

A B S T R A C T S

*S.I. FILIMONOV, I.G. ABRAMOV***SYNTHESIS OF CONDENSED HETEROCYCLES OF O- DICARBONITRILES**

The basic methods of synthesis of heterocycles o- dicarbonitriles were considered. Chemical approaches to synthesis of heteroaromatic systems containing phthalonitrile fragment, condensed with 5-, 6-, 7-, 8- members and crown ether heterocycles systems were systematized.

Key words: aromatic nucleophilic replacement, o- dicarbonitriles compound condensed with 5-, 6-, 7-, 8- members and crown ether heterocycles systems

*G.S. SERGEEVA***DI (L-MALATE) BORATES OF ALKALINE METALS AND AMMONIUM**

By interaction of boric acid, L- malic acid (then - malic acid) and alkali or ammonium hydroxide or carbonate (at molar ratio 1:2:1) in aqueous medium the di(L-malate)borates of lithium $\text{Li}[\text{B}(\text{C}_4\text{H}_4\text{O}_5)_2]$; sodium $\text{Na}[\text{B}(\text{C}_4\text{H}_4\text{O}_5)_2]$; potassium $\text{K}[\text{B}(\text{C}_4\text{H}_4\text{O}_5)_2] \cdot \text{H}_2\text{O}$; rubidium $\text{Rb}[\text{B}(\text{C}_4\text{H}_4\text{O}_5)_2] \cdot 2\text{H}_2\text{O}$; ammonium $\text{NH}_4[\text{B}(\text{C}_4\text{H}_4\text{O}_5)_2]$ were synthesized. Using the methods of thermal analysis, IR absorption spectroscopy, conductometry and cryoscopy, the physico-chemical properties of compounds were studied.

Key words: complex compounds, borium, oxy acids, L-malic acid, alkali metal salts, synthesis, thermal analysis, infrared spectroscopy, cryoscopies, conductivity, structure

*K.S. RODYGIN, Yu.V. KRYMSKAYA, S.A. RUBTSOVA, A.V. KUCHIN***USAGE OF NEW AZOMETINES ON BASE OF 2-AMINO-1-(4-NITROPHENYL)PROPAN-1,3-DIOL IN ASYMMETRIC SULFOXIDATION**

The asymmetric sulfoxidation of 2-(benzylsulfanyl)-1H-benzimidazole, phenylphenacylsulfide and 1-phenyl-5-methylthiotetrazole in catalytic conditions at presence of new salicylaldehydes on the base of 2-amino-1-(4-nitrophenyl)propan-1,3-diol was studied. Dependence of reaction enantioselectivity on a nature of substituents in aromatic ring of ligands was found out.

Key words: Schiff bases, asymmetric sulfoxidation

*S.S. ROZHKOVA, K.L. OVCHINNIKOV, A.M. KURMANOV, A.V. KOLOBOV, E.R. KOFANOV***TRAKING EFFECT FOR NITRATION OF AROMATIC SINGLE- NUCLEAR SUBSTRATES**

The effect of different substituents in aromatic ring on the nitration reaction of substrates with one aromatic ring was considered. The traking effect was shown to appear for substrates with carboxymethyl group removed from the aromatic ring in the 2 atoms.

Key words: nitration, electrophilic aromatic substitution, traking effect

*Yu.B. RUMYANTSEVA, E.A. KURGANOVA, G.N. KOSHEL, A.A. IVANOVA, V.V. KHRENOVA***CYMENES SYNTHESIS WITH TOLUENE ALKYLATION BY ISOPROPYL ALCOHOL**

A cymene containing (% wt.) 45-50 meta, 30-32 para and 20-23 ortho isomers was obtained by alkylation of toluene with isopropyl alcohol in the presence of concentrated sulfuric acid at the temperature of 10-20 °C with the yield of 90-95% on the reacted toluene.

