SYNTHESIS OF BIS(PYRAZOL-1-YL)ALKANES WITH A LONG POLYMETHYLENE LINKER IN A SUPERBASIC MEDIUM

A.S. Potapov, L.V. Zatonskaya, A.I. Khlebnikov

Bidentate ligands with a linker of four, five, six or eight methylene groups were synthesized by the reaction of α,ω-dibromoalkanes and 3,5-dimethylepyrazole in a superbasic medium KOH-DMSO. Oxidative iodination of the prepared compounds gave new diiododerivatives in high yields.

Keywords: superbasic medium, bis(pyrazol-1-yl)alkanes, iodination, alkylation.

СИНТЕЗ *N*-АЦИЛГИДРАЗОНОВ НА ОСНОВЕ АЦЕТАЛЕЙ АЛЬДЕГИДОВ

Д.И. Колено, А.В. Сысоев, Ю.В. Мороженко

Synthesis of N-acylgidrazonov of hydrazides of carboxylic acids difficult instability of many aldehydes or ketones in the condensation reaction. This work extends the use of carbonyl compounds due to the use of acetal derivatives. Obtained by condensation products of isonicotinic acid hydrazide, p-bromobenzoate and adipic dihydrazide, oxalic acid with different aldehydes.

Keywords: condensation, hydrazides, acetals, nucleophilic substitution.

SYNTHESIS AND MODIFICATION OF PETROLEUM-BASED RESINS TSIKLOPENTADIENOVOY FRACTION LIQUID PYROLYSIS PRODUCTS

O.U. Fedorova, E.V. Bokova, A.A .Manankova, T.N. Volgina

Volgin*Investigated modification petroleum resins derived from tsiklopentadienovoy fraction of liquid pyrolysis products that blend N2S2O8, N2SO5, H2O2, O2 and O3 as oxidizing agents. Found that the oxygen-containing groups introduced into the structure of the resin through its indirect oxidation, improve the properties of the resin and operational characteristics of the films based on it.*

Keywords: petroleum resin, oligomerization, modification, physical and mechanical properties, film-forming materials, liquid-phase oxidation, electrolysis of sulfuric acid.

SEARCH FOR AN ACCESSIBLE METHOD FOR THE SYNTHESIS OF OSELTAMIVIR PHOSPHATE

A.I. Kalashnikov, S.V. Sysolyatin, E.G. Sonina, I.A. Surmacheva

Consideration was given to the well-known methods for the synthesis of oseltamivir phosphate. Methods based on (-) shikimic acid have been recognized to be the most accessible. Options of the oseltamivir synthesis via the O-trimesylate of shikimic acid ethyl ester were experimentally tested. Main regularities of the process were determined, and the product was obtained in 16.9% yield.

Keywords: oseltamivir phosphate, ethyl (3R,4R,5S)-4-acetamido-5-amino-3-(1-ethylpropoxy)cyclohex-1-ene-1-carboxylate, shikimic acid, aziridine formation.

CRYSTAL STRUCTURES AND PHYSICAL AND CHEMICAL PROPERTIES OF THE LANTHANIDES COMPLEXES WITH HEXAMETHYLTRIAMIDOPHOSPHATE

A. A. Bobrovnikova, E.S.Tatarinova

Synthesis and the physical and chemical analysis tetra(isotiocyanato)diaminechromates(III) dinitratotetra(hexamethylphosphormaide) complexes of the lanthanides ceric group with the hexamethylphosphormaide.

Compounds of tetra(isotiocyanato)diaminechromates(III) dinitratotetra(hexamethylphosphormaide) complexes of the lanthanides ceric group with the hexamethylphosphormaide $[LaL_4(NO_3)_2][Cr(NH_3)_2(NCS)_4]$, где L = $((CH_3)_2N)_3PO$ and tetra (hexamethylphosphormaide) solvate tetra(isotiocyanato)diaminechromates(III) ammonium $(NH_4)[Cr(NH_3)_2(NCS)_4]\cdot 4((CH_3)_2N)_3PO$ methods of the IR spectroscopic, X-ray phases and structural, differential thermal analysis are received and investigated.

Keywords: rare-earth elements, tetra(isotiocyanato)diaminechromates(III) ammonium, hexamethylphosphormaide.

HEXA(ISOTHIOCYANATO)CHROMATE(III) LUTECYUM(III) COMPLEXES WITH ε-CAPROLACTAM

E.V.Cherkasova

Investigate preparation of different double complex compounds from water solutions of nitrate lutecyum(III), hexa(isothiocyanato)chromate(III) calium $K_3[Cr(NCS)_6].nH_2O$ and ε-caprolactam. Preparation ana investigation new complex $[LuCpl_6][Cr(NCS)_6]$ 2Cpl.

Keywords: double complex compounds, lutecyum, hexa(isothiocyanato)chromate(III) calium, ε-caprolactam.

OZONATION OF ALIPHATIC, CYCLOALIPHATIC AND AROMATIC PETROLEUM RESIN

V.G. Bondaletov, A.A. Troyan, N.O. Kuhlenkova, V.D. Ogorodnikov

The interaction of aliphatic, cycloaliphatic and aromatic petroleum resins, obtained on the basis fraction of liquid products of pyrolysis, with ozone. Found that ozonization of petroleum resins leads to significant changes in their functional composition, the appearance of peroxide, carboxyl, carbonyl groups, which allows their use for further modification and expansion of al-assortment resins.

Keywords: liquid products of pyrolysis, petroleum resin, ozonization, ozone, modification.

REACTVITY IN COPOLUMERIZATION WITH PHENYL ACCETYLENE 9 –VINYLCARBAZOLE

OV Rotar, V.M. Sutyagin, DV Iskizhitskaya

The reactivity of the activity in the copolymerization with phenyl acetylene 9 - vinylcarbazole in radical and cationic initiation. With parameter Harwood estimated compositional heterogeneity of the copolymers. The possibility of using copolymers as a photosensitive material.

Keywords: 9-vinylcarbazole, phenyl acetylene, compositional heterogeneity, photosensitive materials.

