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A B S T R A C T S

*O.A. PETROV, G.V. OSIPOVA***ACIDIC PROPERTIES OF β -SUBSTITUTED TETRAAZAPORPHYRINS**

In given review the analysis of change of the acidic properties of β -substituted tetraazaporphyrins at their interaction with cyclic as well as primary, secondary and tertiary acyclic nitrogen containing bases in benzene and dimethylsulfoxide was carried out. The influence of dielectric permeability of the solvent as well as the nature of the base and substituents in tetraazaporphyrin macrocycle on the rate and activation parameters of the acid-basic interaction was established. Questions of a structure and stability of complexes with the proton transfer of tetraazaporphyrins were discussed.

Key words: tetraazaporphyrins, acidic properties, acid-basic interaction, kinetics, reactivity, proton transfer, nitrogen containing bases

*V.E. MAIYZLISH, I.G. ABRAMOV, A.V. SHALINA, A.V. RODIONOV, A.B. BORISOV, E.L. KUZMINA, V.V. ALEKSANDRIYSKIY, O.A. PETROV, G.P. SHAPOSHNIKOV***4-TERT-BUTYL-5-NITROPHthalONITRILE**

The 4-*tert*-butyl-5-nitrophthalonitrile were synthesised by nitrating mixture of 4-*tert*-butylphthalimide the amidization of which with the concentrated water solution of ammonia in the presence of ammonium chloride followed by dehydration of appropriate diamide by phosphorus oxychloride in DMF the 4-*tert*-butyl-5-nitrophthalonitrile was isolated. The identification of the target compound was carried out using the data of the elemental analysis, combined chromatography and mass spectrometry equipment, as well as the liquid chromatography, ^1H and ^{13}C NMR, IR-spectroscopy.

Key words: nitration, *tert*-butylphthalimide, 4-*tert*-butyl-5-nitrophthalonitrile, NMR spectra, quantum-chemical calculation, combined chromatography and mass spectrometry

*V.V. CHAPURKIN, A.O. LITINSKIY, V.N. PERMINOV, S.V. CHAPURKIN***PECULIARITIES OF INTERACTION OF DIMETHYL ESTER OF PERFLUORODODECANEDICARBOXYLIC ACID AND ALKYLKETONES**

Peculiarities of the polyfluorinated tetraketones synthesis by reaction between dimethyl ester of perfluorododecanedicarboxylic acid and alkylketones were studied. Based on the results of ab initio MP2/6-31G*calculations of process steps the details of the reaction mechanism were discussed

Key words: fluorine-containing tetraketones, perfluorodicarboxylic acids, non-empirical quantum-chemical calculation schemes

*T.V. LEVENETS, V.O. KOZMINYKH, E.N. KOZMINYKH***SYNTHESIS AND STRUCTURE OF 3-ARYLHYDRAZONO-2,4-DIOXOALKANOATES**

Ethyl 3-arylhydrazono-2,4-dioxopentanoates were obtained by condensation of alkyl methyl ketones with diethyl oxalate in the presence of sodium hydride followed by the action of aryl diazonium salts. Structure peculiarities of the synthesized compounds were established with the help of spectral methods of analysis (IR, NMR spectroscopy, chromat-mass-spectrometry and X-Ray diffraction).

Key words: «one-pot» three-component condensation, azo coupling, 3-arylhydrazono-2,4-dioxoalkanoates, IR, NMR spectroscopy, gas chromatography-mass spectrometry, X-ray diffraction

V.A. IONOVA, S.I. TEMIRBULATOVA, A.V. VELIKORODOV, O.L. TITOVA, D.A. TIKHONOV
SYNTHESIS OF NEW AZAHETEROCYCLIC COMPOUNDS WITH PHENYL CARBAMATE FRAGMENT ON BASE OF METHYL-N-(4-ACETYLPHENYL) CARBAMATE