Key words: alkylation, isomer, cymene, toluene, isopropyl alcohol

*E.E. FROLOVA, A.V. ZELEPUKIN, A.F. BETNEV, S.V. KRASNIKOV, T.A. OBUKHOVA***SYNTHESIS OF p-ACYL-SUBSTITUTED AROMATIC CARBOXYLIC ACIDS USING LIQUID-PHASE CATALYTIC OXIDATION OF p-ACYL-SUBSTITUTED TOLUENES BY OXYGEN**

The method of synthesis of p-acyl-substituted benzoic acids based on liquid-phase oxidation reactions of p-acyl-substituted toluenes was developed. The conditions providing a high yield of target products were chosen. The structure of the compounds obtained was proved by means of IR and NMR spectroscopy.

Key words: liquid-phase oxidation, p-acyl-substituted toluenes, p-acyl-substituted benzoic acids

E.S. IL'INYKH, A.L. FROLOV, D.G. KIM

STUDY ON IODOCYCLIZATION OF 4-ALLYL-5-METHYL-1,2,4-TRIAZOLE-3-THIONE

The iodocyclization of 4-allyl-5-methyl-1,2,4-triazole-3-thione proceeds with a formation of mixture of two compounds – [1,3]thiazolo[2,3-c][1,2,4]triazolium and [1,2,4]triazolo[3,4-b][1,3]thiazinium derivatives which are transformed by means of dihydrothiazine-thiazoline rearrangement in solutions.

Key words: 4-allyl-5-methyl-1,2,4-triazole-3-thione, iodocyclization, 5,6-dihydro-6-iodomethyl-3-methyl-1H-[1,3]thiazolo[2,3-c][1,2,4]triazolium iodide, 6,7-dihydro-6-iodo-3-methyl-1H,5H-[1,2,4]triazolo[3,4-b][1,3]thiazinium iodide, dihydrothiazine-thiazoline rearrangement, thiiranium ion

*V.B. LYSKOV, O.V. DOBROKHOTOV, S.I. FILIMONOV, I.G. ABRAMOV, V.S. SHARUNOV,
A.S. DANILOVA*

SYNTHESIS OF 4-(AZACYCLOALKYL) PHTALONITRILES IN PRESENCE OF METAL COMPLEX CATALYSTS

The new method of synthesis of 4-azacycloalkyl-substituted phthalonitriles was developed. The reaction of the 4-brominephthalonitrile with various amines in the presence of copper complex catalysts was researched. New 4-azaalkylencyclosubstituted phthalonitriles were obtained and characterized.

Key words: 4-(azacycloalkyl) phthalonitriles, 4-brominephthalonitrile, nucleophilic substitution, L-proline, α, α' -bipyridil, [1,10]phenanthroline, complex catalyst

*K.L. OVCHINNIKOV, M.S. CHERKALIN, A.M. KURMANOV, YA.V. SADOVNIKOVA,
A.V. KOLOBOV, E.R. KOFANOV*

INTERACTION OF 6-ARYL-4,5-DIHYDROPYRIDAZIN-3(2H)-ONES WITH MOLECULAR BROMINE. REACTION PECULARITIES, MECHANISM

The reaction of dehydration of 6-aryl-4,5-dihydropyridazin-3(2H)-ones under the bromine action was studied. The reaction was shown to proceed through the formation of enamine form of substrate. The reaction mechanism was proposed.

Key words: dehydrogenation, quantum-chemical calculations, enol, enamine

K.A. KULIYEV

SPECTROPHOTOMETRIC STUDY OF VANADIUM DIFFERENT LIGANDS COMPLEXES WITH 2,4-DITHIOL-4-TRETBUTYL-PHENOL AND HYDROPHOBIC AMINS

Vanadium (II, IV, V) complexes of different ligands with 2,4-dithiol-4-tretbutyl-phenol and hydrophobic amines were studied with spectrophotometrically. The diphenylamine and threephenylamine were used as a hydrophobic amine. The maximal extraction degree of different ligands compounds was observed at pH of 1.4-5.2. Optimal conditions for formation and extraction of different ligands compounds were found and components ratios for complexes were established. Methods for extraction-spectrophotometrical determination of vanadium in soil were developed.