INVESTIGATION OF DICYCLOPENTADIENE FRACTION OF LIQUID PYROLYSIS PRODUCTS OLIGOMERIZATION WITH THE USE OF $Ti(OC_8H_8Cl)Cl_3$ – $Al(C_2H_5)_2Cl$ AS A CATALYST SYSTEM

A. A. Manankova, V. G. Bondaletov, T. A. Vorobieva

The work is devoted to investigation of oligomerization fraction of liquid pyrolysis products with increased content cyclo-, dicyclopentadiene using a catalyst system based on the monosubstituted titanium chloride and diethylaluminumchloride. Found that the resulting light petroleum resins can be used to produce paints.

Keywords: Petroleum resins, oligomerization, cyclo- and dicyclopentadiene fractions of liquid pyrolysis products, monosubstituted titanium chloride, coating materials.

A.V.Tikhomirova

Structure complexes $[Ln(C_6H_{11}NO)_8]_2[Hg_2I_6]_3$ (Ln – Ln = La^{3+}, Ce^{3+}, Pr^{3+}, Nd^{3+}, Sm^{3+}) are received. Composition is positioned by means of chemical analysis. Coordination compounds are explored by means of Ik-spectroscopic, X-ray and thermal analyses.

Keywords: ε-caprolactam, iodomercurat, lanthanoid, Ik-spectrum, X-ray pattern, thermolysis.

IR – SPECTROSCOPIC INESTIGATION OF SOLID PRODUCT INTERACTS TRIOXOLATOCHROMATE(III) AMMONIUM WITH AMMONIATE ZINC, CADMIUM AND MERCURY, RECEIVED IN DIFFERENT CONDITIONS

A.L. Vornakov

The investigated IR - spectroscopic method solids deposition ammoniates zinc, cadmium and mercury with trioxolatochromate(III) ammonium. obtained in open and closed systems. The method for obtaining pure crystalline solids

Keywords: IR - spectroscopic research method, open system, closed system, a pure product.

RESEARCH OF PROPERTIES OF COORDINATION COMPOUNDS OF CADMIUM WITH ε-CAPROLACTAM

J.R. Giniyatullina

The conditions of synthesis of new coordination connections are developed. The resulting compounds were studied by IR spectroscopic analysis. The processes of thermolysis of the complex $CdCl_2 \cdot$ε-$C_6H_{11}NO$ (1:1) are studied in the air and in the inert atmosphere by a thermogravimetric method.

Keywords: synthesis, cadmium, ε-caprolactam, IR spectroscopic analysis, thermal analysis.

INFRARED SPECTROSCOPIC STUDY OF FERROELECTRIC PROPERTY BY THE EXAMPLE OF CROCONIC ACID

V.P. Kuznetsov, E.V. Saltanova, A.S. Sukhih, U.A. Fadeev

The croconic acid is researched by spectroscopic method on exposure to applied electrostatic field. Findings are showed that spectrum change of intramolecular vibration is occur, particularly there are band intensity redistribution of molecular fragment which take part in hydrogen bonds. Observable changes in spectrum is explained by redistribution of electron density in croconic acid molecule.

Keywords: croconic acid, repeated frustrated total internal reflection spectrum, hydrogen bond.

ANALYSIS OF STREAM GRAPHS OF SYSTEM WATER - N-BUTYL ALCOHOL - ACETIC ACID - N-BUTYL ACETATE

I.V. Seselkin

The thermodynamic-topological analysis of phase diagram of complex four-component system water - n-butyl alcohol - acetic acid - n-butyl acetate was conducted. Types of special points of the diagram were investigated. Graphs of fractions' sequence allocations and streamed graphs were developed and analysed. The principal technological schemes of separation of the mixture were offered.

PROPERTIES OF EPOXY RESINS, INOCULATED ON POLYMETIL-*n*-TRIPHENYLBORATE AND NANOPARTICLES THE VARIOUS NATURE

E.S.Ananjeva, M.A.Lensky, I.S.Larionova, V.N.Beljaev, A.V.Ishkov

Physical and chemical characteristics and mechanical characteristics production epoxy binding ED-20, ED-22 (in Russian), inoculated on polymetil-n-triphenylborate (PMTPB in Russian), carbon nanoparticles UDA, UDAG (in Russian), and also nanoparticle Al_2O_3, after their solidification of amines and anhydrides systems are investigated. It is established, that at modification of resin ED-22 on PMTPB in a polymeric matrix there is a formation heteroblocs structures and at modification of epoxy resin ED-20, ED-22 of nanoparticles decrease of impact strength and tangent of angle of mechanical losses and increase in a complex modulus of pressure with propagation of a share nanocorpuscles and increase of fractal dimensions of a quantity received of nanocomposites is observed.

Keywords: epoxy resin, polymetil-n-triphenilborate, thermosteadying polymer, nanocomposite, structure and properties of a material, filler, fractal, fractal dimension, cluster.

EFFECT OF HEAT TREATMENT ON THE FORMATION OF PRECURSORS OF THE SURFACE MORPHOLOGY OF CALCIUM ALUMINATE

L.A. Selyunina, T.M. Nalivaiko, L.N. Mishenina, V.V. Kozik

Using scanning electron microscopy and X-ray diffraction were investigated the effect of temperature, heating rate and annealing time on the phase composition, surface morphology and degree of perfection of calcium aluminate obtained by the sol-gel method.

Keywords: calcium aluminate, sol-gel, the surface morphology.

ADSORPTIVE PROPERTIES OF CERIUM OXIDE(IV)

O.S. Khalipova, S.A. Kuznetsova, V.V. Kozik

The morphology and acid-base properties of surface of cerium oxide(IV) were investigated by pH-meter method, IR-spectroscopy, scanning electron microscopy methods. The samples were prepared by thermal decomposition of cerium nitrate(III) and cerium nitrate gidroksosalitsilat(III). It was found that the composition of the precursor influences the state of the surface of CeO_2, which determines its adsorption properties.

Keywords: properties of cerium oxide(IV), the surface morphology, adsorption.

