

А B S T R A C T S

**R.M. GUSEINOV, S.M. GADZHIEV**  
**NEW METHOD OF ACTIVATION OF SOLID ELECTROLYTES**

The comparative analysis of a well-known methods of increasing the conductivity (activation) of the solid electrolytes such as: 1) doping method; 2) method of hydration of oxides and some heteropolyacides; 3) creation of composite or distributed structures has been carried out. The new method of activation of solid electrolytes by passing of short time ( $10^{-6}$ S) high voltage pulses through them has been proposed. The advantages of the new method in comparison with existing methods are illustrated by the examples of proton sulfate solid electrolytes.

**Key words:** solid electrolyte, conductivity activation, ion compounds, high voltage impulse

**Yu.M. KOMAROV, N.N. SMIRNOV, A.P. YLYIN**  
**INFLUENCE OF CONDITIONS OF MECHANOCHEMICAL SYNTHESIS WITH APPLICATION OF ACTIVE GASEOUS MEDIA ON COMPOSITION OF OBTAINED SALTS**

The method of direct mechanochemical synthesis with application of gaseous  $\text{NH}_3$ ,  $\text{CO}_2$ ,  $\text{H}_2\text{O}$ ,  $\text{O}_2$  and solid components (Cu, Zn) has been studied. This method allows to obtain carbonate- ammine of copper, carbonate- ammine of zinc, hydro carbonates of copper, zinc and their double salts without liquid phase. The effect of the components ratio of gaseous phase and conditions of synthesis on composition of final products has been studied.

**Key words:** heterogeneous mechanical-chemical synthesis, carbonate- amines, copper, zinc

**G.K. SHURDUMOV, E.Kh. TLIMAKHOVA**  
**SYNTHESIS OF HIGH-DISPERSIVE NICKEL TUNGSTATE  $\text{NiWO}_4$  IN  $(\text{K}_2\text{WO}_4 - \text{KCl})_{\text{ЭВТ.}}$  -  $\text{NiSO}_4$   $(\text{K}, \text{Ni}||\text{Cl}, \text{SO}_4, \text{WO}_4)$  MELT**

Experimental data on syntheses and identification of high-dispersive nickel tungstate in melt of  $\text{NiWO}_4$  in  $(\text{K}_2\text{WO}_4 - \text{KCl})_{\text{ЭВТ.}}$ - $\text{NiSO}_4$   $(\text{K}, \text{Ni}||\text{Cl}, \text{SO}_4, \text{WO}_4)$  system are given.

**Key words:** synthesis, nickel tungstate, thermal analysis, fusion diagram

**E.V. RUMYANTSEV, A. DESOKI, E.V. ANTINA**  
**STUDY OF EQUILIBRIUMS OF FORMATION AND STABILITY OF DIPYRROLYLMETHENES OF COPPER AND NICKEL IN DIMETHYL FORMAMIDE**

Complexation reactions of Cu(II) and Ni(II) acetates with symmetric and asymmetrical alkyl substituted of 2,2'-dipyrrolylmethenes in dimethyl formamide have been studied by electron spectroscopy method at 298.15 K. Main reaction products were hetero- or homo ligandes complexes depending on initial concentration of reagents. These complexes had the difference positions of adsorption band maxima in electron spectra. Consecutive and total equilibrium constants have been determined on the base of spectral data. Regularities of complex stability changes have been marked depending on the nature of complexing cation and ligand.

**Key words:** electron spectroscopy, complexation, copper and nickel acetates, dimethyl formamide, dipyrrolylmethenes

**I.E. YAKUNINA, A.N. SHCHUKIN, I.V. SHAHKEL'DYAN, A.N. SHUMSKIY, O.I. BOIYKOVA,**  
**Yu.M. ATROSHCHENKO, K.I. KOBRAKOV**  
**PROTONATION REACTION OF ANIONIC ADDUCTS OF 2,4-DINITRONAPHTHOLE**