Key words: spectrophotometric study, photometric method, redox reactions

V.F. BABANIN, P.A. IVANOV, N.V. MIKHALEVA

MAGNETOCHEMICAL DIAGNOSTICS OF IRON STATES IN ANTIANAEMIA MEDICINAL PREPARATIONS AND PLANTS

The iron state in synthetic and natural medicinal preparations was investigated by methods of magnetometry and Mossbauer spectroscopy. As the auxiliary method the roentgen diffractometry was used. It was established that: 1). Most stable among synthetic medicinal preparations during storage was sulfate of iron, haemostimuline and ferramide; 2). Antianaemia medicinal plants accumulate the iron in form of three valent ions. They are aggregated in nanosize clusters of hydroxide – core of albumen ferritine which accumulates the iron.

Key words: magnetochemistry, Mossbauer spectroscopy, magnetic measurements, ferritine

S.A. PIVOVARENOK, A.V. DUNAEV, D.B. MURIN, A.M. EFREMOV, V.I. SVETTSOV

ELECTROPHYSICAL PARAMETERS AND EMISSION SPECTRA OF GLOW DISCHARGE IN HCL

The analysis of electrophysical parameters and the plasma HCl emission spectrum in dc glow discharge were carried out. The data on the temperature of the gas and reduced electric field were obtained. The radiation

intensities of Cl₂, Cl and H were shown to be proportional in the first approximation to the concentrations of these particles in plasma.

Key words: plasma, radiation, intensity, excitation, concentration, hydrogen chloride

V.V. ZHYLINSKIY, V.B. DROZDOVICH, I.M. ZHARSKIY

GALVANO-PLASMA SYNTHESIS AND HYDROGEN ADSORPTION PROPERTIES OF NANOSIZE CARBON MATERIALS

The realization conditions of galvano-plasmic synthesis of carbon nanosize materials at atmospheric pressure in sulfuric acid electrolyte were established using as a precursor a graphite anode. The composition and morphology of synthesized carbon nanosize materials was investigated by infrared and Raman spectroscopy, X-ray diffraction analysis, scanning electronic microscopy with chemical energy-dispersive X-ray analysis. The specific discharging capacity, diffusion factor of hydrogen into the carbon nanosize materials was determined from results of carrying out charging-discharging cycles in 0.5 M H₂SO₄.

Key words: carbon nanosize materials, galvano-plasmic synthesis, arc discharge, diffusion factor of hydrogen, specific discharge capacity

O.A. GOLUBCHIKOV, A.V. LARIONOV, S.A. LILIN

CATHODE DEPOSITION OF IRON-CONTAINING POWDERS FROM WATER AND WATER-ISOPROPANOL SOLUTIONS OF IRON SULFATES

Iron-containing powders consisting of agglomerated nano- and micro-size particles were obtained by the method of cathode deposition from water and water – isopropanol iron sulfate solutions when metal deposition is carried out at the current density above maximum. The average size of the particles was reduced at transition from iron sulfate water solution to water-isopropanol one and the fraction of nano-size particles was increased from ~ 10% up to 50%.

Key words: cathodic deposition, nano-size powders, water-isopropanol solutions

A.S. KOLCHENKO, A.I. FINAENOV, S.L. ZABUD'KOV, A.V. AFONINA

EFFECT OF FRACTIONAL COMPOSITION OF DISPERSED GRAPHITE ON KINETICS OF FORMATION AND PROPERTIES OF INTERSTITIAL PHASES IN SULFURIC ACID

The effect of granulometric composition of dispersed graphite on the kinetics of anodic formation of thermo-expanding compounds in concentrated sulfuric acid was studied. Dependencies of properties of the synthesized compounds on the grain size of the initial graphite were shown.