RADIATION EFFECTS ON OPTICAL PROPERTIES MoO_3

L.N. Bugerko, N.V. Borisova, V.E. Surovaya*, G.O. Eremeeva

The conversion of films MoO3 (d = 8-130 nm) with increasing exposure time, as well as with decreasing film thickness in atmospheric environment - increases. The irradiation of films MoO3 showed a decrease of the optical density in the range of λ = 310 - 435 nm and the formation of the absorption maximum at λ = 870 nm. The mechanism of transformation of films MoO3, comprising: forming in the preparation and heat treatment of films MoO3 center $[(V_a)^{++}\ e]$, the transition of an electron from the valence band to the level of the center $[(V_a)^{++}\ e]$ with the formation of the center $([(e\ (V_a)^{++}\ e])$.

Keywords: molybdenum oxide (VI), irradiation, mechanism.

IRRADIATION INFLUENCE ON NANOSIZE INDIUM FILM OPTICAL PROPERTIES

G.O.Ramazanova, L.I. Shurygina

Optical density of nanosize (d = 1-32 nm) indium films reduces as a result of radiation by the light 360 nm and intensity of $I = 1{,}12 \cdot 10^{15}$-$7{,}0 \cdot 10^{15}$ quantum·cm^{-2}·s^{-1} at T = 293 K. An indium (III) oxide is formed at the indium surface by the light treatment. Kinetic curve of photochemical conversion degree of indium films are well described within linear, return logarithmic, parabolic and logarithmic laws.

Keywords: nanosize indium films, photoinitiated oxidation.

INFLUENCE OF INDIUM LAYER ON MOLYBDENUM (VI) OXIDE THERMAL CONVERSION IN NANOSIZE In-MoO_3 SYSTEM

G.O. Ramazanova, L.I. Shurygina

It is established that in the course of thermal treatment at T = 423-873 K absorption and reflection spectra of In-MoO_3 films are considerably change. A speed of nanosize MoO_3 film's thermal conversion increases by the indium's layer influence. The contact potential difference of In, MoO_3 films and photo-EMF of In-MoO_3 systems are measured. The chart of power zones of In-MoO3 systems is constructed.

Keywords: nanosize films, heterogeneous system, indium, molybdenum (VI) oxide.

SINGULAR TERMOSTIMULATER OF TRANSFORMATIONS IN NANOSIZE MANGANESE OF FILMS

T.M. Zaikonnikova, T.J. Kozhuhova

It is established that at heat treatment of films of manganese in thickness of 2-76 nanometers in the range of temperatures 473-673 K in atmospheric conditions manganese (II) oxide is formed. Depending on initial thickness of films of manganese and heat treatment temperature kinetic curve extents of transformation are well described within linear, return logarithmic, cubic and logarithmic laws.

Keywords: nanosize films, heat treatment, optical properties.

INFLUENCE OF CHROME ON OPTICAL PROPERTIES OF TUNGSTEN (VI) OXIDE

T.M. Zaikonnikova, T.J. Kozhuhova

Methods of optical spectroscopy, microscopy, gravimetriya investigated transformations in nanosize systems Cr-WO_3 depending on thickness of films of Cr and WO_3, temperature and heat treatment time. The model of thermal transformation of films of WO_3 in Cr-WO_3 systems, formation in the course of preparation of a film of the WO_3 center ($[(V_a)^{++} e]$), its transformation at creation of Cr-WO_3 systems in the center ($[e (V_a)^{++} e]$).

Keywords: nanosize films, thermotransformations, heterogeneous systems.

PHOTOELECTRIC RESEARCHES OF NANODIMENSIONAL SYSTEMS Pb– PbO AND Pb – WO_3

S.V. Bin, A.I. Mokhov

The contact potential difference before preliminary warming up (T = 550 K) nanodimensional films of lead, lead (II) and tungsten (VI) oxides is measured under various external conditions ($P = 1 \cdot 10^5$, $1 \cdot 10^{-5}$ Pa; T = 293 K). Measurements of photo-EDS systems Pb– PbO, by Pb _ WO_3 are carried out. Charts of power zones of systems Pb – PbO, by Pb _ WO_3 are constructed.

Keywords: lead, oxides of lead (II) and вольфрма (VI), nanosize films, heterogeneous system.

THERMALLY-STIMULATED TRANSFORMATION IN NANOSIZE COBALT FILMS

E.P. Surovoy, A.A. Sukhorukova, S.M. Sirik

As a result of thermal treatment in temperature range of 473-773 K in atmospheric conditions, thickness, mass, absorption spectra and reflection spectra of nanosize cobalt films (d = 1-40 nm) vary considerably. Changes in the absorption spectra, thickness and mass of cobalt films are associated with the formation of cobalt oxide (II) on their surface. Depending on the initial thickness of the cobalt film and thermal treatment temperature kinetic curves of the transformation degree are satisfactorily described in the framework of linear, inverse logarithmic, cubic and logarithmic laws.

Keywords: cobalt, cobalt oxide (II), nanosize films.

CHANGES OF NICKEL NANOSIZE LAYERS OPTICAL PROPERTIES DURING THE HEAT TREATMENT

E.P. Surovoi, YU.YU. Vlasova, S.M. Sirik

Systematic research and regularities influence of heat treatment at T = 473 - 673 K on the optical properties of nanosize layers of nickel (d = 2 - 43 nm). The degree of thermal transformation of nanosize Ni films depends on their original thickness, temperature and time of heat treatment. Found that during the heat treatment of nickel is formed of nickel oxide (II). The kinetic features of the process of formation of nickel oxide have been studied.

Keywords: termotransformation, nickel, nickel oxide (II), nanosize layers.

MODIFICATION NANOSCALE FILMS OF BISMUTH IN AN AMMONIA ATMOSPHERE

V.E. Surovaya*, L.N. Bugerko, T.G. Cherkasova*

In the interaction of bismuth films of thickness (d = 1 - 56 nm) with ammonia gas at T = 293 K for τ = 1 min – 5400 hrs. formed nitride bismuth. Depending on the thickness of the samples the kinetic curves of conversion are described in terms of linear, inverse logarithmic, parabolic and logarithmic laws. A model of the transformation of bismuth films, including stages of ammonia adsorption, the redistribution of the charge carriers in the contact field Bi - BiN and nitride formation of bismuth.

Keywords: nanoscale bismuth film, bismuth nitride, chemical adsorption of gases, heterojunctions.