The 3-substituted 2,3-dihydronaphtholenes have been obtained by protonation of anion Yankovskiy adducts of the 2,4-dinitronaphthole. The configuration of asymmetrical atoms has been established by the me-

thod of NMR spectroscopy and by calculations of vicinal constants on equation of the Karplus-Bathner-Bay

**Key words:** protonation, 2,4-dinitronaphthole, NMR, 2,3-dihydronaphtholenes.

*S.B. NOSACHEV, A.G. TYRKOV*

#### **REACTIONS OF SALTS FORMATION OF SUBSTITUTED 5-NITROMETHYL-1, 2, 4-OXADIAZOLES AND 4-DINITROMETHYL-1, 2, 3-TRIAZOLES**

Reactions of substituted 5-nitromethyl-1, 2, 4-oxadiazoles and 4-dinitromethyl-1, 2, 3-triazoles with alcohol solution of the potassium hydroxide or hydrazine-hydrate have been shown to result in the formation of salts of aci-tri, di or mono nitro amines depending on the nature of nitro methyl substitute.

**Key words:** 5-nitromethyl-1, 2, 4-oxadiazoles, 4-dinitromethyl-1, 2, 3-triazoles, nitro methan, reactions

*A.S. CHUVASHLEV, D.V. KRYL'SKIY*

#### **5-AMINO-3-ALKYL-4-ARYLPYRAZOLES IN SYNTHESIS OF PYRAZOLO [1, 5-a] PYRIMIDINES**

A set of pyrazolo [1,5-a] pyrimidinones with various substituents in condensed cycle have been obtained by condensation of 5-amino-3-alkyl-4-arylpyrazoles with  $\beta$ -ketoesters. The ability of transformation of the carbonyl group into the thio one followed by alkylation of sulfur atom has been demonstrated. The interaction of aminopyrazoles 1 with halcones and arylidencyclohexandiones results in the dihydrodiarylpyrazolo [1,5-a] pyrimidines and aryltetrahydropyrazolo [5,1-b] quinazolinones, respectively. The condensation with enamionones, obtained by interaction of dimethylacetal of DMF with acetophenone, benzalacetone and dehydracetic acid the pyrazolo[1,5-a]pyrimidines derivatives have been synthesized.

**Key words:** condensation, 5-amino-3-alkyl-4-arylpyrazole,  $\beta$ -ketoester, pyrazolo [1,5-a] pyrimidinone, synthesis

*O.I. BOIYKOVA, V.K. SHCHELCYN, L.P. VASHCHEKINA, Yu.N. NESTEROVA, M.A. TITOV, A.N.*

*SHUMSKIY, I.V. SHAHKEL'DYAN, K.I. KOBRAKOV, Yu.M. ATROSHCHENKO*

#### **SYNTHESIS OF COMBINATORIAL LIBRARIES OF AMIDES, SULFAMIDES AND UREAS FROM 2-ACYLDERIVATIVES OF 4-R-BENZO [d] THIAZOLE-2,6-DIAMINE**

The effective method of obtaining the 2-acyl derivatives of the 4-R-benzo[d]thiasole-2,6-diamines by hydrogen reduction on the Pd catalyst in DMF of appropriate N-(4-R-6-nitrobenzo[d]thiasol-2-yl)amides has been proposed. A number of sulfamides, amides and carbamides derivatives of the 4-R-benzo[d]thiasole-2,6-diamine for highly productive bio screening has been synthesized with the method of liquid phase parallel synthesis.

**Key words:** 2-acyl derivatives of the 4-R-benzo[d]thiasole-2,6-diamine, Pd catalysts, hydrogen, reduction

*I.G. DMITRIEVA, L.V. DYADYUCHENKO, V.D. STRELKOV*

#### **UNUSUAL ALKYLATION PRODUCTS OF 3-CYANO-2(1H)-PYRIDINTHIONES AND THIENOPYRIDINES ON THEIR BASE**

The product of double N- and O-acylation has been synthesized by interaction of chloracetylchloride with the excess of the N-methyl ethanolamine. Unusual alkylation products have been obtained by means of 2-chloromethyl (methyl) carbox-amidoethyl-2-chloracetats interaction with 3-cyano-2(1H)-pyridinthiones, which have been cyclized into appropriate thieno[2,3-b]pyridines in Thorpe- Ziegler reaction.