Key words: intercalated compounds of graphite, thermo-expanded graphite, granulometric composition

N.V. DVORETSKIY, L.G. ANIKANOVA

STABILITY OF POTASSIUM AND CESIUM POLYFERRITES

The dynamics of alkali metal loss was studied with potassium, cesium and mixed potassium-cesium polyferrites of β -alumina structure. Basic principles of fast analysis of polyferrites stability to the action of catalyst poisons were developed. The method of increasing stability of polyferrite phase was offered.

Key words: cesium monoferrite, cesium polyferrite, phase composition, cationic conductivity, catalyst stability, catalyst poison

I.K. GARKUSNIN, E.O. IGNATIEVA, E.M. DVORYANOVA

PHASE EQUILIBRIA IN TERNARY SYSTEM K₂MoO₄-KF-KI

The three-component system has been examined by the differential thermal analysis. As a result the melting point temperature, compositions and enthalpies of melting ternary eutectic mixtures have been determined. The non and mono variant equilibria have been described.

Key words: phase equilibria, T-x-diagram, differential thermal analysis

I.A. GRITSKOVA, P.N. CHADAEV, D.I. SHRAGIN, E.N. LEVSHENKO, L.A. ZLYDNEVA, E.V. VOLKOVA, N.V. RASSOKHA

METHYLMETHACRYLATE POLYMERIZATION IN PRESENCE OF SILICON-ORGANIC SURFACTANTS

This article provides data on the kinetics of polymerization of methylmethacrylate in the presence of silicon-organic surfactant, ((α , ω)-bis [10-carboxydecil] polydimethylsiloxane). It was shown that under its presence it is possible to synthesize the stable polymer suspension with particle size narrow distribution.

Key words: heterophase polymerization, conversion, silicon-organic compound, methylmethacrylate, particle size distribution, antistatic protection, photofilms

D.A. KAZAKOV, V.V. VOLKHIN, I.S. BOROVKOVA

PREDICTION OF GAS-TRANSPORT ABILITY OF DISPERSED ORGANIC PHASES AT OXYGEN MASS TRANSFER TO WATER-ORGANIC EMULSIONS

The forecast method of gas-transport ability of dispersed organic phases with respects to an oxygen mass transfer to emulsion on the base of data on its physicochemical properties and correlation dependences was proposed.

Key words: mass transfer, oxygen, water-organic emulsion

Ya.O. MEZHUEV, Yu.V. KORSHAK, M.I. SHTIL'MAN, A.A. KOLEDENKOV, M.S. USTINOVA
KINETICS AND ACTIVATION PARAMETERS OF DIRECT ELECTRON TRANSFER AT ANILINE OXYDATIVE POLYMERIZATION

Some kinetic results for aniline oxidation polymerization were considered in water medium based on experimental dependencies of reacting system pH data on time obtained for three various temperatures. Rate constants for direct single-electron transfer from aniline molecule to oxidant and activation parameters of the reaction were calculated.

Key words: polyaniline, kinetic, oxidation

E.P. KONSTANTINOVA, P.V. NIKOLAEV, N.V. LAPTEVA, Yu.Yu. BARABANSHCHIKOVA
ACTIVE SOLVENTS IN SYNTHESIS OF OLIGOETHERACRYLATE DERIVATIVES OF EPOXY OLIGOMERS AND INORGANIC ACIDS

The reasonability of the synthesis of oligoetheracrylate derivatives of epoxy oligomers and inorganic acids was shown in the medium of nucleophilic solvents and solvents- reagents. The rheological kinetics of cyclohexanone condensation in the medium of phosphoric acid was studied. Products of condensation such as dimer, trimer and film-forming oligomers were isolated. The structure of aldol-crotonic cyclohexanone condensation products was established with the IR-spectroscopy, UV-spectroscopy and chromatography-mass spectrometry.