By condensation of methyl-N-(4-acetylphenyl)carbamate, anhydrous AcONH_4 , 2(4)-hydroxybenzaldehydes with ethylcyanoacetate and malononitrile in 1-butanol the methyl N-[[5-cyano-4-(2(4)-

hydroxyphenyl)-6-oxo-1,6-dihydro-2-pyridinyl]phenyl}carbamates and methyl N-{{[5-cyano-4-(2-hydroxyphenyl)-6-imino-1,6-dihydro-2-pyridinyl]phenyl}carbamate were obtained. By boiling the methyl-N-(4-acetylphenyl)carbamate with tosylhydrazide in ethanol the methylN-[4-(1-{2-[(4-methylphenyl)sulfonyl]hydrazono}ethyl)phenyl]carbamate was obtained the condensation of which with 2-mercaptoacetic acid in dioxane in the presence of $ZnCl_2$ results in formation of methyl{4-[2-methyl-3-(4-methylphenylsulfonamido)-4-oxo-thiazolidin-2-yl]phenyl}carbamate. The structure of new compounds was confirmed by IR, 1H NMR spectra.

Key words: methyl-N-(4-acetylphenyl) carbamate, condensation reactions, dihydropyridine, 4-oxo-thiazolidine derivatives

*O.V. KHABAROVA, M.S. DANILOVA, V.V. ELINA, R.R. KUSHEGALIEVA,
A.V. VELIKORODOV, A.G. TYRKOV*

TETRACYCLINE DETERMINATION BY REACTION WITH MOLYBDENUM AND LUMOGALLIONE

An optimal medium for the formation of molybdenum - lumogallione - tetracycline complex was established to be slightly acid solutions (pH=5). The maximum yield of the complex in system is observed at 1:2:2 molar ratios. The equation for the calibrating dependence for tetracycline determination is $y_i = [(0,213 \pm 0,006) + (0,017 \pm 0,003)x_i]$.

Key words: tetracycline, molybdenum, lumogallione, complexation, antibiotics, pharmaceutical analysis

V.A. GOLUBEV, M.Yu. NIKIFOROV, G.A. ALPER, I.A. KHODOV

POSSIBILITIES OF ASL MODEL AND SEMI EMPIRICAL MODELS FOR CALCULATION OF PHASE EQUILIBRIA IN BINARY AND TERNARY SYSTEMS

A comparative analysis of possibilities of models of associated solutions ASL (Associated Solution + Lattice) and UNIQUAC (associated solution models) as well as semi empirical Wilson model, NRTL, UNIQUAC ones was carried out as regards their capabilities to describe phase equilibria in binary and ternary systems. The models taking into account the molecular association was shown to give significantly better results under calculating vapour pressure for associated solutions as compared to the UNIQUAC model. For ternary systems the use of the ASL model gives approximately the same results as in the case of semi empirical Wilson model and the UNIQUAC model, whereas for the NRTL model the agreement with experiment is far worse.

Key words: phase equilibria, molecular association, semi-empirical model of non-electrolytes solutions, binary and ternary systems

E.A. NOGOVITSYN, A.L. KOLESNIKOV, Yu.A. BUDKOV

THERMODYNAMIC AND STRUCTURAL PROPERTIES OF AQUEOUS SOLUTIONS OF GLYCOSAMINOGLYCANS IN SELF-CONSISTENT FIELD APPROXIMATION

In this paper the behavior of the polymer chains of chondroitin sulfate and hyaluronic acid in aqueous solutions with NaCl and $CaCl_2$ salt additions was compared. The analytical expression for the equation of state was obtained in the self-consistent field approximation. This equation approximates well the experimental data on the osmotic pressure. Based on the criterion of Manning the conclusion was made that there is the effect of counterion condensation in solutions of chondroitin sulfate and its lack in solutions of hyaluronic acid.

