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A B S T R A C T S

T.V. LEVENETS, V.O. KOZMINYKH, E.N. KOZMINYKH

REACTION OF 3-ARYLHYDRAZONO-2,4-DIOXOALKANOATES WITH p-TOLUIDINE

Reaction of 3-arylhydrazono-2,4-dioxoalkanoates with p-toluidine was studied. The structure peculiarities of synthesized compounds based on IR and NMR spectroscopy data are discussed.

Key words: 3-arylhydrazono-2,4-dioxoalkanoates; p-toluidine, 3-arylhydrazono-2,4-dioxoalkanoic acid 4-tolylamides, 1-(4-tolyl)-4-aryldiazo-3,5-dihydroxy-5-methyl-2,5-dihydropyrrol-2-ones

K.A. SHREIYBER, B.V. MURASHEVICH, O.S. LEBED

SYNTHESIS OF 1- (4-HYDROXYPHENYL)-3- (4-NITROPHENYL)-5-ALKYL-1,2,4-TRIAZOLES

A new method for the synthesis of 1,2,4-triazole derivatives through the reaction of quinogenic hydrazonoilchlorides with monoalkylamine are proposed. This reaction proceeds under mild conditions and does not require the use of scarcely available reagents. The synthesized compounds are of considerable interest for the screening of new bioactive compounds. Probable chemistry of the reaction was considered.

Key words: quinonimines, triazenes, triazoles, cyclization

Yu.K. SUNTSOV, V.A. GORYUNOV, A.M. CHUIYKOV

BOILING TEMPERATURES AND EXCESS THERMODYNAMIC FUNCTIONS OF *n*-BUTANOL-*n*-ALKYL-2-METHYLPROPANOATE SOLUTIONS

The boiling temperatures were measured with the ebullioscopy method at different pressures for four binary systems. The composition of equilibrium vapor phases of systems was calculated on pressure isotherms of saturated vapor. On the basis of this data the excess thermodynamic functions of system solutions were calculated.

Key words: phase liquid-vapor equilibria, excess Gibbs energy, enthalpy, entropy, solutions, n-butanol, n-alkyl-2-methyl propanoates

A.M. EFREMOV, D.B. MURIN

ELECTRO-PHYSICAL PROPERTIES OF PLASMA IN BINARY HCl+Ar, He, H_2, O_2 AND Cl_2 GASEOUS MIXTURES

The experimental investigation and the model-based analysis of the influence of initial composition of the binary HCl + Ar, He, H_2, O_2и Cl_2 gas mixtures on the steady-state plasma parameters and densities of charged species were carried out under the conditions of direct current glow discharge. The data on reduced electric field strengths, electron mean energies and electron densities were obtained. The formation and decay mechanisms for both electrons and ions were analyzed.

Key words: plasma, hydrogen chloride, rate coefficient, kinetics, concentration

R.V. ABRAZHEEV, M.V. GRIBANOVA, A.A. DUBTSOVA, D.A. MAKAROVA, E.V. VOIYTKEVICH

SPECTROPHOTOMETRIC STUDY OF COMPLEXATION OF CERIUM AND LANTHANUM IONS WITH ARSENATES, SULFATES, PHOSPHATES AND CHLORIDES USING COMPETING REACTIONS

A set of mathematical equations to calculate the formation constants of colorless complexes is proposed on the data of spectrophotometric analysis. They are used the results of the spectrophotometric study of competing reactions between: 1) complexing agent and ligand, and 2) complexing agent and dye. The complexation constants of cerium and lanthanum with phosphates, arsenates, sulfates, and chlorides were determined.

Key words: formation constants, colorless complexes, spectrophotometric determination, competing reactions, cerium (III) and lanthanum ions, phosphates, arsenates, sulfates, chlorides

G.G. KUTLUGILDINA, D.K. ZINNATULLINA, Yu.S. ZIMIN

KINETICS OF OZONE CONSUMPTION IN REACTION WITH POLYVINYL ALCOHOL

The kinetic regularities of polyvinyl alcohol oxidation were studied using the spectrophotometric method on consumption of ozone in a liquid phase (H_2O). It was shown that in reaction under study at the temperature of 6- 32°C ozone is consumed on the second order low. The reaction rate constants and activation parameters of reaction were determined.

Key words: polyvinyl alcohol, oxidation, ozone, kinetics, reaction activation parameters

Z.N. ESINA, M.R. KORCHUGANOVA

MELTING AND BOILING TEMPERATURES OF ORGANIC COMPONENTS

Models for calculation of the melting temperature and the boiling temperature of n-alkanes, carboxylic acids, n-alcohols and aldehyde were proposed. On the results of calculation of the melting and boiling temperatures the eutectic and azeotropic parameters of n-alcohol–hexane system were founded.