**Key words:** chloracetylchloride, N-methylethanolamine, 3-cyano-2(1H)-pyridinthione, alcylation, Thorpe- Ziegler reaction

*N.N. SMIRNOVA, Yu.A. FEDOTOV*

#### **PRODUCTION AND ESTIMATION OF SEPARATING CAPACITY OF POLYELECTROLYTE COMPLEXES BASED ON WATER – SOLUBLE COPOLYMERS OF AROMATIC SULFONATE – CONTAINING POLYAMIDES**

Reactions of formation of polyelectrolyte complexes based on water soluble copolymers of aromatic sulfonate containing polyamides and polyethylenimine have been studied with methods of potentiometry, tur-

bidimetry, IR spectroscopy and element analysis. On the base of studied complexes the film materials with high selectivity in pervaporation processes of water alcohol mixtures separation have been obtained.

**Key words:** polyelectrolyte complex, aromatic polyamides, formation reactions, water-alcohol mixture separation

*L.G. EVSEVLEEVA, N.N. DOBRYNINA, L.M. BYKOVA*

#### **DIHYDROQUERCETINUM CONTENT DETERMINATION IN SAMPLES OBTAINED WITH MEMBRANE PURIFICATION AND IDENTIFICATION OF MAIN ADMIXTURES**

The dihydroquercetinum obtained with the membrane method has been analysed on content of impurity in it such as the quercetinum, aromadendrin, naringenin, luteolin and etc. by means of high-performance liquid chromatography. According to these data the purity of obtained dihydroquercetinum corresponds to the standard sample.

**Key words:** chromatography, dihydroquercetinum, membrane purification, purity degree

*A.Yu. NIKIFOROV, R.S. KUMEEV*

#### **EXPERIMENTAL DETERMINATION OF ROTATIONAL MOBILITY OF PHENANTHRENE MOLECULES IN METHANOL BY METHOD OF MAGNETIC RELAXATION OF $^{13}\text{C}$ NUCLEI**

In the given study the method of nuclear magnetic relaxation has been applied to study of rotational mobility of phenantrene molecules in methanol. The phenantrene has been chosen as model object close to own isomer- anthracene possessing expressed carcinogenic properties. The anthracene itself possesses relatively high melting temperature and dissolves slightly in most part of solvents. A anthracene solubility is one order of magnitude higher. The methanol has been chosen as solvent because its properties is close to properties of water: existence of high amount of hydrogen bonds per volume unit, slight molecules size, and approximately the same value of kinematic viscosity. The phenantrene solubility in methanol is quite enough for carrying out measurements of spin-lattice time relaxation of  $^{13}\text{C}$  nuclei of phenantrene molecules.

**Key words:** phenantrene, rotational relaxation, methanol,  $^{13}\text{C}$  NMR

*A.A. SMIRNOV, A.M. EFREMOV, V.I. SVETTSOV*

#### **KINETIC AND TRANSPORT PARAMETERS OF PROCESSES UNDER ACTION OF ELECTRON IMPACT IN HBr**

The set of cross-section of electron impact processes for HBr molecules has been formed. The calculations of electron energy distribution function, electron transport characteristics and rate constants for electron impact processes have been carried out using the solution of stationary Boltzmann equation in the framework of the one-component approximation.

**Key words:** impact cross-section, electron impact, electron energy distribution function, hydrogen bromide

*A.V. ZUEV, A.V. TVARDOVSKIY*

#### **EQUATION OF MULTICOMPONENT ADSORPTION AND ABSORPTION**

On the base of phenomenological thermodynamics the equation allowing describing both the multi component adsorption and absorption from single viewpoint has been deduced. The well-known Henry, Langmuir, Fowler-Guggenheim and Temkin adsorption equation (generalized for gas mixtures) have been shown to deduce relatively easy from the equation proposed with constants having a clear physical meaning.