Key words: chondroitin sulfate, hyaluronic acid, aqueous solution, self-consistent field, osmotic pressure

A.V. NOSKOV, O.V. ALEKSEEVA, A.S. KRAEV, A.V. AGAFONOV

DIELECTRIC SPECTROSCOPY OF POLYSTYRENE FILMS MODIFIED BY FULLERENES

Modification of polystyrene was carried out by small additions of fullerenes (up to 1 wt. % of C_{60}), and the electrical properties of the composite films were studied. Based on the results of measurements of capacitance and dielectric loss tangent it can be concluded that the fullerene-polystyrene composites studied are non-polar. We revealed that dependence of the dielectric constant on the film composition is nonmonotonic with a minimum if there is 0.035 wt. % of C_{60} . The doping polystyrene with small amounts of fullerenes was found to result in neither an appreciable increase in the static conductivity or occurrence of the dielectric relaxation processes.

Key words: polystyrene, fullerenes, dielectric permittivity, dielectric loss, conductivity

A.V. AFINEEVSKIY, D.A. PROZOROV, M.V. LUKIN, M.V. ULITIN

EFFECT OF METHANOL ADDITIVES ON THERMOCHEMICAL CHARACTERISTICS OF HYDROGEN ADSORPTION ON PARTIALLY DEACTIVATED SKELETAL NICKEL FROM SODIUM HYDROXIDE - WATER SOLUTION

The heat of adsorption and the maximum amount of adsorbed hydrogen on a partially deactivated Raney nickel catalyst from a solution of sodium hydroxide-water with the addition of methanol was determined by adsorption-calorimetric method. The introduction into solution of methyl alcohol additive was shown can significantly shift the adsorption equilibrium on the surface of the deactivated catalyst towards individual forms of weakly bounded hydrogen.

Key words: catalytic activity, catalyst poisons, adsorption, hydrogen adsorption heat

A.V. BARBOV, D.A. PROZOROV, A.A. MERKIN, M.V. ULITIN

HEAT OF HYDROGEN SORPTION ON DEPOSITED PALLADIUM CATALYSTS

With the adsorption-calorimetric method the heats of hydrogen sorption and the maximum amount of sorbed hydrogen were determined for the palladium catalyst with a carbon substrate from a 0.01 N aqueous sodium hydroxide at a temperature of 303K. Heats of hydrogen sorption on the active surface of the catalyst depending on the degree of filling the catalyst were calculated.

Key words: palladium catalyst on a carbon substrate, hydrogen sorption, heats and values of hydrogen sorption, liquid-phase hydrogenation

M.S. FEDOROV, N.I. GIRICHEVA, S.N. IVANOV, G.V. GIRICHEV

MASS SPECTROMETRIC STUDY OF VAPORIZATION PROCESSES OF METHYL ESTERS AND HYDRAZIDES OF BENZENE AND NITROBENZENESULPHONIC ACIDS

The saturated vapors of 2- and 4-nitrobenzenesulphonic acid methyl esters were established by means of mass spectrometry to consist of corresponding monomeric molecular species. These compounds are thermally stable at heating in vacuum, at least, up to the temperatures of 380 and 376 K, respectively. The schemes of processes of fragmentation of molecules under electronic ionization action were offered. Benzenesulphonic acid hydrazide and 4-nitrobenzenesulphonic acid hydrazide decompose at heating. Introducing the electron-acceptor substitute NO₂ results in the decrease of thermal stability of hydrazide.

Key words: mass spectrum, 2-nitrobenzenesulphonic acid methyl ester, 4-nitrobenzenesulphonic acid methyl ester, benzenesulphonic acid hydrazide, 4-nitrobenzenesulphonic acid hydrazide

A.I. LYTKIN, V.E. LITVINENKO, O.N. KRUTOVA

FORMATION OF COORDINATION COMPOUNDS OF IONS CADMIUM, ZINC, NICKEL AND COBALT WITH DIETHYLENTRIAMINE-N, N, N', N'', N'''-PENTAACETIC ACID IN AQUEOUS SOLUTION