THE RESEARCH OF THE PHOTOCURRENT IN SYSTEMS Al – WO_3 – Al

In a range of external tension ± 10 V irrespective of thickness of films of WO_3 (20÷100 nm), time of endurance of samples in atmospheric conditions (2÷180 h) on kinetic curves of a current of a relaxation of systems Al – WO_3 – Al are shown three sites: sharp increase of a current (an initial maximum), a site of reduction of a current and a stationary site, and also is absent energy storage in systems. It is established that stationary value of a photocurrent of system Al– WO3 – Al irrespective of size of the enclosed external tension (± 10 V) on five orders exceeds value of a current of the same system.

Keywords: nanosize layers, photocurrent, kinetics

PHYSICO-MATHEMATICAL MODEL OF EVAPORATION OF FINE AEROSOLS DROPS

A. A. Antonnikova, N. V. Korovina, O. B. Kudryashova

The physico-mathematical model of evaporation of drops of an aerosol taking into account humidity and temperature of the environment, the size, temperature and physico- chemical properties of substance of drops is offered. It is shown that evaporation of micron drops happens intensively because of a big specific and mass surface of particles and, as a result, improvement heatmass exchange with environment.

Keywords: evaporation, fine aerosol, humidity.

PHASE COMPOSITION AND THERMAL STABILITY OF (Na_2O)-NiO-V_2O_5/γ-Al_2O_3 DEHYDROGENATION CATALYSTS SUBJECTED TO THERMAL TREATMENT IN AIR AT VARIOUS TEMPERATURES

I.Y. Petrov[1], B.G. Tryasunov[2]

It has been established that in the presence of V_2O_5, phase transitions in γ-Al_2O_3 ($\gamma \rightarrow \delta,\theta$), observed for pure alumina support at T > 900℃, occurred within already 700-900℃. Formation and posterior decomposition of $AlVO_4$ in this temperature range facilitates the generation of α-Al_2O_3. NiO added to V_2O_5/γ-Al_2O_3 catalysts has been shown to suppress the mineralizing action of V_2O_5 on phase transitions in Al_2O_3 and to stabilize the spinel lattice structure of alumina support.

Keywords: thermal stability, phase composition, (Na_2O)-NiO-V_2O_5/γ-Al_2O_3 catalysts, alumina support, thermal treatment.

INTERACTION OF CARBONIZED COAL WITH SUPERHEATED STEAM

E.I. Kagakin, A.R. Bogomolov, S.A. Shevyrev, N.A. Pribaturin

Investigation results of oxygen-free steam gasification of carbonated coal mine «Beryzovskaya» in dense bed are shown. Ability of getting fuel gas or synthesis-gas with high content of hydrogen and carbon dioxide is shown. Reaction rate constants and activation energy of process are determined.

Keywords: srteam gasification, kinetics, carbonization, superheated steam

CAUCASIAN MINERAL FEEDSTOCK FOR BASALT FIBER PRODUCTION

N.N. Khodakova, T.K. Uglova, V.V. Firsov, O.S. Tatarintseva

The possibility to produce basalt fibers from eruptive rocks of the Caucasian region has been examined. These molten rocks were shown to afford thickened and rough continuous fibers within a wide temperature range. Staple fibers (basalt wool) with characteristics meeting the normative documentation requirements were obtained on a setup with induction melting of the mineral feedstock and acoustic air-blowing of the melt.

Keywords: rocks, continuous and staple basalt fibers, viscosity, surface tension, crystallizability.

PROCESSING OF COAL SLURRY IN THE FEEDSTOCK FOR COGENERATION DEVICES

A.V.Nevedrov, A.V. Papin

Qualitative characteristics of coal slimes are investigated. Experimental study on enrichment method of oil agglomeration. Identified qualitative characteristics of coal concentrates obtained from coal slimes.

Keywords: coal sludge, coal concentrate, oil agglomeration, enrichment, ash, cogeneration unit.

REGULARITIES OF OXIDATION OF AMORPHOUS RED PHOSPHORUS AT DIFFERENT RELATIVE HUMIDITY

G. T. Shechkov, M. A. Tikhonov, R.S.Ivanov

The stadiynost of process of oxidation of red phosphorus from the lowest extent of oxidation P+1 to P+3 and to P+5 is established further, influence of relative humidity on speed of process and a ratio of the condensed products of the oxidation, equal 0,33:0,55:0,12 is shown. The assessment of energy of activation of formation of phosphoric acids is made..

Keywords: red phosphorus, oxidation, acids, energy of activation.

OBTAINING OF DIESEL OIL FURNACE FUEL WITH THE USE OF NANOACCELERATOR AND MATRICES OF DISASSEMBLY AND ASSEMBLY IN NANOSTRUCTURES

A.I.Leontieva V.S. Orehov A.V. Vyzhanov

The method of obtaining diesel fuel from the fuel oil using matrices of disassembly and assembly in nanostructures. Nanocatalysts made selection affect the yield and quality of diesel fuel.

Keywords: heating oil, diesel fuel, matrix assembly, matrix disassembly, nanocatalysts.

THE MODIFIED TREATMENT OF THE TITANIUM DIOXIDE PIGMENT FOR SELF-CLEANING MATERIALS

Prosvirkina E.V. Harchenko E.N. Balabashchuk I.V. Larichev T.A.

The article describes a technique modification of the properties of the titanium dioxide. The influence of acid-alkaline treatment and dispersing under the action of ultrasound methods were investigated. The strength characteristics of photocatalitic coatings were determined.

Keywords: photocatalyst; titanium oxide; rutile, strength evaluation.

RESEARCH OF PHYSICOMECHANICAL CHARACTERISTICS OF THE POLYMERIC METALLIZED COMPOSITES ON THE BASIS OF AMMONIUM NITRATE

V.N.Popok, A.V.Starikova

Results research of physicomechanical characteristics of the polymeric metallized composites on the basis of ammonium nitrate are presented in article. Data for composites containing micro and ultrafine powders of aluminum are obtained. The assessment of warranty periods of storage of composites is carried out.

Keywords: polymeric metallized composites, ammonium nitrate, aluminum powders, physicomechanical characteristics, warranty period of storage.

