

А B S T R A C T S

N.F. KOSENKO

ALUMINA MATERIALS SINTERING

Information on the alumina materials sintering published in recent years is given and systematized. The sintering mechanism in a pure oxide and in the presence of additives has been analyzed. The influence of a mechanical activation and other factors has been considered. The alumina sintering kinetics has been characterized.

Key words: alumina, corundum, sintering, mechanical activation

N.N. VERDIEV, P.A. ARBUKHANOVA, Z.N. VERDIEVA, E.G. ISKENDEROV, M.M. RADZHABOVA
EXCHANGE REACTIONS IN TETRA COMPONENT MUTUAL SALT SYSTEM WITH DOUBLE SALTS

The method of revealing the chemical interaction in tetra components mutual system with cyclic forms of phase trees has been proposed. Chemical reaction equations formed with offered method which correspond to the Na, K, Ca // F, MoO₄ system have been given.

Key words: phases tree, chemical compounds, chemical reaction, eutectic, exchange reactions, phase reactions, tetra components mutual systems, double salts

A.N. SOKOLOV, V.M. CHERNYSHEV, M.V. MISHCHENKO, V.A. TARANUSHICH
SYNTHESIS OF OCTOHYDRO [1, 2, 4] TRIAZOLO [1, 5-a:4, 3-a']DIPYRIMIDINIUM CHLORIDES

The method for the synthesis of octohydro[1,2,4]triazolo[1,5-a:4,3-a']dipyrimidinium chlorides from 2-amino-4,5,6,7-tetrahydro-[1,2,4]triazolo[1,5-a]pyrimidines and 3-chloropropanoyl chloride has been proposed.

Key words: [1, 2, 4]triazolo[1, 5-a]pyrimidine, cyclization, polycondensed heterocycles

S.M. DANOV, A.V. SULIMOV, T.A. RYABOVA, A.A. OVCHAROV, A.V. SULIMOVA
STUDY OF OLEFINS EPOXIDATION PROCESS IN PRESENCE OF VARIOUS SOLVENTS

An influence of solvent nature on the process of liquid phase epoxidation of olefins by aqueous solution of hydrogen peroxide on the titanium-containing zeolite has been studied. Butanol-1, butanol-2, propanol-1, isopropanol, methanol, ethanol, water, acetone, methylethyl ketone, isobutanol, acetonitrile have been investigated as solvents.

Key words: epoxidation, titanium-containing zeolite, propylene oxide, epichlorhydrin, glycidol

S.Yu. ZAIYTSEV, M.S. TSARKOVA, A.N. TIMONIN, I.S. ZAIYTSEV, S.N. DMITRIEVA, S.P. GROMOV
FILMS BASED ON GELATIN WITH INCLUDED CROWN-ETHERS FOR DETECTION OF CALCIUM CATIONS

The novel method of investigation of the crown-ethers selective to the calcium cations – “method of three solutions” - was developed. By means of those method peculiarities of complexation of some derivatives of crown ethers and calcium cations have been studied. The novel recipe of preparation of the sensing materials based on two types of crown-ethers included into the gelatin film has been proposed. It allowed reducing the concentration level of calcium cations determination from 50 mM to 5 mM in the aqueous solutions.

Key words: crown-ethers, complexation, calcium cations, gelatin films, absorption spectra

V.A. SOKOLENKO, N.M. SVIRSKAYA, T.I. KOGAIY, M.S. KARPOVA, I.V. KOROLKOVA
INTERACTION OF RESORCINOL AND 1-ADAMANTANOL

The reaction of the adamantylation of resorcinol and its methyl ester has been studied. Mono- and diadamantyl derivatives of resorcinol and its esters have been isolated and characterized.

Key words: adamantylation, resorcinol, methyl ester

M.A. AKPEROVA, G.M. TALYBOV, S.F. KARAEV
SYNTHESIS AND HETEROCYCLIZATION OF PROPARGYL ETHERS OF 1-HALOGEN-3-ORGANYLOXY-2-PROPANOL

An action of the reagent-supplier of halogen (N-bromosuccinimid or mixture of iodine with clinoptilolite) on equimolar mixture of 3- organyloxy-1-propene with propynol leads to the formation of propargyl ethers of 1-halogen-3-organyloxy-2-propanol. A direction of reaction of catalytic hydratation of the last is determined with halogen atom nature: bromoderivatives transform into expected ketonebromoethers while the iododeriva-

tives are parallelly undergone to hydrolysis on C-I bond at these conditions and transform to hydroxyderivatives of 1,4-dioxane by means of intramolecular ketalization. Products of hydration of propargyl ethers of 1-bromo-3-organyloxy-2-propanol are the key compounds for transition to 2,2,5- threesubstituted of 1,4-dioxane over intermediate hydroxyethers forming by an action of corresponding magnesium organic reagents.