**Key words:** generalized adsorption equation, adsorption thermodynamics, absorption

*Ya.N. BABAEV, G.T. MAMEDOVA*

#### **PHASE EQUILIBRIUM IN SYSTEMS $\text{CuInSe}_2$ -Bi(I), AND $\text{CuInSe}_2$ -BiI**

The phase equilibrium in systems  $\text{CuInSe}_2$ -I,  $\text{CuInSe}_2$ -Bi and  $\text{CuInSe}_2$ -BiI has been studied. The state diagrams of system mentioned above have been obtained. Phase diagrams of  $\text{CuInSe}_2$ -I(Bi) systems has been shown to be the simple with degenerated eutectic. The  $\text{CuInSe}_2$ -BiI system is characterized with complex inte-

reaction. Phase transition inherent in  $\text{CuInSe}_2$  is remained for studied systems. On the base of triple compound the solid solution are formed.

**Key words:** phase equilibrium, phase diagram, solid solutions, eutectic

*E.M. DVORYANOVA, I.M. KONDRATYUK, I.K. GARKUSHIN*

#### **PREDICTION OF EUTECTIC CHARACTERISTICS IN TRIPLE RECIPROCAL SYSTEMS $\text{Li}_2\text{M}(\text{F}, \text{I})_4$ (M = Na, K, Rb, Cs)**

The method of determination of parameters of triple eutectic points which has been modified for triple component reciprocal systems with the presence of fluorine-iodine exchange and fields of liquid phase separation has been proposed.

**Key words:** eutectic points, triple system, fluorine-iodine exchange

*E.Yu. MOSHCHEVSKAYA, I.K. GARKUSHIN*

#### **CALCULATION OF PARAMETERS OF QUATERNARY EUTECTICS**

The computational algorithms (procedure) and computer program of calculation of eutectic characteristics for four-component systems have been developed. The approbation of developed methodology has been carried out using of investigated previously four-component eutectic systems as example.

**Key words:** eutectic parameters, four component systems, calculation method

*A.V. ISAEV, M.G. MIKHALENKO*

#### **NICKEL ANODE OXIDATION IN SULFAMATE ELECTROLYTE OF NICKEL-PLATING IN RANGE OF POTENTIALS PRECEDING «BASIC» PASSIVATION**

The nickel anode oxidation in sulfamate electrolyte occurs on two parallel ways. On some sites of surface where water molecules adsorb, there is an anode oxidation of nickel with formation of  $\text{NiOH}_{\text{ads}}$ , followed by oxidation to the nickel oxide with the limiting step of the second electron detachment. On the other parts of surface where the sulfamate ions adsorb there is an nickel anode oxidation to  $\text{Ni}(\text{NH}_2\text{SO}_3)_{\text{ads}}$ , followed by the  $\text{Ni}^{2+}$  formation with limiting step of the first electron detachment. The influence of sulfamine acid and chloride ions on nickel anode oxidation has been studied.

**Key word:** anode oxidation, nickel, sulfamate electrolyte, process mechanism

*I.A. BELOVA, A.S. GRODSKIY, K.I. KIENSKAYA*

#### **AGGREGATIVE STABILITY OF YTTRIUM OXYHYDROXIDE HYDROSOLS**

The influence of dispersive medium pH and electrolytes on aggregative stability of yttrium oxyhydroxide hydrosols obtained with condensation method has been studied. The sol under study has been established to be stable to coagulation in narrow pH range from 6.9 up to 8.2. A sol coagulation with nitrate and sulfate ions proceeds on various mechanisms. Under input of the sodium nitrate the yttrium oxyhydroxide particles aggregates reversibly in second energetic minimum. Under addition of the sodium sulfate the irreversible sol coagulation takes place. In this case under the action of ultrasound the peptization is not observed. The yttrium oxyhydroxide hydrosols stability to coagulation has been shown to determine not electrostatic factor only but existence on particles of highly hydrated gel-layers.