DEVELOPMENT OF CONSTRUCTION OF DEVICE FOR CENTRIFUGAL-ACOUSTIC CATCHING OF NANOSIZED AEROSOLS

V.N. Khmelev, A.V.Shalunov, V.A.Nesterov, K.V.Shalunova, A.N.Galakhov, R.N.Golykh

This article is describes the construction of improved cyclone device with counter swirling flows for catching of nanoparticles. The feature of improved device is addition of the two ultrasonic oscillations radiators that are piezoelectric oscillation systems with disc-shape radiators. The counter swirling flows device analysis by finite element method has shown high efficiency of developed cyclonic separating device (nanoparticles catching efficiency up to 90%).

EFFICIENCY DEFENSIVE COATINGS OF NANOSIZED ALUMINUM IN ECS WITH THE ACTIVE BINDER

M.V. Komarova, V.F. Komarov, N.V. Bychin

The paper reports the results of thermogravimetric studies of mixtures of the active binder with nanosized aluminum powders, having different defensive coatings. Particularity of morphological agglomerates of coating aluminum particles was described. There was chose the optimum covering for using in fuel system with the active binder.

Keywords: nanosized aluminum, defensive coatings, energy condensed systems (ECS).

COMPARATIVE CHARACTERISTICS OF ANODIC ALUMINA OBTAINED WITH ALTERNATING AND DIRECT CURRENTS

A.A. Vikharev, A.V. Vikharev

The paper presents the comparative results of study of phisical and chemical properties of anodic alumina obtained with different conditions.

Mathematical modeling of the flow interrupter passage area of the multistage rotary-pulsed apparatus

S.Ye. Orlov, M.S. Vasilishin

The calculation method of the flow interrupter passage area of the multistage rotary-pulsed apparatus and the hydrodynamic behavior of a liquid flow calculated on its basis are given in the article. Comparison of theoretical and experimental data on a liquid flow rate through various designs of rotary-pulsed apparatus is given.

Keywords: rotary-pulsed apparatus, mathematical modeling, area of passage, flow dynamics.

SLIPPAGE OF THE VORTEX FLOW IN A PERFORATED ROTOR

A.B. Evgrafova, V.A. Plotnikov, P.T.Petrik

Presents the results of theoretical investigations of hydrodynamics of vortex flow in a perforated rotor with gas cavity: dependence of the coefficient slippage on the intensity of injection, relative radial profile of the peripheral speed of the rotor, the distribution of the relative pressure in the rotor. The solution allows to receive in explicit form expression for the calculation of the coefficient slippage at the phase interface.

Keywords: slippage, vortex flow in a perforated rotor, calculating the coefficient of slippage.

SYNTHESIS SORBENTS WITH GRAFTED LAYERS ACETOACETIC AND MALONIC ESTERS CHELATES FOR GAS CHROMATOGRAPHY

E.A. Pakhnutova, Yu.G. Slizhov, G.L. Ryzhova

Synthesized helate packing chromatographic sorbents with grafted layers of nickel - malonic and acetoacetic esters by successive assembly on the surface of the carrier through the chlorination stage of silica gel. Their structural and chromatographic characteristics of physical and chemical methods. It is shown that the obtained is sorbents can be used in gas chromatography for separation of light olefin, aromatic, saturated hydrocarbons and alcohols, aldehydes and ketones.

Keywords: gas chromatography, acetoacetic ester, malonic ester

OBTAINING OF POROUS GEOMETRICALLY MODIFIED SILICAGELS FOR GAS CHROMATOGRAPHY

A. I. Makarycheva, J. M. Volkova, Y. G. Slizhov, G.L Ryzhova

The geometrical modification of the surface of silicagel was executed by method of hydrothermal treatment. Structural characteristics of modified specimens were investigated and established that the conducted treatment with the water steam under elevated temperature and pressure decreases the surface area and leads to widening of silicagel`s pores. The quantitative assessment of chromatographic properties and potentials of their application in gas chromatography as sorbents for separation of hydrocarbons and organic oxygen-containing compounds were executed.

Keywords: gas chromatography , silicagel, geometrical modification, hydrothermal treatment.

TRILONOMETRIC TITRATION WITH BISMUTH ELECTRODE

R.A.Terentyev, V.K. Chebotarev, A.E. Paseka, E.G. Ilina, K.V. Shaporenko

The procedures of potentiometric titration of Bismuth(III), Zinc(II), Copper(II), Lead(II) using prevalent complexone Disodium EDTA were developed. An bismuth metal electrode has been used as indicator. This procedures have more wide range of working pH than visual methods have. Range of determined concentrarations are 13 - 420 µg/ml of Bismuth(III) with errors up to 1%, 4 - 13 µg/ml with errors up to 3%; 14 - 708 µg/ml of Zinc(II) with error in determining less than 1%; 0,14 – 2,3 µg/ml of Lead(II) with errors up to 1%; 32 - 660 µg/ml Copper(II) with errors less than 1%.

Keywords:Bismuth, Zinc, Copper, Lead, Titrimetry, Potentiometry, Trilonometry, Disodium EDTA, Bismuth Electrode

PROBLEMS OF INCREASE OF SELECTIVITY AND CONVERSION IN INDUSTRIAL PROCESS OF OXIDATION OF CYCLOHEXANE

S.V.Puchkov, Ju.V.Nepomnyaschikh, E.S.Kozlova, A.L.Perkel, T.F.Gorbachev

Applying received in this work and literary data on relative reactivity of all types of CH-bonds of cyclohexane and its derivatives modeling of industrial process of oxidation of cyclohexane is carried out. It is shown that existing ideas of expediency of oxidation of cyclohexane in cyclohexanone need revision as in this case the increase in conversion is accompanied by decrease in selectivity. Therefore, conducting process towards primary formation hydroperoxycyclohexane and cyclohexanol is preferable.