Key words: heterocyclization, 1-halogen-3-organyloxy-2-propanol, halogenalkoxylation

K.L. OVCHINNIKOV, S.S. ROZHKOV, M.S. CHERKALIN, A.V. KOLOBOV, E.R. KOFANOV
QUANTUM-CHEMICAL CONSIDERATION OF TRACKING EFFECT AT NITRATION
OF FUNCTIONAL AROMATIC COMPOUNDS

The influence of substituents in the aromatic ring on the formation enthalpy of σ -complexes and transition states has been considered for the nitration of substrates with single aromatic ring. The ortho-orientation effect has been shown can consist in both the stabilization by the substitutes of transition states and σ -complexes and in the coordination of the nitronium cation with substitute.

Key words: nitration, aromatic electrophilic substitution, tracking effect, quantum-chemical modeling

L.A. ALAKAEVA, F.Kh. NAURZHANOVA

S-AMIDS OF SULFOSALISYLIC ACID AS NEW LUMINESCENT REAGENTS FOR TERBIUM

By means of synthesis the s-amides of sulfosalisylic acid giving bright luminescent reactions with the terbium ions have been obtained. Optimal conditions have been selected. High sensitive methods of terbium determination have been proposed.

Key words: sulfosalisylic acid derivatives, reagent, composition, spectra, luminescence, terbium

A.V. BALMASOV, L.N. INASARIDZE, A.A. ILYIN, V.M. TSYBINA

TITANIUM ANODIC OXIDATION IN ELECTROLYTES ON BASE OF ORGANIC SOLVENTS

The electrolyte composition influence on an anodic titanium behavior and photoelectrochemical properties of the titanium dioxide which is formed during anodic oxidation have been studied. The titanium anodization in solutions containing the cobalt phthalocyanine has been shown to promote the titanium dioxide films formation possessing with the higher photoelectromotive force.

Key words: titanium dioxide, cobalt phthalocyanine, nanotube

M.M. AGAGUSEIYNOVA, G.R. GURBANOV, M.B. ADYGEZALOVA

PHASE EQUILIBRIA IN SnSbBiS_4 - $\text{Sn}_2\text{Sb}_6\text{S}_{11}$ SYSTEM

The SnSbBiS_4 - $\text{Sn}_2\text{Sb}_6\text{S}_{11}$ system has been studied with complex methods of physical-chemical analysis. A state diagram of that system has been constructed. The cut of SnSbBiS_4 - $\text{Sn}_2\text{Sb}_6\text{S}_{11}$ diagram is quasibinary cross-section of tripple SnS - Sb_2S_3 - Bi_2S_3 system. The solubility on the base of both (SnSbBiS_4 , $\text{Sn}_2\text{Sb}_6\text{S}_{11}$) components has been discovered. The solubility on the base of SnSbBiS_4 is 3 mol% at room temperature whereas from $\text{Sn}_2\text{Sb}_6\text{S}_{11}$ side is 2 mol%. Alloys of $(\text{SnSbBiS}_4)_{1-x}(\text{Sn}_2\text{Sb}_6\text{S}_{11})_x$ solid solutions are semi-conductors of p-type conductivity.

Key words: physical and chemical analysis, phase equilibria, SnSbBiS_4 - $\text{Sn}_2\text{Sb}_6\text{S}_{11}$ system, chemical transport reactions

N.V. DVORETSKIY, L.G. ANIKANOVA

PHASE DIAGRAM OF TRIPLE SYSTEM Fe_2O_3 - Fe_3O_4 - CsFeO_2

The phase diagram for Fe_2O_3 - Fe_3O_4 - CsFeO_2 system has been constructed to investigate the chemical composition and to obtain the data on the mutual transitions. The diagram using allows to calculate quickly the phase and chemical composition of the compounds constituting the catalytically active system and to get almost full information on the phisico-chemical state of promoted iron oxide catalyst operating in the dehydrogenation regime.

