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A B S T R A C T S

**M.M. MURZAKANOVA, T.A. BORUKAEV, M.M. LIGIDOVA, A.K. MIKITAYEV
MAIN REACTIONS OF N-ALKYLATION**

The main classes of alkylation of compounds are given. In work the ways of N-alkylation of organic substances were considered. Catalysts which are used and conditions of reactions carrying out were given.

Key words: synthesis, alkylation, nitrogen-containing compounds, alkylating reagents, catalysts

**N.Ya. KUZMENKO, S.N. KUZMENKO, O.V. SKRINNIK, D.M. MARCHENKO, O.O. KOLOMIETS
SYNTHESIS AND PHYSICAL-CHEMICAL PROPERTIES OF [(BU-
TOXY)(STEARATEACYLOXY)TITANATE]BORANES**

Synthesis and physical-chemical constants of oligomer products of reaction of re-etherification of tris[[tri(butoxy)titanate]borane by stearic acid was described at different their mole ratio. Extracted products were viscous liquids or solid substances which were soluble well in lowest alcohols, simple ethers, aliphatic-, aromatic- chloroaromatic- and chlorinated hydrocarbons. Their structure was verified by elemental analysis, molecular mass, infrared and ¹H NMR spectroscopy.

Key words: tris[[tri(butoxy)titanate]boranes, stearic acid, [butoxy (stearateacyloxy)] titaniumoxy] boranes, re-etherification, substitution degree

**Yu.B. IVANOVA, A.S. SEMEYKIN, N.G. MAMARDASHVILI, O.I. KOIFMAN
SPECTROPHOTOMETRIC STUDY OF ACIDIC AND COMPLEXATION PROPERTIES OF DE-
RIVATIVES OF OCTAMETHYL PORPHYRIN**

By the method of spectrophotometric titration the acidic and complexation properties of the derivatives of octamethylporphyrin were studied in the system 1,8- diazabicyclo[5.4.0] undets-7- ene - acetonitrile at 298 K. It was established that at titration of compounds mentioned above the deprotonation of nitrogen atoms of pyrrole rings occurred with the formation of the mono- and twice deprotonated forms. The step constants of acidic dissociation were determined. Complexing the twice deprotonated forms of the studied ligands with zinc acetate was investigated. The kinetic parameters of appropriate reactions were obtained. The comparative analysis of the kinetic parameters of the formation of the zinc complexes of the ligands under study on the ionic and molecular mechanisms was carried out.

Key words: porphyrins, acidic properties, coordination properties, reactions, kinetics

**M.A. KOVALEVA, V.A. FEDOROV, T.N. VINICHENKO, V.G. SHRAM,
O.N. PETROV, N.N. LYSYANNIKOVA****EFFECTS OF MEDIUM UNDER FORMATION OF HYDRO-SULFATE ION IN ISOMOLAR SOLU-
TIONS OF NITRIC ACID AND HYDROBROMIC ACID AND THEIR SALTS**

This paper presents a general approach for investigation of weak ion-ion interaction in solutions allowing determining simultaneously the constants of such interactions, and the parameters characterizing the impact on these constants the changes in an ionic composition of medium using chlorides and bromides of alkali metals as example.

Key words: solubility, hydrosulphate ion, medium effect

**M.B. BEGIEVA, W.H. SHELGAEV, M.Kh. LIGIDOV, Yu.A. MALKANDUEV
NANO COMPOSITE MATERIALS BASED ON N,N-DIALLILAMINOETHANE ACID**

The nanocomposites were obtained with the reaction of radical polymerization on the basis of Na⁺-montmorillonite and new monomer – N, N-diallylaminoethanoic acid in the presence of the radical initiator in the water environment. The structure and thermomechanical properties of nanocomposites were investigated.

The received nanocomposites on the basis of N, N-diallylaminoethanoic acid were shown to possess the increased thermostability and pronounced water repellency.

Key words: nanocomposite, radical polymerization, polymer, monomer, monomer- N,N- diallylaminoethane acid, poly- N,N- diallylaminoethane acid, molecular weight

D.V. BABAIYKIN, A.A. ILYIN, A.P. ILYIN, R.N. RUMYANTSEV, K.O. DENISOVA
**STUDY OF IMPURITIES FORMATION IN PROCESS OF CARBON OXIDE FORMATION
AT AMMONIA OBTAINING ON DEVICES OF LARGE UNIT POWER**

In given paper the analysis of compartment of carbon monoxide conversion with the steam included in the ammonia synthesis unit of the third generation was carried out. The influence of process parameters on the temperature regime of the contact system and the formation of undesirable organic impurities was considered. The possibility of the formation of ammonia in the process of medium temperature and low-temperature CO conversion was shown.