Key words: cyclohexane, selectivity, conversion, hydroperoxycyclohexane, cyclohexanol, cyclohexanone, liquid-phase oxidation, reactivity

HYDROGENATED NITRILE-BUTADIENE RUBBER SYNTHESIS BY NON-CATALYTIC METHOD AND TESTING IN RUBBER MIXTURES

N.M. Shcheglova, V.D.Kolesnik, Y.R.Nosikova, S.V.Turenko

Hydrogenation of nitrile-butadiene rubber latex was carried out with hydrazine and hydrogen peroxide. Special additives were used during hydrogenation to reduce gel formation. Practically feasible hydrogenated rubber was obtained with a degree of hydrogenation of 96%. Vulcanized rubbers derived from the test samples and their physical and mechanical properties were studied. It is shown that the experimental vulcanizates have a high level of strain-strength properties and thermo-, benzo-, oil-resistance.

Keywords: hydrogenated nitrile-butadiene rubber, hydrazine, hydrogenation, gel formation.

ANALYSIS OF MARKETING RESEARCH OF THE MARKET OF AMMONIUM NITRATE AND ASSESSMENT OF PROSPECTS FOR INCREASING PRODUCTION

V.V. Medvedev

The analysis of market research porous ammonium nitrate, citing projections that determined the development trend of the market. Assessment of prospects of continuous increase in production of porous ammonium nitrate on the basis of operating units of ammonium nitrate. Keywords: explosives, porous ammonium nitrate, nitrate, production, product quality, bulk density, caking, confining schaya capacity, particle size distribution, the forecast.

ACETYLATION OF SULPHATE LIGNIN AND ASPEN WOOD SYSTEM "ACETIC ACID - THIONYL CHLORIDE - TRIFLUOROACETIC ACID"

D.D. Efryushin, V.V. Kon'shin, V.J. Zonova, A.S. Rogova, O.N. Timakova, M.M. Chemeris

The reaction of hydroxyl-containing compounds with a mixture of "acetic acid - thionyl chloride - trifluoroacetic acid" derived products acetylated lignin sulfate and aspen wood, the thermodynamic parameters of the activated complex acetylation and study the structure of initial and acetylated products by IR and ^{13}C NMR spectroscopy.

Keyword: sulfate lignin, aspen, hydroxyl-containing compounds, acetylation, trifluoroacetic acid, thionyl chloride.

RESEARCH OF ACYLATION SUNFLOWER HUSK ALIPHATIC α-HYDROXY ACIDS

N.V. Koreneva, V.V. Konshin

The interaction of sunflower husk with glycolic and lactic acids. Synthesized products are selected for precipitators providing production-acylated derivatives of sunflower husks associated with a maximumof carboxylic acids.

Keywords: sunflower husks, oskikislota, acylation, nonsolvent.

NMR SPECTROSCOPIC STUDY OF THE PRESSING PROCESS MODIFIED ASPEN

D.V. Shiryaev, N.P. Musko, M.M. Chemeris, O.A. Kuldeshova

Conducted by explosive modification chips. Based on the comparison of published data and NMR spectroscopic studies it was concluded the processes in aspen wood, treatment of its vapor pressure.
Keywords: ^{13}C NMR spectroscopy, the explosive autohydrolysis, aspen, lignocarbohydrate complex.

OBTAINING SUCCINATE CELLULOSE FROM ASPEN WOOD

A.V. Protopopov, M.V. Klevzova, T.V. Dubrovskaya

The process of acylation aspen succinic acid in the presence of trifluoroacetic acid and thionyl chloride. Kinetic regularities acylation wood succinic acid in the presence of thionyl chloride in trifluoroacetic acid. The thermodynamic parameters of the acylation of the activated complex and the total energy of the activation process.
Keyword: cellulose ester, acilation

THE PROCESSES OF OBTAINMENT AND STABILIZATION OF NITROCELLULOSES FROM OAT HUSK PULP

A.A. Yakusheva, V.V. Budaeva, N.V. Bychin, G.V. Sakovich

The processes of obtainment and stabilization of nitrocelluloses from oat husk pulp were studied. The main characteristics of the esters synthesized are adduced. The purity and chemical stability of the samples have been confirmed by TGA and IR spectroscopy.
Keywords: oat husk, pulp, nitration, stabilization, autoclaving, DSC, IR spectroscopy, chemical stability

OBTAINMENT OF LIGNOCELLULOSICS FROM NON-WOODY FEEDSTOCK AND THEIR EXAMINATION AS SUBSTRATES FOR ENZYMATIC HYDROLYSIS

V.V. Budaeva[1], Ye.A. Skiba[1], E.I. Makarova[1], V.N. Zolotukhin[1], G.V. Sakovich[1], Ye.V. Udoratina[2], L.A. Kuvshilova[2], T.P. Shcherbakova[2], A.V. Kuchin[2]

The optimum conditions of obtaining lignocellulosics from oat husks and Russian Miscanthus (4% nitric acid treatment) were ascertained; lignocellulosic specimens were prepared at the pilot production in 2012. The chemical compositions of the lignocellulosics from both types of feedstock were determined. The most promising substrates for fermentation are shown to be oat husk and Miscanthus lignocellulosic specimens produced by treating the feedstock with 4% nitric acid, with the yields of reducing substances being 73-80% on a substrate weight basis.
Keywords: lignocellulosics, oat husk, Russian Miscanthus, enzymatic hydrolysis, reducing substances

ENZYMATIC HYDROLISIS OF HYDROTROPIC CELLULOSE

E.I. Makarova, M.N. Denisova, V.V. Budaeva, G.V. Sakovich

Reactionability to fermentation of the hydrotropic cellulose obtained from Mischanthus and cereal husks has been investigated. The main characteristics of the studied substrata are provided.
Keywords: hydrotropic cooking, Mischanthus, cereal husks, cellulose, enzymatic hydrolysis, "BrewZyme BGX", reducing substances.

ACYLATION OF SULPHATE LIGNIN O-AMINOBENZOIC ACID

A.V. Protopopov, Y.V. Frolova, O.V. Radkina

Researche lignin acylation of o-aminobenzoic acid in the presence of trifluoroacetic acid and thionyl chloride.
Keyword: lignin, aromatic acid, acylation.

STUDY OF FOOD PROCESSING BAROTHERMAL ASPEN OF 13C SPECTROSCOPY

D.V. Shiryaev, N.P. Musko, O.S Beusheva, O.A. Kuldeshova

Conducted by explosive modification chips. Based on the comparison of published data and NMR spectroscopic studies it was concluded the processes in aspen wood, treatment of its vapor pressure.
Keywords: ^{13}C NMR spectroscopy, the explosive autohydrolysis, aspen, lignocarbohydrate complex.

