the best operating properties has been chosen. The fire extinguishing powder composition which satisfies to the standards of fire safety has been obtained.

Key words: phosphate of mono ammonium, hydrophobization, fire extinguishing powder composition, ammonium sulphate

N.V. LESHCHEV, V.Yu. PROKOFIEV, N.E. GORDINA

INVESTIGATION OF PROCESS OF MECHANOCHEMICAL SYNTHESIS OF SODIUM ALUMINATE IN MILL WITH AN IMPACT-SHEAR BEHAVIOR OF LOADING

The influence of mechanical activation of alumina and sodium hydroxide mixture on the synthesis of sodium aluminate has been studied. A topochemical model describing the process of aluminates synthesis has been chosen. The rate constant of a mechanochemical synthesis has been determined. The influence of heat treatment on the formation of sodium aluminate has been studied.

Key words: aluminum oxide, sodium hydroxide, sodium aluminates, mechano-chemical synthesis, impact-shear action, mill

*O.V. BOGUSLAVSKAYA, M.V. KULIKOV, N.S. MINEEVA, B.S. TUROV,
A.S. DANILOVA, T.A. KULIKOVA*
**FILM-FORMING AGENTS ON BASE OF LOW-MOLECULAR EPOXYDIZED
BUTADIENE-STYRENE COPOLYMERS**

The curing of low-molecular epoxydized butadiene-styrene copolymers on double bounds in the presence of hardeners has been investigated. The influence of modification degree of epoxydized copolymers on an yield of gel-polymer and physical-mechanical properties of coverings on their base has been shown.

Key words: butadiene-styrene copolymers, epoxidation, hardening, gel-polymer

A.E. ZAVADSKIY
**PECULIARITIES OF KINETICS OF CELLULOSE STRUCTURAL MODIFICATION UNDER
HYDROPHOBIC FABRICS TREATMENT WITH SILUTIONS OF SODIUM HYDROXIDE**

By methods of x-ray diffraction analysis and scanning electron microscopy it has been proved that for efficient mercerization of raw cotton materials it is enough to create conditions under of which a full contact of the fibers surface with sodium hydroxide solution is provided. A presence even small amount of air in inter fiber spaces reduces sharply a quality of the processing.

Key words: X-ray analysis, cotton fibre, treatment, sodium hydroxide

K.V. BRYANKIN, A.I. LEONTIEVA, A.A. DEGTYAREV
**APPROACHES TO CLASSIFICATION CREATION OF ORGANIC DYES SEMI-PRODUCTS
ACCORDING TO THERMAL STABILITY**

The work is devoted to the questions of thermal stability of organic dyes semi-products (ODSP) in de-hydration process. The most widespread OPSP of the following groups have been examined: arylides, derivatives of pyrazolone, naphthalene, benzene, toluene and anthraquinone. The classification has been developed and the levels of thermal stability of ODSP groups mentioned above in drying have been determined on the base of their chemical structure analysis, derivatographic research results, and taking into account the specific features of heat and mass transfer processes.

Key words: thermal stability, organic dye, drying, derivatography

V.N. NEKRASOVA, T.L. SHCHEGLOVA, O.A. BELOKUROVA
LOW-CONCENTRATED VISCOUS SYSTEMS FOR THICKENING PRINTED PAINTS

Regularities of formation of the porous and gel-like structures of the viscous systems on the base of cellulose carboxymethyl ester and starch have been studied. The optimization of concentration of alumina-alkaline stabilizer in a thickener composition has been carried out. The estimation of influence of thickener components on complexation fullness has been accomplished. The sodium stearate optimal concentration in thickener composition has been determined on the base of multiplicity and porous structure stability. Changes of viscosity and multiplicity of porous thickening have been studied depending on surrounding temperature and temperature of introduced solution of sodium stearate.

Key words: thickener, carboxymethyl of cellulose, starch carboxymethyl, stabilizer, multiplicity, porous system, gel-like composition

V.I. CHURSIN
PROPERTIES OF TITANIUM TANNING SOLUTIONS

The action of titanium tanning concentration on the pH value and electric conductivity of solutions has been investigated. The influence of organic acids on the tanning hydrolysis kinetics has been shown.