Key words: ferric oxide, magnetite, cesium monoferrite, phase diagram, iron oxide catalysts, cesium polyferrites, phase composition

E.S. BOBKOVA, V.I. GRINEVICH, E.Yu. KVITKOVA, V.V. RYBKIN

DESTRUCTION OF FORMALDEHYDE AND ACETONE DISSOLVED IN WATER
IN DIELECTRIC BARRIER DISCHARGE OF ATMOSPHERIC PRESSURE IN OXYGEN

The decomposition kinetics of formaldehyde and acetone in their water solution has been studied in a flow reactor of dielectric barrier discharge of atmospheric pressure in the oxygen. Decomposition degrees of mentioned compounds have been determined. The main decomposition products for formaldehyde have been

discovered to be the carbon oxides whereas for acetone- carbon oxides and formaldehyde. In addition, possible mechanisms of proceeding processes are discussed.

Key words: formaldehyde, acetone, aqueous solution, decomposition, dielectric barrier discharge, oxygen

E.S. KONOGOV, Z.M. DKHAN, V.V. KASHNIKOV, Yu.V. TSAREV, A.N. TROSTIN

STUDY OF CATALYSTS PROPERTIES BEING USED FOR ELECTROCATALYTIC PURIFICATION

Catalysts on the base of technical carbon and activated carbon have been investigated. A change of surface free energy depending on a catalyst fractional composition has been shown. Semi-conductor properties of catalysts have been confirmed. The hole type of conductivity has been established. Specific resistivities of catalyst samples have been estimated.

Key words: surface structure, catalysts, electrocatalysis, wastewater purification, gas emissions purification

A.P. BELOKUROVA, V.A. BURMISTROV, A.A. SHCHERBINA, T.M. ZIYADOVA

WATER SORPTION, SWELLING AND WATER PERMEABILITY OF POROUS POLYCAPROAMIDE MODIFIED BY METAL COMPLEX OF PHTHALOCYANINE

The kinetics of water permeability and swelling of porous polycaproyamide membranes modified by metal complex of phthalocyanine was studied. It was shown that the water transport consisted of two flows: phase transfer across a porous area and diffusion transfer across a polymer matrix. The modification of porous membranes by metal complex did not result in considerable changes in aqueous permeability and diffusion coefficients but provided the essential changes in hydrophilic-lipophilic balance of the polymer surface to a side of last.

Key words: swelling, water permeability, polycaproyamide, wetting contact angles

E.O. BUTENKO, G.E. ABROSIMOVA, I.I. ZVER'KOVA, A.E. KAPUSTIN

X-RAY DIFFRACTION AND DESORPTION STUDIES OF CALCINATED SYNTHETIC ANIONIC CLAYS

Processes of desorption of chromate ions were investigated. The thermal and kinetic parameters of thermal processing stratified double hydroxides providing a complete lack of transition of adsorbed substances into the liquid phase due to the formation of spinel-like structures were determined. The zone of safe storage of stratified double hydroxides with adsorbed contaminants was determined.

Key words: stratified double hydroxides, sorption, spinel-like structures, thermal studies

P.B. RAZGOVOROV, V.Yu. PROKOFIEV, S.M. CHAUSOVA

INFLUENCE OF TEMPERATURE FACTOR AT MODIFYING SOLUBLE SILICATES WITH CARBAMIDE

The influence of temperature factor on the interaction rate of water-soluble silicates and carbamide has been studied. Gelation points have been found in solutions of modified potassium and sodium silicates of various densities at 60–90°C as well as the areas corresponding to the growth of particles of SiO₂ polymeric forms and to the accumulation of microgel in a solution and avalanche-like gelation. The behaviour of films received from modified solutions of silicates at variable temperature field (20–200°C) has been studied.

Key words: sodium silicate, potassium silicate, carbamide, thermomechanical curves

A.M. DUNAEV, A.S. KRYUCHKOV, L.S. KUDIN, M.F. BUTMAN

AUTOMATED COMPLEX FOR HIGH-TEMPERATURE RESEARCHES ON BASE OF MASS-SPECTROMETER MI1201

An automated complex for high-temperature research was created and tested on the base of mass-spectrometer MI1201. A performed modernization allowed raising the accuracy and reliability of measurements, to reduce the time of mathematic processing of experimental data and to provide a high level of safety and comfort of operatir working.