**Key words:** aggregative stability, hydrosol, yttrium oxyhydroxide

*V.S. STAROVA, S.A. KULICHENKO*

#### **ACID-INDUCED MICELLAR PHASES OF SODIUM DODECYLSULPHATE FOR CONCENTRATING OF ORGANIC SUBSTRATES**

The influence of the aromatic and aliphatic acids addition on parameters of phase formation in the sodium dodecylsulphate solutions has been studied. The decrease of phase-formation temperature and volume of forming micellar phase in the presence of acid additions has been established. The formation of compact gel phases under common introducing the acids and electrolytes in solution of dodecylsulphate has been shown. The high efficiency of extraction of hydrophobic organic substrates of cation nature to gel anion-active phases has been shown.

**Key words:** aromatic and aliphatic acids, phase formation, solutions, sodium dodecylsulphate, sol, gel

*A.E. CHALYKH, V.K. GERASIMOV, G.S. KULAGINA*  
**RHEOLOGY OF AQUEOUS SOLUTIONS OF HYDROPHILIC POLYMERS  
AND ADDUCTS OF TETRAMETOXYSILANE**

Rheological behavior of aqueous solutions of hydrophilic polymers (poly vinyl pyrrolidone, poly vinyl caprolactam, poly vinyl alcohol) and products of tetra methoxy silane hydrolysis have been considered in the field of true solutions that is up to a moment of three dimensional structure formation of poly silica acid. The viscosity has been shown to determine of concentration of high molecular component. The sizes of micro molecular balls in dilute solutions have been estimated. The conclusions about segments packing factor and their permeability for solvent molecules and fragments of micro molecules of silica acid have been done.

**Key words:** aromatic and aliphatic mono carbonic acids, phase formation, solutions, sodium dodecyl sulphate, sole, gel

*I.A. VERSHININA, O.V. GORNUKHINA, I.V. PIMKOV, O.A. GOLUBCHICOV*

**USE OF 5,10,15,20-TETRAKIS(4'-CARBOXYPHENYL)PORPHYRIN AND ITS COBALT COMPLEX  
FOR MODIFICATION OF SURFACE OF POLYPROPYLENE MATERIALS ACTIVATED BY VARIOUS  
CHEMICAL METHODS**

Experimental results showing possibility of surface modification of polypropylene materials with application of porphyrins and metal porphyrins containing carboxyl groups on periphery of macro cycle are presented. New methods of chemical activation of material surface have been proposed. The rate effective constants of oxidation reaction of sodium diethylthiocarbamate with air oxygen which are catalyzed by the Co-5,10,15,20-tetrakis(4'-carboxyphenyl) porphyrin have been found.

**Key words:** polypropylene, surface modification, metal porphyrins, oxidation, catalysis

*A.M. AIIEV, R.M. MURADKHANOV, G.Z. SULEYMANOV, Z.G. KURBANOV,  
I.G. MELIKOVA, A.I. RUSTAMOVA*

**INVESTIGATION OF KINETIC REGULARITIES OF PROCESS OF CATALYTIC  
MONOMERIZATION OF DICYCLOPENTADIENE**

The effective catalyst of Fe- clinoptilolite type for dicyclopentadiene monomerization has been developed. Kinetic regularities of process have been studied. On the base of experimental data obtained the step scheme of mechanism of monomerization reaction has been determined.

**Key words:** monomerization, dicyclopentadiene, monocyclopentadiene, Fe- clinoptilolite

*N.V. STEPANOVA, N.V. DOLGOPYATOVA, V.Yu. NOVIKOV, I.N. KONOVALOVA*

**INFLUENCE OF PHYSICAL AND CHEMICAL PROPERTIES OF CHITOSAN ON DEGREE  
OF EXTRACTION OF ORGANIC SUBSTANCES FROM WATER DISPERSIONS**

The influence of a deacetylation degree and molecular weight of chitosan, and also a way of its introduction on efficiency of oil and hydrocarbons extraction from water dispersions has been studied. The probable mechanism of lipids and hydrocarbons interaction with chitosan macromolecules based on adsorption and solubilisation has been discussed.