Key words: melting temperature, boiling temperature, organic compounds

R.R. SYRLYBAEVA, S.N. GUSEIYNOVA, N.Ch. MOVSUM-ZADE, E.M. MOVSUM-ZADE

COMPARATIVE ANALYSIS OF PHYSICOCHEMICAL AND THERMODYNAMIC PARAMETERS OF NON-ORGANIC DERIVATIVES OF NITRILES

The work presents the calculations of thermodynamic parameters of complexes of previously obtained functionalized chlor-silicium organic nitriles with salts of transition metals. It was shown that in the set of $CoCl_2$>$CuCl_2$>$NiCl_2$>$ZnCl_2$, thermodynamic advantages of complexation reactions and stability of obtained coordinating compounds is decreased.

Key words: nitriles, organosilicon nitriles, silanes, DFT- calculations, transition metals complexes

A.A. FEDOROVA

THERMODYNAMICS OF I,I–ELECTROLYTES ADSORBTION FROM BINARY ETHANOL-WATER SOLVENTS AT SOLUTION-AIR INTERFACE

The adsorption isotherms of hydrogen, sodium and potassium chlorides from water and ethanol-water solvents were experimentally measured at 298 and 303K. Based on the proposed models of electrolyte ions adsorption the differential heats and entropies of adsorption were calculated. The values of thermodynamic characteristics of chlorides adsorption and structure of the surface layers were foumd to determine with features of cation solvation.

Key words: adsorption, isotherms, thermodynamics, heat, entropy, solvation

A.V. BESPALOV, V.D. BUIKLISKIY

AGGREGATION OF SILVER SOLS STABILIZED BY POLYETHER LAPROL 5003 IN ISOPROPANOL SOLUTIONS

The processes of electrolyte-induced and photostimulated aggregation of silver sols in isopropanol were investigated. It was shown that the stability of silver sols is caused by electrostatic repulsion between nanoparticles and polymeric depletion stabilization.

Key words: silver sols, nanoparticles, photostimulated aggregation, polyether, stabilization

A.E. KISELEV, L.S. KUDIN, A.P. ILYIN, A.A. ILYIN

STUDY OF IRON OXIDE CATALYST $K_2O{\cdot}NFe_2O_3$. IV. VAPORIZATION OF K_2O FROM ACTIVATED CATALYST

The results of vaporization study of the K_2O promoter as a component of iron oxide catalyst reduced by the thermal dissociation in vacuum up to catalytically active form K_2O – mFe_3O_4 (m = 0.67 , 2, 4, 6 mol. fraction) are reported. It was shown that evaporation of the promoter occurs from the surface of activated catalyst in the form of atomic potassium. In the range of 800 - 1100 K the temperature dependences of potassium pressure and the enthalpies of vaporization of promoter for the samples of different composition were determined. The influence of synthesis conditions on the high-temperature behavior of the system, the active component Fe_3O_4 – promoter K_2O, was revealed.

Key words: mechanical activation, catalyst, promoter, vapor pressure, vaporization enthalpy, high temperature mass-spectrometry

E.I. SVIRIDOVA, M.Yu. PLETNEV, A.V. PONTRYAGINA

EFFECT OF ETHERPHOSPHATES AND ETHERCARBOXYLATES ADSORPTION LAYERS ON STEEL ELECTROCHEMICAL CORROSION IN NEUTRAL MEDIA

The data on surfactants effect from series of ethercarboxylates and etherphosphates on low-carbon steel electrochemical corrosion in borate buffer neutral media by means of electrochemical and ellipsometric analysis methods are present. The results show that the additive of surfactants depresses corrosion of St3. The protection degree depends on its concentration and nature. Retardation of corrosion process is due to the inhibitor adsorption on the metal surface.

Key words: adsorption, surfactants, corrosion inhibitors, electrochemical corrosion, ellipsometry, etherphosphates

S.Z. KALAEVA, V.M. MAKAROV, N.S. YAMANINA, I.N. ZAKHAROVA, A.N. SOLOVYOVA, M.S. MALTSEVA, A.M. SHIPILIN, M.E. TERZI

EFFECT OF ELECTROLYTE TEMPERATURE ON RATIO OF LEPIDOCROCITE, GOETHITE, AND MAGNETITE AT ELECTROCHEMICAL SYNTHESIS OF MAGNETITE

The given paper aims to study the temperature effect of the hydrogen chloride electrolyte on the percent ratio of forming lepidocrocite, goethite and magnetite and on achievement of maximal yield of last at the lowest temperature. Identification of the purity of the magnetite was carried out by Mossbauer and X-ray methods.

Key words: magnetite, Mossbauer and X-ray methods, electrochemical method, electrolyte

N.A. YASHTULOV, M.V. LEBEDEVA, V.O. ZENCHENKO, V.R. FLID

FORMATION OF ELECTRODE MATERIALS WITH BIMETALLIC PLATINUM AND RUTHENIUM NANO-PARTICLES ON POLYMER MATRIXES

It was performed the formation of the electrode bimetallic nanocomposites on polymer matrix-substrate. The sudy of the phase composition was carried out. The data of electronic microscopy and low-angle X-ray scattering were obtained.