Key words: mass-spectrometer, automatization, microelectronics, signal processing

A.A. KOLESNIKOV, A.E. DROGUN

STUDY OF LOW-TEMPERATURE POST-RADIATION POLYMERIZATION OF GLYCERIN TRI ACRYLATE IN ETHYLENE-PROPYLENE RUBBER MATRIX

Radiation cross-linking of ethylene-propylene rubber EPDM-50 in the presence of acrylic ester of glycerin has been investigated. The radiating cross-linking of EPDM-50 in the presence of glycerine triacrylate

(GTrA) has been shown to result in increase of strength characteristics of vulcanizates and to decrease in their relative extentions.

Key words: radiation chemical structurization, ethylene-propylene rubber

N.N. SMIRNOVA, A.Yu. KULAGINA, Yu.A. FEDOTOV

COMPLEXATION OF SULFONATE-CONTAINING POLYPHENYLENPHTHALAMIDES AND POLY-N-(2-AMINOETHYL) ACRYLAMIDE IN WATER – SALT SOLUTION

Effect of neutral salts on thermodynamics of interaction and phase transformations in systems including sulfonate-containing polyphenylen-phthalamides of different structures and poly-N-(2-aminoethyl) acrylamide has been studied. It has been shown that on efficiency of influence on phase separation the cations and anions are arranged in the series $\text{Na}^+ > \text{K}^+ > \text{Li}^+$; $\text{SO}_4^{2-} > \text{Cl}^- > \text{NO}_3^- > \text{Br}^- > \text{I}^-$ practically in the same sequence of decreasing as an ability of mentioned ions to benzene salting out.

Key words: sulfonate-containing polyphenylenphthalamides, interpolymer reactions, binding constants, interpolyelectrolyte complexes

A.S. VYSOKOVSKIY, I.S. KOROTNEVA, S.V. DANILOV

UTILIZATION OF SURFACTANT COMPOSITIONS FOR SYNTHESIS OF GRAFT CARBOXYL-CONTAINING BUTADIENE-STYRENE-BUTYLACRYLATE-METHACRYLAMIDE COPOLYMERS

The composition of Sulfanol NP-3 and DISPONIL AES anionic surfactants has been established to possess more efficiency than individual components. The mixture composition of surfactants providing sufficient rate of polymerization process and aggregative stability of the new polymer dispersions has been determined.

Key words: emulsion polymerization, sulfanol NP-3, disponil aes 63, surfactant compositions

E.I. MELNITSKAYA, S.A. KIRLAN, E.A. KANTOR

REGULARITIES OF RELATIONSHIP STRUCTURE-ACTIVITY OF SELECTIVE SOLVENTS

Study results of relationship of regularities «structure - selectivity» for solvents of hydrocarbonic systems are presented. Mathematical models of theoretical estimation of selective properties with the level of correct recognition of 72-89 % were defined. Results of research can be applied at the forecast, molecular design and a choice of optimum directions of synthesis of new selective compounds.

Key words: selectivity, mathematical models, selective solvents, hydrocarbon systems

D.N. KUZNETSOV, M.O. GLOTOVA, A.G. RUCHKINA, K.I. KOBRAKOV

DYES ON BASE OF 4-AMINOPHENYL-AZO-3,5-DIMETHYLPYRAZOLE. SYNTHESIS AND PROPERTIES

In article, the synthesis scheme of new biocidal azodyes with pyrazole-containing azodyes consisting in a consecutive formation of biophoric and chromophoric groups is described. Synthesized azo-compounds provide the good operational characteristics of the painting received with their help on fabrics and protection against an action of mold fungus.