**Key words:** chitosan, lipids, extraction, adsorption

*A.K. SHIRYAEV, V.A. SHIRYAEV*

**STUDY OF N-ALKYL-1,3-OXATHIOLANE-2-IMINES ISOMERIZATION**

The structure and the Z/E-isomerization of N-alkyl- 1,3-oxathiolane-2-imines has been investigated by X-ray analysis and calculations at MP2 and B3LYP theory levels. The isomerization barrier has been calculated for the N-tert-butyl-5-methyl-1,3-oxathiolane-2-imine.

**Key words:** structure, isomerization, quantum-chemical computation

**O.K. SHVETSOV, A.V. KOMIN, E.Yu. DOUROSOVA, A.V. BORISOV**  
**SOME PECULARITIES OF SYNTHESIS AND PROPERTIES OF ANION-ACTIVE POLYMERIC EMULSIFIERS ON THE BASIS OF METHACRYLIC ACID, ACRYLONITRILE AND 1-METHYL BUTADIENE**

The influence of sodium nitrite on process of copolymerization of the methacrylic acid, acrylonitrile and 1,3-pentadiene and properties of anion-active polymeric emulsifiers on their basis for usage at synthesis of butadien-nitrilnyh caoutchoucks has been studied. It has been shown that the storage of dispersions and water-alkaline solutions of the polymeric emulsifiers on the base of these copolymers within 1,0-1,5 years does not result in change of their properties.

**Key words:** emulsion polymerization without emulsifier, polymer surfactants, co-polymers of methacrylic acid

**I.S. GUDANOV, Yu.B. LAVRENTIEV, G.M. GONCHAROV**  
**FEATURES OF CALCULATION OF OPTIMAL TECHNOLOGICAL AND CONSTRUCTIVE PARAMETERS OF MULTIPLEX WARM UNITS FOR RUBBER MIXTURE CO-EXTRUSION**

The simplified algorithm of calculation of optimal parameters of warm units for rubber mixture co-extrusion has been presented. The algorithm has been based on combination of gliding allowance method and Nelder-Mead method.

**Key words:** warm unit, co-extrusion, rudder mixture, calculation of optimal parameters

**V.F. BABANIN, A.A. ZALUTSKIY, S.Z. KALAEVA, V.M. MAKAROV, N.V. MIKHALEVA, D.E. PUKHOV, G.G. OMELYANYUK**

**CRITERIA OF SUPERMAGNETISM OF NANO-SIZE NATURAL MINERALS OF IRON ON DATE OF MOSSBAUER SPECTROSCOPY  $^{57}\text{Fe}$  AND MAGNETOMETRY**

Examples of application of super magnetism phenomena at solution of some tasks of identification and determination of magnetic parameters of systems  $\beta\text{-FeOOH}$ -carrier where the aluminosilicate (montmorillonite) and globular protein (ferritine) have been used as a carrier have been considered. The idea of phenomena application for purification of waste and recycled water from oil product has been formulated.

**Key words:** super magnetism, magnetic parameters, waste water purification

**Z.A. ALIKHANOVA, A.M. ALIEV, A.A. SARYDZHANOV, M.F. BAKHMANOV**  
**KINETICS OF OXYDATIVE DEHYDROGENATION OF ISOBUTYL ALCOHOL ON BIMETALZEOLITE CATALYST CuPdNaY**

The kinetics of oxydative dehydrogenation of the isobutyl alcohol on bimetal zeolite catalyst CuPdNaY containing  $\text{Cu}^{2+}$ -2.0,  $\text{Pd}^{2+}$ -0.1 mass % has been studied at various temperatures, volume flow rate and partial pressure of reagents. On the base of experimental data the kinetic scheme of process has been proposed and the kinetic model of process has been developed. Values of kinetic model constant have been calculated.