Key words: carbon mono oxide, low temperature conversion, high temperature conversion, activity, selectivity

K.G. GORBOVSKIY, A.M. NOROV, A.S. MALYAVIN, A.I. MIKHAIYLICHENKO
**VISCOSITY STUDY OF PULPS AT PRODUCTION OF COMPLEX
NITROGEN-CONTAINING FERTILIZERS**

The viscosity study results of nitrate-phosphate-ammonia pulps requiring for obtaining fertilizer of 22:11:11 mark are presented. Equations for dependence of viscosity on temperature and pulps humidity were obtained.

Key words: complex fertilizers, nitric acid, phosphoric acid, ammonia, viscosity

A.V. KUNIN, D.N. LAPSHIN
**HYDROPHOBIZATION OF AMMORPHOUS SILICON DIOXIDE OF DIFFERENT TRADEMARKS
IN PROCESS OF MECHANOCHEMICAL MODIFICATION**

The properties of the surface of silicon dioxide powder obtained by liquid-phase and gaseous-phase methods were studied with the potentiometric titration and IR-Fourier spectroscopy. Application of mechanochemical modification instead of hydrophobization in blenders at high temperature makes it possible to decrease the organosilicon liquid consumption from 17-25 to 8-10 wt. %. Water-repellency of produced hydrophobic particles of silicon dioxide WC-120 is 30 h., WC-50 – 17 h., and Aerosil A-175 – 38 h.

Key words: hydrophobization, silicon dioxide, grinding, mechanochemical activation, modification, surface, acid-base properties

M.V. BARANNIKOV, Yu.M. BAZAROV, T.S. USACHEVA, O.I. KOIFMAN
INFLUENCE OF POLYAMIDE-6 MICRO HETEROGENEITY ON ITS THERMAL PROPERTIES

Fractionating of PA-6 produced with "Kuiybyshhev Azot" allowed obtaining 5 fractions that were studied by viscometry, thermogravimetry (TG, DTG) and differential scanning calorimetry (DSC) methods. It was shown that with increasing the molecular weight the content of non-linear structures arising from side reactions of deamination and decarboxylation was increased. It was found that the increase in the molecular weight of the polymer, which should be result in a growth of the phase transitions temperatures, is compensated with the contribution of non-linear structures of the polymer into these parameters.

Key words: Polyamide-6 (PA-6), polymers solutions, determination of PA-6 molecular mass, PA-6 preparation

***Kh.Kh. SAPAEV, I.V. MUSOV, L.Kh. KUCHMENOVA, S.Yu. KHASHIROVA, M.Kh. LIGIDOV,
S.I. PAKHOMOV, M.T. BASHOROV, A.K. MIKITAEV***
**INVESTIGATION OF THERMAL PROPERTIES AND DEVELOPMENT OF NEW RECEIPTS
OF FIRE RESISTANCE POLIVINYLCHEMICAL PLASTICATE FOR CABLE INSULATION,
SHELL AND FILLING**

The article presents the results of a study of thermal, technological properties and the development of new receipts of fire-resistant polyvinylchloride plasticate (PVC) for the cable insulation, shell and filling. The influence metal hydroxides on thermal properties of the plasticates was established by thermogravimetric analysis (TGA) and differential scanning calorimetry (DSC). The thermal stability of PVC depends directly on met-

al hydroxides content. The greatest impact on improving the thermal stability of PVC plasticate has a magnesium hydroxide. Designed PVC plasticates for insulation, shell and filling have higher fire characteristics, such as resistance to ignition and combustion, smoke production rates, the value of the heat of combustion in comparison with foreign and domestic analogues.

Key words: PVC - plasticate, thermal stability, flame resistance, heat emission, smoke production

*P.S. MAMEDOVA, S.N. GUSEIYNOVA, A.E. DUBININA, E.R. BABAIEV, N.Ch. MOVSUM-ZADE,
D.M. KULIEVA, E.M. MOVSUM-ZADE*

HETERO-ORGANIC NITRILES AS ANTIMICROBIAL ADDITIVES FOR PROTECTION OF OIL, GASES AND PRODUCTS OF THEIR PROCESSING FROM BIODETERIORATION UNDER STORAGE AND TRANSPORTATION

The work presents the results of the researches of antimicrobial properties of synthesized hetero-organic nitriles, potentially productive and biologically active reagents, which have a series of interesting and important properties. The first attempts of comparison of antimicrobial properties of inorganic and hetero-organic derivatives of nitriles were given. The regularities of impact of the heteroatom on antimicrobial activity of studied compounds were established.

Key words: antimicrobial properties, biological activity, hetero-organic nitriles

A.A. LIPIN, A.G. LIPIN, A.V. SHIBASHOV

SYNTHESIS OF COPOLYMER OF SODIUM METHACRYLATE AND METHACRYLIC ACID AMIDE USING POLYMERIZATION-DESORPTION PROCESS

Experimental investigations of two-step synthesis of copolymer of methacrylic acid derivatives were carried out. On the first step the sodium methacrylate and methacrylic acid amide copolymerization initiated by potassium persulfate is performed in concentrated water solutions under isothermal conditions. On the second step the polymerization is combined with product drying.