PHYSICAL AND CHEMICAL MODIFICATION HAULM OF WHEAT

N. G.Komarova, E.R.Shahtorina

In this paper we investigate the process modifying haulm of wheat dihlorodimethylsilane. The Influence of preprocessing and chemical modification of the conditions on weight gain and associated content of silicon in the modified sampes.

Keywords: sililiration, physical and chemical modification, dihlorodimethylsilane, haulm of wheat.

ACYLATION WOOD SYSTEM OF "ACETIC ACID - HIGHER CARBOXYLIC ACIDS - THIONYL CHLORIDE"

D.D. Efryushin,O.S. Beusheva, D.P.Fink

The treatment with a mixture of aspen "acetic acid - the highest carboxylic acid - thionyl chloride" followed by bleaching produced mixed cellulose esters. The structure of the acylated product by IR and ^{13}C NMR spectroscopy.

Key word: aspen wood, complex mixed cellulose esters, higher carboxylic acids, lignocellulosic material, trifluoroacetic acid, thionyl chloride.

SYNTHESIS OF ACETONLIGNIN FROM *MISCANTHUS SINENSIS*

S.G. Ilyasov, V.A. Cherkashin, G.V. Sakovich

We report that the thermal treatment of mixed Miscanthus stems and leaves under pressure in water results in hydrolysis of the biomass and favors the extraction of lignin from the lignocellulosics with boiling acetone under atmospheric pressure. The content of the carboxylic (keto) group within the structure of the macromolecule was identified by IR and NMR spectroscopic methods. The resultant acetonlignin possesses properties of a thermoplastic material.

Keywords: Miscanthus sinensis, hydrothermal treatment, depolimerization, acetonlignin, thermal plasticity.

EVALUATION OF QUALITY SAMPLES BUTTER BY DIFFERENTIAL SCANNING CALORIMETRY AND THERMOMECHANICAL ANALYSIS

A.L. Vereshchagin, N.V.Bychin, L.N. Afanasieva, E.O.Volkova

Developed a method of identification of butter by differential scanning calorimetry and thermomechanical analysis. The analysis of the authenticity of the samples sold in retail Altai region for the presence of vegetable fats.

Keywords: butter, differential scanning calorimetry, thermomechanical analysis.

RESEARCH INFLUENCE OF CONDITIONS OF SEPARATION INVERT SYRUP AND PRODUCTION SATURATED FRUCTOSE SYRUPS ON THE CONTENT OF DEGRADATION PRODUCTS OF SUGAR

L.A.Bakholdina, V.I.Shesternin, A.L.Vereschagin

Influence of conditions of separation invert syrup and production saturated fructose syrups on the content of 5-hydroxymethylfurfural was studied.

Keywords: 5-hydroxymethylfurfural, invert syrup, isopropanol, acetone.

PROPERTIES OF SEA BUCKTHORN OIL, OBTAINED BY ENZYMATIC HYDROLYSIS

Goremykina N.V., Vereshchagin A.L., Koshelev Yu.A.

The paper presents the comparative results of the study of physical and chemical properties of sea buckthorn oil samples obtained by extraction and enzymatic method.

Keywords: sea buckthorn oil, fermentation, extraction, the residual amount difluorochloromethane.

ECOLOGICAL-GEOGRAPHICAL ASSESSMENT OF ALTAI KRAI ON THE EVE OF 2013- UNITED NATIONS YEAR OF WATER COOPERATION AND THE YEAR OF ENVIRONMENT PROTECTION IN RUSSIA

I.N. Rotanova

Natural and anthropogenic factors determining ecological state of the territory are discussed, and the review of current ecological –geographical situation in Altai Krai is made. The necessity of formation and realization of the balanced regional system for ensuring ecological safety as a part of the state policy, and the use of 2013-United Nations Year of Water Cooperation as well as the Year of Environment Protection in Russia to achieve these goals are grounded

Keywords: Altai Krai, environmental problems, ecological-geographical assessment, ecological safety.

LEGISLATIVE AND METHODICAL PROVIDING OF MUNICIPAL SOLID WASTE MANAGEMENT IN ALTAI REGION

L.N. Beldeeva, I.V. Dudin

This article takes a detailed look at legislative and methodical providing of municipal waste management system in Altai region. Legislation has to be adjusted and the institutional requirements have to be met as soon as possible. Recommendations to local governments on development of selective waste collection system are elaborated.

Keywords: solid waste management, selective waste collection, local governments.

DEVELOPMENT OF INTERMUNICIPAL COOPERATION IN SOLID WASTE MANAGEMENT SECTOR

L.N. Beldeeva, N.A. Berda

The problems of Intermunicipal Cooperation in solid waste management sector are considered. The main indicators for an efficiency assessment are defined to make waste collection and disposal more efficient and cost-effective; to provide more ef-

fective services with very limited municipal resources; and to contribute the first appropriate steps in developing an environmentally sound and affordable waste disposal system for the entire population.

Keywords: solid waste management, intermunicipal cooperation, waste management efficiency

PROBLEMS OF PROTECTION OF THE AIR BASIN IN COKE CHEMICAL INDUSTRY

L.A. Kormina

Focus on new technology trends clearning coke gas from ammonia.

IMPROVEMENT OF THE SYSTEM OF WATER SUPPLY OF THE LIMITED COMPANY «BARNAUL FACTORY OF RUBBER TECHNICAL PRODUCTS»

A.S. Cherkasov, V.A. Somin, L.F. Komarova

In work the analysis of system of water supply of the enterprise, technological solutions for its improvement with the use of sorbent on the basis ofbentonite clay and basalt fiber.

MODERN STATE AND DEVELOPMENT PATHS OF BURLINSKII SALT-PRODUCTION

V.V. Zatcepin, T.F. Svit

One of ways for complex processing of Burlinskoe lake brine was proposed.
Keywords: lake, galite, brine, sodium sulfate, magnesium chloride.