**Key words:** kinetics, oxidation, dehydrogenation, catalysis, isobutyl alcohol, kinetic model

**I.V. DYUMAeva, N.A. EGOROV, N.Ch. MOVSUMZADE**  
**THERMOCHEMICAL REGULARITIES OF NITRILE COMPLEXATION**

Calculations of parameters by means of MNDO method are presented. The entropy, enthalpy and Gibbs energies are presented. On the base of obtained parameters the probable schemes of reactions proceed of amines attachment in the presence of metal salts of transition valency have been discussed.

**Key words:** complexes, nitriles, enthalpy, entropy, amines

**A.G. KASHAEV, A.V. ZIMICHEV**  
**SYNTHESIS OF SUBSTITUTED 2-R-6-R'-4-(1,3,4-OXADIAZOL-2-YL)QUINOLINES AND THEIR VINYLOGOUS SERIES**

Series of 2-R-6-R'-4-(1,3,4-oxadiazol-2-yl)quinolines and 6-R-2-[-2-(2-nitrophenyl)ethenyl]-4-(1,3,4-oxadiazol-2-y)quinolines containing in their structure fragments of biologically active groups have been synthesized.

**Key words:** synthesis, 2-R-6-R'-4-(1,3,4-oxadiazol-2-yl) quinolines, 6-R-2-[-2-(2-nitrophenyl)ethenyl]-4-(1,3,4-oxadiazol-2-y)quinolines

**O.A. ZABYVAEVA, S.V. ALEEVA, S.A. KOKSHAROV**  
**ANALYSIS OF PRODUCTS OF OXIDIZING DESTRUCTION OF COTTON CELLULOSE**  
**AT TREATMENT WITH ALKALINE KIERING SOLUTIONS**

The change of the specific contents of aldehyde and carboxyl groups in the cellulose macromolecules at alkaline kiering of cotton fabric has been estimated. The magnitude of average length of polymer chain ( $L_{CP}$ ) being the share of one end group has been proposed for the characteristic of degree of cellulose damage. At long aerobic keeping of kiering solution containing nonionic penetrating agent the decrease of  $L_{CP}$  value in 2...2.1 times higher of its change without the surfactants addition. The comparison results with data of viscometric determination of polymerization degree allows to assume that polymers on the active internal surface of fibre contacting with kiering solution are undergone to intensive oxidation.

**Key words:** cellulose, alkaline kiering, aldehyde and carboxyl groups, polymerization degree

**I.Sh. KHUSNUTDINOV, A.M. AKHMETZANOV, V.I. GAVRILOV,**  
**P.P. ZABBAROV, A.G. KHANOVA**  
**STUDY OF 1,1-DIETHOXYETHANE AS COMPONENT OF DIESEL FUEL**

The properties of 1,1-diethoxyethane, diesel fuel and rapeseed oil have been studied for purpose of engine fuel obtaining which satisfy to standard requirements.

**Key words:** 1,1-diethoxyethane, diesel fuel, rapeseed oil, bio fuel

**O.V. KAZMINA, V.I. VERESHCHAGIN, A.N. ABIYAKA**  
**INFLUENCE OF MECHANICAL ACTIVATION ON PROCESSES OF INTERACTION**  
**OF FINE-DISPERSED COMPONENTS OF GLASS CHARGE**

The influence of mechanical activation of components of glass charge on its reactionary ability has been considered. By methods of X-ray and IR-spectral analyses have been established that the joint vibromilling of the marshallite with soda is optimal. Application of that method allows obtaining the glassy material at temperatures which do not exceed 850 °C for obtaining the foam glass-crystal materials.

**Key words:** mechanical activation, glass charge, reactionary ability

**S.P. BOBKOV, Yu.V. VOIYTKO**  
**USE OF SYSTEMS OF CELLULAR AUTOMATA FOR MODELING NON-LINEAR PROBLEMS**  
**OF HEAT CONDUCTIVITY**

The paper deals with the problems of application of discrete dynamic models for modeling processes of heat conductivity. The models based on the systems of cellular automata have been shown to be the convenient tool for study of non-linear problems of heat conductivity.