Key words: epoxy oligomer, cyclohexanone, condensation, orthophosphoric acid, oligoetheracrylates

G.I. KOSTRYKINA, M.A. KOKOREVA, M.V. TSVETKOV
MODIFICATION OF NATURAL RUBBER WITH SILANE

The natural rubber modification with various structure silanes was studied at mixing on roll and viscoelastic properties of mixtures were determined. At mechanical treatment in air silanes were shown to attach to polymer forming insoluble gel fraction and reducing molecular weight sol fraction. As the result of these reactions the accumulation modulus and loss modulus were changed. The level of change determines with a structure of silane. Heating up to 180 °C results in the decrease of modulus of natural rubber that is connected with its destruction. The modified rubbers have the greater stability to ageing.

Key words: natural rubber, silane, modification, viscoelastic properties

N.Ch. MOVSUM-ZADE

QUANTUM-CHEMICAL CALCULATION OF CYANO-CONTAINING NORBORNEONES

The structure of some norbornenes on the base of cyclopentadienes and nitriles which are presented with acrylo-nitrile at its derivatives is given on the base of quantum chemistry method. The calculations allow to obtain the parameters of cyano-containing norbornenes.

Key words: norbornenes, nitril-substituted norbornenes, quantum – chemical calculations, parameters of cyano-containing norbornenes

A.R. MURZAKOVA, A.D. BADIKOVA, F.Kh. KUDASHEVA, R.N. GIMAEV
POSSIBILITY OF UTILIZATION OF SPENT SULFURIC ACID OF SULFUR ACID ALKYLATION UNIT WITH PRODUCING AMMONIUM SULFATE

The method of utilization of spent sulfuric acid, sulfuric of process of sulfur acid alkylation of isoalkanes with olefins was proposed for producing a mineral fertilizer - ammonium sulphate. Organic impurities of spent sulfuric acid were extracted with the technical ethyl alcohol.

Key words: spent sulfuric acid, alkylation, ammonium sulfate, extraction

T.N. SHAKHTAKHTINSKIY, A.D. EFENDI, I.S. IBRAGIMOV, I.G. MELIKOVA,
T.T. YARMAMEDOV, Z.A. ZAIYTSEVA

JOINT CATALYTIC OXIDATION OF HYDROCARBONS C₁-C₄ WITH CARBON MONOXIDE

The joint oxidation of hydrocarbons C₁-C₄ with CO was carried out in the presence of catalytic systems on the base of V, P, Cu, Cr, Zn oxides which do not contain noble metals. At relatively low temperatures - T=613-653 K, feed rate of raw material of V=10000 h⁻¹ and the ratio of CO:O₂:H₂O:CO₂:C_xH_y=1:20:5:10:6 the CO conversion was shown to be 98-100% and the conversion of C₁-C₄ hydrocarbons to be 94-96%.

Key words: aromatic hydrocarbons, oxidation, conversion, catalytic systems, organochlorine products

A.A. KOLESNIKOV, A.E. DROGUN

INVESTIGATION OF RADIATION-CHEMICAL VULCANIZATION OF ELASTOMER MIXTURES

The radiation cross-linking of some elastomers mixtures was considered in the presence of polyfunctional unsaturated acrylic compounds. The selection of acrylic compounds and their concentrations in the elastomeric composition in small doses of irradiation was shown can obtain vulcanizates with high performance properties.

Key words: rubbers, vulcanization, radiation chemistry, unsaturated acrylic compounds

E.S. SLIVCHENKO, A.P. SAMARSKIY, V.N. ISAEV, N.A. SUPRUNOV

THEORETICAL ANALYSIS OF STABILITY OF CONTINUOUS OPERATION CRYSTALLIZER

The method for stability estimation of the complete mixing cell of continuous operation crystallizer was developed. Numerical experiments confirmed the applicability of this technique for different models of the kinetics of formation and growth of crystals.