By potentiometric titration method at 298.15K and ionic strength of 0.2; 0.5; 1.0 (KNO₃) the composition and stability of coordination compounds of zinc, nickel and cobalt with diethylenetriamine-N, N, N', N'', N'''-pentaacetic acid in aqueous solution was determined. The results were compared with literature data. The Ni²⁺ ions were found to form with diethylenetriamine-N, N, N', N'', N'''-pentaacetic acid complexes more stable than the ions Zn²⁺ which corresponds to the conventional Irving-Williams series

Key words: diethylenetriaminepentaacetic acid, stability constants, coordination compounds, complexon, solutions

A.M. GASANALIEV, P.A. AKHMEDOVA, B.Yu. GAMATAEVA, P.A. KHIZRIEVA

TOPOLOGY AND PHASE COMPLEX OF SYSTEM K, CA, BA/F, WO₄. THERMAL ANALYSIS OF K₂WO₄-BaF₂-CaF₂ SYSTEM

With use of a program complex «Differentiation of multicomponent systems on the COMPUTER» taking into account the revealed internal secant the differentiation was carried out for fourfold mutual system K, Ca, Ba/F, WO₄ in the course of which its stable phase complexes were revealed. For the first time, with the complex of methods of the physical and chemical analysis: differential-thermal (DTA), visually-polithermal (VPA), X-ray (RFA) and projectively-thermographic ones the three-component system K₂WO₄-BaF₂-CaF₂ which is stable secant complex of given fourfold mutual system was studied. Temperatures and coordinates of non-variant points were determined.

Key words: differentiation, stable and metastable complex, phase single block, stable secant complex, a priori forecast, thermal analysis

E.V. RUMYANTSEV, S.N. ALYOSHIN
**HYDROLYSIS AND DESTRUCTION OF BORON- FLUORIDE COMPLEX
OF DIPYRROLYLMETHENE IN ALKALINE SOLUTIONS**

The Bodipy kinetic stability in alkaline aqueous solutions was investigated. Bodipy destruction rate is increased with rising pH of solution. The first step of destructive decay is the alkaline hydrolysis of complex coordination center. The next step is the decay of the anion ligand to monopyrrolic products.

Key words: boron- fluoride complex, alkaline solutions, dipyrrolylmethene, kinetics, hydrolysis, destruction

V.P. ARKHIPOV, Z.Sh. IDIYATULLIN
**SIZES OF MICELLES IN SODIUM DODECYLSULFATE AQUEOUS SOLUTIONS IN PRESENCE
OF 2-PROPANOL AND DISTRIBUTION OF WATER AND 2-PROPANOL MOLECULES
BETWEEN MICELLAR AND AQUEOUS PHASES**

On results of the self-diffusion coefficients measurements in the water-2-propanol sodium dodecylsulfate solutions in the frame the two state model the distribution of water and 2-propanol molecules between free (inter-micellar) and bounded (intra-micellar) states was estimated. The sizes of micelles were calculated.

Key words: diffusion, micelles, sodium dodecyl sulfate, 2-propanol

Yu.V. RUMYANTSEVA, R.E. KUZNETSOV, A.N. MUDROV, O.I. KOIFMAN
**RADICAL COPOLYMERIZATION OF VINYLPIRROLIDONE AND METHYLMETHACRYLATE
IN TOLUENE UNDER MICROWAVE RADIATION**

For the first time, the results obtained on the copolymerization of vinylpyrrolidone with methylmethacrylate in toluene under microwave radiation (MWI) at the initiation with dinitrile of azoizobutyric acid is presented. A comparative analysis of vinylpyrrolidone copolymers obtaining with methylmethacrylate in MWI and convection heating was carried out. It was established that there is a tendency to reducing the rate of growth of polymer chain and conversion with the increasing MMA monomer content in the initial monomer mixture at MWI and at convection heating. The values of relative activities in process under study were the follows: in MWI $r(VP) = 0.04$; $r(MMA) = 1.58$, the thermal heating $r(VP) = 0.05$; $r(MMA) = 1.37$.