**Key words:** cellular automata, discrete dynamic models, heat conductivity

**A.V. BAZANOV, V.N. BLINICHEV**  
**TEMPERATURE PULSATION OF EVAPORATED SOLUTION IN MODE OF TRANSITION BOILING**

In the given work results of an experimental temperature pulsations research on the surface of evaporation and in steam volume of a laboratory evaporating unit are presented. The study of the major factors influencing on pulsations of temperature in the solution itself, on the interface of phases and in steam-to-gas medium has been carried out.

**Key words:** temperature rippings, reek surface, vapor phase

**A.V. OGURTZOV, A.V. MITROFANOV, V.E. MIZONOV, V.A. OGURTZOV, K. TANNOUS**  
**COMPUTATIONAL AND EXPERIMENTAL INVESTIGATION OF SOLID PARTICLE**  
**DISTRIBUTION IN APPARATUS WITH TWO-DIMENSIONAL FLUIDIZED BED**

A cell model to describe the particle behavior in an upward gas flow taking into account local flow past particles and inter-particle interaction is propose. Computational and experimental particle concentration distributions have been obtained for different gas flow rate of fluidizing agent and mass of loading.

**Key words:** cell model, solid particles, upward gas flow

*M.V. SAKANOVA, A.I. FINAENOV, S.L. ZABUD'KOV, A.V. YAKOVLEV*  
**ELECTRO-CHEMICAL PROCESSES ON METALS AND ON DISPERSIVE GRAFITE  
ELECTRODE IN 48% SOLUTION OF  $\text{Cu}(\text{NO}_3)_2$**

With the purpose to show the opportunity of electrochemical synthesis of graphite intercalation compounds in electrolytes on the base of  $\text{Cu}(\text{NO}_3)_2$  the cathode processes and anode processes have been studied in the 48% solution of copper nitrate. Number of advantages of such kind of synthesis has been revealed.

**Key words:** grafite, cathode, anode, copper intercalation

*V.I. RYAZHSHIKH, M.I. SLYUSAREV, A.A. BOGER, C.V. RYABOV*  
**SEDIMENTATION OF STOKES PARTICLES UNDER THEIR PULSE INPUT THROUGH  
FREE SURFACE OF FLAT LAYER OF MIXING MEDIUM**

On the base of diffusion conceptions about transfer of low concentrated mono dispersive suspensions in gravity field the mathematic model of kinetics of their precipitation in flat layer of homogeneously mixing medium, through free surface of which the Stokes particles enter according to the low of rectangular impulse has been proposed.

**Key words:** model, precipitation, suspension

*A.Yu. MOROZOV, O.N. KARATUN*  
**THERMAL PYROLYSIS OF PETROL FRACTION 62-180 °C OF ASTRAKHAN  
GAS-CONDENSATE DEPOSIT**

The transformation of petrol fraction of the Astrakhan gas-condensate deposit during pyrolysis has been considered at change of various parameters. During experimental researches the optimum parameters for obtaining of various unsaturated hydrocarbons have been established.

**Key words:** thermal process, pyrolysis, olefins, ethylene, propylene

*A.N. PRUSOV, S.M. PRUSOVA, A.E. GOLUBEV, O.N. IVANOVA*  
**DELIGNIFICATION OF SHORT FLAX FIBER**

The lignin content change in flax fiber during cellulose extraction from it by means of oxidative and hydrolytic destruction has been studied.

**Key words:** complexes, nitriles, enthalpy, entropy, amines

*I.Sh. KHUSNUTDINOV, A.M. AKHMETZYANOV, B.I. GAVRILOV,  
P.P. ZABBAROV, A.G. KHANOVA*  
**OPTIMIZATION OF 1,1-DIETHOXYETHANE SYNTHESIS CONDITIONS**

The process of 1,1-diethoxyethane synthesis from the acetaldehyde and the ethanol under various conditions has been studied. Optimal conditions of process for obtaining the maximum yield of target product have been established.

**Key words:** 1,1-diethoxyethane, synthesis, acetaldehyde, ethanol