Key words: titanium tanning, hydrolysis, electric conductivity, organic acids

V.I. VERESHCHAGIN, A.D. SHILTSINA, Yu. V. SELIVANOV, N.N. KOROLKOVA
**CHOICE OF COMPONENTS OF CERAMIC MASS TAKING INTO ACCOUNT
CHEMICAL COMPOSITION**

Under the absence and small content of melting in the temperature range of ceramic burning the ceramic strength has been shown to be larger than higher the difference of values of basicity moduluses of ceramic mass components. Under the presence of flux in masses the manifestation of difference of basicity modulus values of components is rise manifold.

Key words: melting, ceramic, strength, basicity

M.P. TSYGANKOV, D.S. KRUCHININ

MODEL OF FUNCTIONAL DIAGNOSTICS OF HIGH - TEMPERATURE HEAT EXCHANGERS

The problems of diagnostics of heat exchanger equipments under conditions of normal operating are considered. The model of heat exchanger having cross – counterflow scheme of heat carrier movement intended for its technical state monitoring on data of automatized control of technological condition is given.

Key words: heat exchanger, normal operating, model, monitoring, technical state

N.Ch. MOVSUM-ZADE

COMPLEXSATION OF SUBSTITUTED ACETONITRILES

Synthesizes of substituted acetonitriles have been considered. Synthesizes of acetonitrile complexes with salts of metals of transition valency have been presented. Also, complexes of the same salts with substituted acetonitriles have been shown.

Key words: complexes, acetonitrile, transition valency metals

V.I. KORCHAGIN, A.V. PROTASOV, M.V. KORCHAGIN, I.V. KUZNETSOVA

THERMOSTABILITY OF SOOT-FILLED BUTADIENE-STEROL RUBBER AT DRYING WITH APPLICATION OF SECONDARY POWER RESOURCES

During the drying of butadiene-sterol rubbers using the smoke emission the probability decrease of thermo-oxidative processes in polymer phase of rubber is achieved. Also, it provides the energy conservation and elimination of negative action of smoke emission on environment.

Key words: rubber, soot, filler, drying, energy conservation

T.V. SMYSHLYAEVA, I.A. BORISOVA, M.F. TORSUNOV, R.M. KHAFIZOVA

NANOPOROUS CARBON POWDERS FROM COMPOSITIONS OF PHENOL-FORMALDEHYDE RESIN-HYDROCARBONS

Nanoporous carbon powders with BET specific surface area of 2000 m²/g have been obtained by pyrolysis of mixtures of phenol-formaldehyde resin and saccharose or cellulose with the subsequent activation. The samples structure has been studied by microscopy, X-ray analysis and the low temperature nitrogen sorption. The picnometric density and electrical resistance of these powders have been measured. The maximal values of electrical resistance and BET specific surface of carbonaceous samples have been shown to achieve at volume concentration of additions equal to a threshold of percolation. The correlation between the physical properties change and specific surface of carbon powders at activation has been established.

Key words: nano-porous carbon, powders, phenol-formaldehyde resin, specific surface, electrical resistance

M.Yu. TARSHIS, A.V. DUBROVIN, A.I. ZAITSEV

MODELING PROCESS OF LAYERWISE MIXING BULK MATERIAL

Hot bitumen and mineral powder mixture obtaining is one of the determinative stage of preparation of bitumen-concrete mixture. In this paper the variation coefficient of bitumen particles concentration in mixture has been used as assessment criterion of mixing process. The best parameters and types of feeding equipments from viewpoint of mixing efficiency have been determined.

Key words: mixing, concentration, feeding equipments, probability of distribution

V.P. ZHUKOV, A.N. BELYAKOV

MODELING AND CALCULATION OF COMBINED PROCESSES ON BASIS OF BOLTZMANN EQUATION

A generalized description of combined processes of transportation, grinding, classification, and mixing of granular materials based on the Boltzmann equation is proposed. The approach to its numerical solution for multi-dimensional systems is developed with the use of mathematical tool of the Markov chains theory. Results of numerical solution for some practical problems are presented.

Key words: Boltzmann equation, grinding, classification, mixing, transport, granular material, transition probabilities matrix