Key words: copolymerization, sodium methacrylate, methacrylic acid, polymerization, solution, drying

A.B. GOLOVANCHIKOV, S.B. VOROTNEVA

MODELING OF OPERATION OF DOUBLE-PIPE HEAT EXCHANGER TAKING INTO ACCOUNT WITH THERMAL DIFFUSION OF GAS HEAT CARRIER

The mathematical model of double-pipe heat exchanger with thermodiffusion flow structure on the hot heat carrier in outside of tubes and with a plug flow on the cold heat carrier was proposed. It was shown that the change in the flow structure of the hot heat carrier from the typical one corresponding to a plug flow, to the flow structure of perfect mixing the heat transfer surface area and length of the heat exchanger should be increased by 2 times.

Key words: thermo diffusion flows structure, double-pipe heat exchanger, ideal mixing, ideal plug, Peclet number of longitudinal heat conductivity

A.V. MITROFANOV, V.E. MIZONOV, L.N. OVCHINNIKOV, N.S. SHPEIYNOVA

VERIFICATION OF CELL MODEL OF COMBINED TRANSFER OF HEAT AND MOISTURE IN FLUIDIZED BED

The experimental verification of the cell mathematical model of evolution of the fluidized bed expansion during drying was carried out. The model consists of two parallel chains of cells for particles and gas with the intermutual influence of transition probabilities in homologous cells. In addition, the homologous cells can exchange with the heat and moisture at each time of transition. The comparison of simulation and experimental results is presented.

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

V.S. FROLOV, A.V. BOGORODSKIY, V.N. BLINICHEV, A.V. VETYUGOV

RESEARCH OF INFLUENCE OF RATIO OF VOLUMES OF GRINDING BODIES AND MATERIAL IN NEW ROTATIONAL-VIBRATIONAL MILL

This paper presents the design of a new rotational-vibrational mill. Experimental studies on milling of river sand in grinding mill of this type with different ratios of grinding bodies and grinding material were carried out. The dependence of the degree of grinding of river sand on the material size was shown.

Key words: grinding, mill, grinding degree

N.S. TANGYARIKOV, S.M. TURABZHANOV, A. IKROMOV, N.Kh. MUSULMANOV
**MATHEMATICAL DESCRIPTION OF REACTOR FOR SYNTHESIS OF ACETALDEHYDE
AND ACETONE**

The mathematical model of the catalytic hydration of acetylene with formation of acetaldehyde and acetone in an isothermal plug flow reactor was proposed. At describing of hydration the processes of the catalyst deactivation were taken into account.

Key words: acetylene hydration, plug flow reactor

R.O. VOLOSHIN, Yu.P. YASIYAN
**ANALYSIS AND PERSPECTIVES OF ALKYL PEROXIDE APPLICATION AS PROMOTERS
OF IGNITION**

The paper presents the ways of increasing cetane numbers of diesel fuels. The research describes the advantages and disadvantages of the main promoters of ignition - alkyl peroxide and alkyl nitrates, the influence of Di-tert-butyl peroxide on cetane number of diesel fuels samples. Studies on the ability of the multifunctional additive CDP to improve flammability of fuels were carried out. Stability of diesel fuel at long-time storage after the introduction of CDP addition was studied.

Key words: cetane number, diesel fuel, alkyl peroxides, alkyl nitrates, di-tert-butyl peroxide

A.A. MIRZOEVA, S.A. AGAEVA
ELECTRODEPOSITION OF SELENIUM FROM ALKALI ELECTROLYTES

It was established that in alkaline electrolytes selenite ion is reduced up to selenide (Se^{2-}) $\text{SeO}_3^{2-} + 6\bar{e} + 3\text{H}_2\text{O} \rightarrow \text{Se}^{2-} + 6\text{OH}^-$. Using anode process it is possible to obtain elementary selenium at application of alkaline electrolytes containing SeO_3^{2-} of different concentrations. The anode process dependence on temperature, electrolyte density, and current density was established. It was shown that by this method it is possible to obtain elementary selenium with purity of 99.9 %.

Key words: elementary selenium, alkali electrolytes, electro deposition, anode process, cathode process

V.A. KHOLODNOV, M.Yu. LEBEDEVA
**MATHEMATIC MODEL OF WATER-ECOLOGICAL PROCESS FOR STUDY OF IMPACT
OF WASTERWATERS FLOW TO RIVER OF INDUSTRIAL PLANT**

In given article the influence of wastewater flow of industrial plants on pollution degree of water in City River was studied. The stationary non-conservative transfer of pollutants is considered on the base of mathematic model. Concentrations of soluble oxygen, oxygen biochemical demand and nitrates were estimated along the river at different disturbances of parameters of wastewater flow.

Key words: wasterwaters, soluble oxygen concentration, oxygen deficit, oxygen biochemical demand nitrites concentration