Key words: azopyrazoles, 4-nitrophenylazo-3,5-dimethylpyrazole, 4-aminophenylazo-3,5-dimethylpyrazole, methylfloroglyutsin, dry and wet friction, washing, fungicidal dyes

O.N. SHCHERBININA, S.S. POPOVA

INFLUENCE OF PRE-TREATMENT POTENTIAL ON CYCLING COPPER – BISMUTH ELECTRODE IN POTENTIODYNAMIC REGIME

Thin film electrodes BiCuCa have been obtained by means of electrochemical cathode intrusion. Diffusive-kinetic characteristics of these electrodes have been calculated. Their phase composition has been determined by X-ray structural analysis. A penetration depth of metals into substrate metal has been determined with a laser micro spectral analysis. The $\text{Ca}_x\text{Bi}_y\text{Cu}$ electrodes have been established to possess a good reversibility. It allows to recommend them for current sources with Ca – anode.

Key words: cathode intrusion, matrix, current chemical sources

A.B. KAPRANOVA, A.I. ZAIYTSSEV, A.V. DUBROVIN, Yu.V. NIKITINA, A.M. VASILIEV MOVEMENT MODEL OF CARRIING PHASE OF BULK MIXTURE IN ROLLING GAP WITH SPHERICAL MATRIX

Mathematical description of carrying phase behavior of the bulk mixture in the rolling gap with a spherical matrix based on the heterogeneous systems mechanic has been proposed at deaeration process. The estimation method for roll angular velocity has been developed which depended on the desired value of fine mixture

compaction degree in device cells of mentioned type according to the technological targets of packed granules production.

Key words: fine-particle mixture, deaeration, carrying and disperse phases, porosity, fractional void volume, Darcy's law, gas permeability, heterogeneous media mechanics

B.Sh. BRAVERMAN, Yu.V. TSIBULNIK, Yu.M. MAXIMOV

OBTAINING NITRIDED FERROVANADIUM ALLOY AT FORCED NITROGEN FILTRATION

It was shown that nitrided ferrovanadium alloy could be obtained by self-propagating high-temperature method at pressure close to atmospheric one in nitrogen flow. The propagation velocity and the temperature of process are determined with a heat transfer by gas flow.

Key words: ferro-alloys, nitriding, flow reactor

E.M. SHADRINA, A.S. UGLOV

EXERGY ANALYSIS OF RECTIFICATION PROCESS OF BINARY MIXTURE

In given article the thermodynamic analysis of the rectification column for mixture separation of organic solvents as an element of the complex thermodynamic system consisting of several elements is presented.

Key words: exergy, exergy efficiency, thermodynamic analysis, thermodynamic system, rectification

A.V. VETYUGOV, V.P. ROMANOV, A.V. BOGORODSKIY, V.A. BEZLEPKIN, V.N. BLINICHEV

INTENSIFICATION OF PROCESS OF PRESS-POWDERS PREPARING FROM FINE DISPERSED CORUNDUM CERAMIC MIXTURES

The possibility of intensifying the process of preparing press powders from fine dispersed ceramic mixtures based on white electro corundum F1200 with the help of experimental industrial unit based on roll and plate mill equipped with a multifunctional vectorial frequency transformer is shown. The efficiency of obtaining the powder is reached because in the same working chamber the processes the dispersion, mixing, bracketing and granulating were combined to eliminate a number of in-between operations and to minimize the share of manual labour. The influence of form and size of spinning holes, speed of plate rotation and force of holding rolls down on the process of granulation has been experimentally studied. At optimal geometric and kinematic parameters, a powder with good fluidity has been obtained. It allowed to obtain a high press density of ceramic goods at semi-dry pressing.

Key words: granulation, press-powders, pressure, rotation frequency, humidity

S.V. BAIYKOV, E.E. FROLOVA, V.V. SOSNINA, S.V. KRASNIKOV, E.R. KOFANOV

SYNTHESIS OF 4-(5-METHYL-1,2,4-OXADIAZOLE-3-YL)BENZOIC ACID BY CATALYTIC OXIDATION WITH MOLECULAR OXYGEN

The method for producing 4-(5-methyl-1,2,4-oxadiazole-3-yl)benzoic acid with a selective oxidation of methyl group of the aromatic ring in the presence of a metal-bromide complexes with oxygen in acetic acid has been developed.

Key words: 1,2,4-oxidiazole, carboxylic acid, oxidation, metal-complex catalysis

A.Ye. KAPUSTIN

RESEARCH OF REACTION PRODUCTS OF MERCARBIDE AND HYDRAZINE

In order to establish the composition of mercarbide the composition of products of its reduction with hydrazine has been studied with chromatographic method.

Key words: mercarbide, structure