Key words: polymers, vinylpyrrolidone, methylmethacrylate, synthesis, microwave irradiation, molecular mass, kinetics, radical polymerization, copolymerization constants

A.E. PETROV, V.A. TITOV, S.A. SMIRNOV
CONCENTRATION OF OXYGEN ATOMS IN ATMOSPHERIC PRESSURE AIR GLOW DISCHARGE

Concentration of $O(^3P)$ atoms was estimated in atmospheric pressure air glow discharge at discharge current of 9-35 mA using intensities of emission line for $O(3p^3P \rightarrow 3s^3S)$ transition and band for $N_2(C^3\Pi_u, v'=0 \rightarrow B^3\Pi_g, v''=2)$ transition.

Key words: plasma, gas discharge, air, atomic oxygen, kinetics

M.G. IGLENKOVA, A.A. RODINA, V.A. RESHETOV, S.B. ROMADENKINA
**DEPENDENCE STUDY OF COMPRESSIVE STRENGTH ON HEAT-TREATMENT
TEMPERATURE, CONCENTRATION OF CHEMICAL ADDITIVES AND CONDITIONS
OF COMPOSITE MOLDING ON BASE OF PHOSPHOGYPSUM**

The dependences of compressive strength on heat-treatment temperature (60, 110, 180, 230, 340, 700 and 1000 °C), chemical additives (MgO, CaO, SrO, BaO) and conditions of molding (35-70 MPa) of objects were studied. The conditions for production of composites on the base of phosphogypsum with highest operating abilities were found.

Key words: phosphogypsum, composite materials, heat treatment, pressing, conditioning

V.V. ALEXANDRIYSKIY, S.A. KUVSHINOVA, I.V. NOVIKOV, V.A. BURMISTROV
**INFLUENCE OF 4-(ω)-HYDROXYALKOXY-4-CYANOBIPHENILS ON MESOMORPHIC,
DIELECTRIC AND OPTICAL PROPERTIES OF LIQUID CRYSTALLINE MIXTURE LC-807**

The temperature and concentration dependences of birefringence and dielectric permeability for liquid crystalline solutions of 4-(ω)-hydroxyalkoxy-4-cyanobiphenils ($n=3,4$) in the mixture LC-807 were obtained. The addition of hydroxysubstituted compounds was shown to be accompanied by the increase in mesophase

thermal stability and dielectric anisotropy. Two zones for nematic phase of HO-4OCB+LC-807 system were revealed. It was connected with the change in associative state.

Key words: liquid crystal, mesogen, dielectric properties, birefringence, anizotropy

K.V. OKULOV, Yu.T. PANOV, A.I. VDOVINA, A.V. TARASOV

INFLUENCE OF PROPERTIES OF DIFFERENT BRANDS OF POLYAMIDE-6 ON POROMETRIC CHARACTERISTICS OF MICROFILTRATION MEMBRANES

Microfiltration polyamide membranes on the base of raw materials from different manufacturers were obtained. The influence of composition and structure of initial polyamide on the porometric and mechanical properties was established. Recommendations on polyamide selection for production of microfiltration membranes were given.

Key words: polyamide, membranes, microfiltration, additives

Yu.B. RUMYANTSEVA, E.A. KURGANOVA, G.N. KOSHEL, T.N. NESTEROVA, A.A. IVANOVA **SYNTHESIS AND OXIDATIVE TRANSFORMATIONS OF META- AND PARA- ISOMERS OF ISOPROPYLTOLUENE**

It was established that o-izopropyltoluene in mixture of its isomers inhibits the reaction of liquid-phase oxidation. Transalkylation o-, m-, p- izopropyltoluene mixture gives the fraction containing about 60 % - 40 % of m and n- izopropyltoluenes. The efficiency of this fraction for obtaining hydroperoxides of izopropyltoluene and phthalic acids was shown.