Key words: crystallization system, complete mixing cell, rate of crystals formation, rate of crystals growth, supersaturation, oscillation, stability

V.P. ROMANOV, A.V. VETYUGOV, A.V. BOGORODSKIY, P.P. GUYUMDZHAN, V.N. BLINICHEV
CALCULATION OF TENSION VALUES IN LAYER OF MATERIAL BEING MILLED IN A ROLLER-PLATE TYPE MILL WITH IRREGULAR MOVING ROLLERS

In given article the equation for determination of equivalent tension in the layer of bulk material being milled in a roller-plate mill with irregular moving rollers has been obtained. Calculation dependences allowing determining values of main factors affecting on the grinder's performance are presented.

Key words: milling, powders, tension, shift deformations

A.A. RZHEVSKIY, A.S. VLASOV, E.M. ALOV, N.P. GERASIMOVA, O.S. KOZLOVA, A.S. DANILOVA
SYNTHESIS OF NEW 1,2,4-TRIAZOLINETHIONE-3 DERIVATIVES

New derivatives of 5-substituted-1,2,4-triazolinethiones-3 containing fragments of arenesulfonyl(thio) carboxylic acid, were obtained by their S-alkylation in alkaline medium.

Key words: triazolinethione-3, S-alkylation, triazole, arenesulfonyl (thio) carboxylic acids

T.V. FROLOVA, D.G. KIM

INTERACTION OF S-ALLYL DERIVATIVES OF 2-THIOURACILS WITH BROMINE

The interaction of bromine with 2-allylthio-6-methyl-4(3H)-pyrimidinone was found to proceed the bromocyclization and electrophilic substitution to pyrimidine ring. But reaction with 2-allylthio-5-ethyl-6-methyl-4(3H)-pyrimidinone leads to thiazolo[3,2-a]pyrimidinium systems.

Key words: 2-allylthio-4(3H)-pyrimidinones, thiazolo[3,2-a]pyrimidin-7-ones, bromocyclization, electrophilic aromatic substitution

G.M. POLTORATSKIY, A.N. EVDOKIMOV, V.S. GOLIKOVA, A.V. KURZIN
ALCOHOLYSIS OF POTASSIUM CYANIDE

The solubility of potassium cyanide in methanol and glycerol taking into account a formation of appropriate potassium alcoholate was determined.

Key words: potassium cyanide, methanol, glycerol, alcoholates, solubility

S.L. ZAKHAROV, A.V. EFREMOV
RESEARCH OF SELECTIVE POROSITY OF MEMBRANES WITH RIGID STRUCTURE

The probabilistic approach for an estimation of porosity of nanofiltration and reverse osmosis membranes was developed. A distribution of transport pores on sizes in membranes on the base of porous glass was obtained experimentally. The offered theoretical functions describe experimental data with a good accuracy.

Key words: reverse osmosis, nanofiltration, nanoporous membrane, porous structure

B.Yu. GAMATAEVA, B.S. ALIKHADZHIEVA, D.Z. MAGLAEV, A.M. GASANALIEV
PHASE FORMATION IN $\text{Na}_2\text{WO}_4\text{-V}_2\text{O}_5$ SYSTEM

For the first time, the processes of phase formation in $\text{Na}_2\text{WO}_4\text{-V}_2\text{O}_5$ were studied with the methods of visual polythermic, differential thermic (DTA) and radiographic phase (RPA) analyses. Parameters of non-variant points (NVPs) were revealed and the system phase diagram was built. The formation of two new binary compounds $\text{Na}_4\text{W}_2\text{V}_6\text{O}_{23}$ and $\text{Na}_8\text{W}_4\text{V}_2\text{O}_{21}$ was discovered.

Key words: phase formation, phase diagram, $\text{Na}_2\text{WO}_4\text{-V}_2\text{O}_5$ system