CLEANING ORGANOMINERAL MIXTURE OF PHENOL

T.A.Krasnova, N.S. Golubeva, O.V.Belyaeva

This paper presents the results of a study of adsorption of phenol in the presence of mineral salts with activated carbon SKD-515 in static and kinetic conditions. It is show that the presence of minerals in solution affects the adsorption capacity and increases the rate of mass transfer process of phenol.

SOLUTIONS TO THE PROBLEM OF WASTEWATER TREATMENT/PURIFICATION OF A DIARY ENTERPRISE

M.A. Poletaeva, O.S. Osadchaja, N.A. Rusaeva

The research contains analysis of the drainage system of a Barnaul dairy plant. It analyses qualitative indicators of the plant's wastewater as well as a possibility of separate sewage purification. We suggest ways of water supply and drainage systems transformation including separate purification of sewage subject to its origin and partial reversion of purified sewage. Experimental research into the saline brine purification were carried out.
Keywords: brine purification, ultrafiltration, wastewater of dairy plants.

STUDIES ON THE ESTABLISHMENT OF ECOLOGI TECHNOLOGY PROCESSING NAPHTHALENE IN THE COKE INDUSTRY

O.M.Gorelova, M.Y.Grigorova

The paper discusses the basic problems of processing methods and naphthalene fraction of coal tar. The results of the research division of the rectification naftalinosoderzhaschego raw materials without chemical pretreatment/
Keywords: naphthalene, rectification, thionaphthene, energy saving technologies.

RESEARCHES OF THE RECEIVED A NEW SORBENTS FROM VEGETABLE RAW MATERIALS FOR WATER TREATMENT

V.A. Somin, V.M. Osokin

In the work the method of receiving of a sorbents on the basis of the woodworking industry waste and plant growing for treatment of sewage water from compounds of metals are considered. Sorption capacity of various materials on copper and nickel ions is studied.

DERIVING OF ACTIVATED CARBONS FROM PINE NUT SHELL

A.V. Bogaev, I.A. Lebedev, D.F. Karchevsky, D.A. Berectennikov, O.O. Vtorushina

The article presents an overview of the properties and applications of activated carbons. It contains comparative characteristic of activated carbons derived from pine nut shell by combined carbonization/ activation in a thermal-oxidative front created by an air blast.
Keywords: activated carbon, sorbents, adsorption activity, deriving sorbents, mesopores, micropores, basic properties of sorbents.

ABOUT THE ADSORPTION MECHANISM DIMETILAMIN ACTIVE COALS

T.A.Krasnova, N.V.Solovev

Complex research of adsorption dimetilamin from water solutions is conducted by active coals. On the basis of experimental and settlement results of process of adsorption, the data electrometric titration, the analysis of porous structure of active coal before adsorption features adsorption interactions dimetilamin with a coal surface are revealed.
Keywords: active coal, dimetilamin.

CHANGE THE PROPERTIES OF BENTONITE CLAYS UNDER THE INFLUENCE OFVARIOUS ACTIVATORS

The paper presents a study on the bentonite clays of different fields and the impact of activation on their composition and properties. The analysis of the absorption spectra of infrared rays bentonites different fields and types of activation.
Keywords: water hardness, bentonite clay, IR-spectroscopy

DEVICE FOR WATER TREATMENT FROM OIL POLLUTION IN SMALL RIVERS USING PLANT WASTES

A.N. Romanov, M.V. Kulikova

A device for treatment of surface water from oil and oil products in small rivers is proposed. The results of field experiments show that the efficiency of water treatment depends on the level of its initial contamination.
Keywords: water treatment in small rivers, treatment of sewage and storm sewage water, sorbents, oil products, gramineous straw

THE SYNTHESIS AND INVESTIGATION OF CRYSTALLOGRAPHIC AND ADSORPTION PROPERTIES OF TIO_2 POWDERS

Stepanov A.Y., L.V.Sotnikova, A.A.Vladimirov, D.V. Dyagilev, F.V.Titov, T.A.Larichev

The technique for the TiO_2 photocatalyst manufacturing with titanium tetrachloride alcoholic solution using was revealed. The ammonium titanate precursor was precipitated by double-jet method with $TiCl_4$ alcoholic and ammonium aquatic solutions using. The TiO_2 nanopowders were prepared by precursor's calcinations at 400, 500, 600, 700 and 800^oC. The difference in adsorption ability of TiO_2 dispersion reference to organic dyes was found. The synthesis conditions (pH and temperature) influences on TiO_2 powders crystallographic properties and dyes adsorption were investigated.
Keywords: nanocrystalline titanium dioxide, anatase, synthesis, titanium chloride, dyes adsorption

TOXIC METALS ANAIYSIS IN PHARMACOPEIA BY POTENTIOMETRIC TITRATION

R.A.Terentyev, V.K. Chebotarev, A.E. Paseka, E.G. Ilina, K.V. Shaporenko

The procedures of potentiometric titration with bismuth indicator electrode were developed to remove for shortcomings of visual titration used in pharmacopeia for analytical monitoring of toxic metals. The increased convergence and correctness of results in comparison with visual titration has been shown by the example of medicine contained Zinc(II) and Bismuth(III). Times of potentiometric analysis were commensurable with times of visual titration.
Keywords: Pharmacopeia, Titration, Potentiometry, Trilonometry, Disodium EDTA, Bismuth Electrode

HEAVY METALS IN SEA BUCKTHORN BERRIES AND FLAX SEEDS

O.M. Melnikov, N.I.Kuleshova, A.L.Vereshchagin

The content of heavy metals in sea buckthorn berries and flax seeds were determined by atomic absorption spectrometry. It was established an excess of cadmium in seeds of flax grown in certain areas. It was been proposed two most probable causes of accumulation of cadmium in the flax seeds.
Keywords: method of atomic absorption spectrometry, cadmium, flax seed, sea buckthorn berries.

THE SOLUTION OF QUESTIONS OF RESOURCE-SAVING IN THE COURSE OF THE FLEXOGRAPHY

Y.S.Lazutkina, O.M.Gorelova, M.A.Kompanetc

In work results of studying of process of a flexography are presented. Types of the flexographic press, applied solvents, ways of regeneration of the fulfilled solvents are considered. The main physical and chemical properties of individual components of solvent and its binary components are studied.
Keywords: flexography, rectification, solvent.