Key words: alkylation, cymene, transalkylation, cresol, m-, p-, o- isomers of isopropyltoluene, hydroperoxide of isopropyltoluene, N-hydroxyphthalimid

A.S. SHABLAKOVA, O.N. CHUPAKHIN, A.Yu. PETROV, V.N. CHARUSHIN, V.L. RUSINOV, S.A. GLAVATSKIKH, E.N. ULOMSKIY

DEVELOPMENT OF SOLID DOSAGE FORMS OF ANTIVIRAL AGENT

Triazavirin is Russian original antiviral agent. It was developed by Institute of Organic Synthesis of Ural division of RAS and Research Institute of Influenza. Every medicine should be in convient form for usage. Solid dosage forms were taken as models for Triazavirin production. Triazavirin powder technical characteristics were investigated for the purpose of getting qualitative forms. Wet granulation was chosen as preparation method. Obtained tablets and capsules are satisfied the requirements of Russian pharmacopeia.

Key words: antiviral agent, solid dosage forms, wet granulation, pills, capsules

R.G. SAFIULLIN

POROUS ROTATING SPRAYERS FOR HEAT AND MASS EXCHANGERS

The results of experimental study of dispersion characteristics of porous rotating sprayer (PRS) on the base of porous filtering ceramic are presented. The schemes of the use of PRS in the heat and mass transfer apparatus are presented.

Key words: porous rotating sprayer, porous filtering ceramics, monodisperse spraying, dispersion

I.A. SEMENOV, B.A. ULIANOV, D.N. SITNIKOV, M.Yu. FEREFEROV, D.P. SVIRIDOV **MASS TRANSFER IN LARGE DROPS AT METHANOL EXTRACTION WITH WATER FROM ITS N-HEXANE MIXTURE**

The methanol extraction from n-hexane mixture at drops outflow into water layers of various heights was studied. Steady-state of mass transfer in dispersed phase was established. Experimental results were presented in form of dependencies between diffusion Nusselt, Peclet and Prandtl criteria.

Key words: extraction, mass transfer, disperse phase

V.K. LEONTYEV, M.A. BARASHEVA

EVALUATING OPERATING EFFICIENCY OF GAS-LIQUID EJECTION DEVICE WITH MOBILE NOZZLE

The operation of gas-liquid ejection device with mobile nozzle was studied experimentally. The influence of gas phase flow, the size and volume of the nozzle on the efficiency of the process was established.

Key words: gas-liquid ejection device with mobile nozzle, specific free volume of nozzle, specific surface of nozzle, relative volume of mobile nozzle

A.P. SEMERNYA, G.I. LEPYOKHIN, P.V. MISHTA, E.A. BEDNARSKAYA
EXPERIMENTAL RESEARCHES OF PROCESSES OF HEAT AND MASS EXCHANGE
AT EVAPORATION OF FUEL FILM FROM SOLID SURFACE

Criterial equations were obtained at experimental studying the evaporation rate of films of pure hydro carbonic liquids from a constant surface depending on speed and temperature of air flow, on temperature of evaporation surface and on thermal and physical properties of liquid.

Key words: fuel film, evaporation, mass exchange, film device

I.V. FEDOSEEV, M.Sh. BARKAN, Yu.M. PROKHOTZKIY, N.E. LASKINA, A.Yu. LOGINOVA
UTILIZATION TECHNOLOGY OF USED MECHANICAL RUBBER GOODS

The utilization technology of rubber by means of destruction under the action of concentrated sulfuric acid was proposed. The process mechanism and its technological parameters were considered. The version of process flowsheet was proposed. The destruction product – carbon material- can be used as a sorbent of oil products and ions of heavy metals as well as component of building materials.

Key words: used mechanical rubber goods, utilization, sulfuric acid destruction

O.V. KOZLOVA, E.V. MELENCHUK
USE OF DOMESTIC POLYMERS AT CREATING RETRO-REFLECTING TEXTILE MATERIALS

Possible ways of obtaining retro-reflecting coverings on the textile materials intended for sewing goods with alarm properties were described at use of preparations of domestic polymeric chemistry. Efficiency of the developed technology from the point of view of obtaining qualitative and stable against physical-mechanical actions retro-reflecting effects on a fabric was shown.

Key words: retro-reflecting textile, polymers, glass beads, aluminum pigment, plasma treatment