Key words: bimetallic nano-particles, metal-polymer nanocomposites, low-angle X-ray scattering, electron microscopy

A.A. YUSOVA, I.V. GUSEV, I.M. LIPATOVA

STUDY ON PHYSICAL-MECHANICAL AND DRUG DELIVERY PROPERTIES OF MIXED HYDROGELS BASED ON SODIUM ALGINATE AND HIGH METHOXYLATED PECTIN

The fluid and form-stable mixed hydrogels on the base of sodium alginate and high methoxylated pectin were obtained by the method of ionotropic jellification with calcium ions. The pronounced synergistic effect of the mixing in respect of structuring these systems was discovered. The influence of the composition of alginate-pectin hydrogels on their physical-mechanical properties and the rate of release of the incorporated drug by example dioxydine was studied.

Key words: sodium alginate, high methoxylated pectin, ionotropic jellification by calcium ions, hydrogel physical-mechanical properties

A.I. MIKULINA, V.V. FROLOV, I.S. KOROTNEVA, B.S. TUROV, E.A. POLYAKOVA

GRAFT-COPOLYMERIZATIONOF OF BUTYL ACRYLATE AND CASEIN IN PRESENCE OF INITIATORS OF DIFFERENT NATURE

Aqueous dispersions of graft-copolymers based on butyl acrylate and casein were synthesized with the radical emulsion polymerization. The water soluble and slightly soluble initiators were used for initiation. The kinetic dependences of synthesis were studied. The dosage of activating group providing maximal yield of grafted polymer was established. The composition of obtained copolymers was determined by the Kjeldahl method on the amount of mineralized nitrogen. Tests of synthesized aqueous dispersions of co-polymers as adhesives for the different surfaces gave the positive effect.

Key words: butylacrylate, casein, initiator, graft-copolymer, elasticity, adhesion

S.N. KUZMENKO, P.I. BASHTANNIK, N.Ya. KUZMENKO, A.M. IGONINA, Ya.I. EVTUSHENKO

INFLUENCE OF NATURE OF TITANALCOXY-CONTAINING SIZE ON PROPERTIES OF BASALT-PLASTICS BASED ON POLYPROPYLENE

In given study the generalization of experimental results on development of composite materials based on polypropylene filled with basalt fibers was carried out. [Butoxy][acrylateacyloxy]titanium, tris[(butoxy)-(acrylateacyloxy)titanate]borones were used as the sizes.

Key words: basaltplastics, dressing, [butoxy][acrylateacyloxy]titanium, tris[(butoxy)-(acrylateacyloxy)titanate]boron, adhesion strength, tensile strength, extrusion molding

S.P. BOBKOV, I.V. POLISHCHUK

MODELING PROCESS OF BODY DEFORMATION APPLYING CELL AUTOMATA

The paper is devoted to study of deformation of solid bodies using discrete dynamical models. The behavior of elastic and viscoelastic bodies under mechanical loads is considered. The influence of dissipative component on mechanical behavior of solid body at impact was shown.

Key words: mathematical simulation, discrete models, cellular automata, body deformation

A.V. MITROFANOV, V.E. MIZONOV, K. TANNOUS

MATHEMATICAL MODEL OF FLUIDIZED BED STATE EVOLUTION AT MOISTURE TRANSFER

A cell mathematical model of evolution of the moisture content and heat distribution in particles in a fluidized bed was proposed. The model includes two parellel chains of cells for particles and gas with the intermutual influence of transition probabilities in homologic cells. Besides that, the homologic cells can exchange with heat and moisture at each time transition. Some results of numerical modeling the process are presented.

Key words: fluidized bed, state vector, transition probabilities matrix, particle settling velocity, heat transfer, mass transfer, moisture content

R.A. KANTYUKOV, O.B. BUTUSOV, V.P. MESHALKIN, R.K. GIMRANOV, A.G. POPOV, I.V. RYZHENKOV

COMPREHENSIVE FRACTAL-TEXTURE ANALYSIS OF GAS FLOW TURBULENT STRUCTURE IN CONVERGENT TUBES OF COMPLEX PIPELINE

The cluster analysis of two-dimensional model gas flow in two-dimensional convergent tube based on estimation of fractal dimension and texture indices was carried out. Using computer experiments it was shown that in the wavelet spectrum of model shock wave gas flow there are percolation clusters stretching from one to another wall of the tube. These clusters might be the source of vibration instability of pipeline. Model was used for gas flow calculation in ethylene production pipe.

Key words: unsteady model two-dimensional gas flow, pipeline, mathematical modeling, convergent tube