CONTENTS, ABSTRACTS AND KEYWORDS OF PAPERS

IMPROVEMENT OF THE RANGE OF CONFECTIONERY FOR SPECIAL PURPOSES

I.Ju. Reznichenko, N.N. Zorkina, E.Ju. Egorova

The article is devoted to the problems extension of assortment and development of new special confectionery products. The authors developed a recipe and technology of the new biscuit semi-finished product with sorbitol, which is suitable for consumers with disorders of carbohydrate metabolism.

Keywords: specialized confectionery products, confectionery, carbohydrate metabolism, diabetes mellitus, biscuit, sorbitol.

THE IMPACT OF THE BAD «PANTORIN» ON CONSUMER PROPERTIES OF BAKERY PRODUCTS

S.S. Kuzmina, L.A. Kozubaeva, E.Ju. Egorova

The work investigated the influence of BAD «Pantorin» on the formation of consumer properties of bakery products. It is established that the use of BAD «Pantorin» in the form of an aqueous solution concentration 30 % at the stage of kneading of the dough can improve the quality and extend the shelf life of bakery products.

Keywords: bakery products, BAD «Pantorin», antlers, nutritional value, quality indicators, get stale.

INNOVATIVE DEVELOPMENT OF CATERING IN THE REGIONAL CONDITIONS

S.V. Novoselov, L.A. Maurnikova, E.A. Mashenskaya, A.S. Novoselov

The findings state catering to the conditions of the Kemerovo region has revealed the need to improve their performance. It is shown that for the development of the market catering is urgent to develop and implement innovative projects and programs. To develop innovative projects suitable systematization of the main factors forming elements in the current activities of enterprises. As factors forming elements offered: marketing, the company's budget, pricing, interior, inventory, technological level of production. A description of the business process catering (PC) in regional terms. Formed the integrated system of quality control and management in the region through PC of science and education-production market.

Keywords: catering, analysis of the activity of enterprises, factors forming elements, business process, innovative development, the economic growth, innovative project.

DETERMINATION OF TECHNOLOGICAL PARAMETERS OF QUALITY AND SAFETY CONFECTIONERY PRODUCTS «REVITKA» IN AN INDUSTRIAL ENVIRONMENT

A.V. Shvetsova, G.B. Pischikov

Quality – is the main component of the final product when any buyer. The quality depends caramel demand for these products. The higher the quality, the greater the demand. Quality caramel valued at the current technical regulations [3, 8]. Quality caramel estimated organoleptic (color, taste and smell, the surface form), on the physico-chemical parameters. Results matching the con-ray products, «Revitka» regulated indicators of food safety, as well as the defined terms and conditions of storage.

Keywords: pastry, microbiological criteria, food safety, conditions of storage, shelf life.

DEVELOPMENT AND EVALUATION OF QUALITY OF NEW FUNCTIONAL PURPOSE CARAMEL «REVITKA»

A.V. Shvetsova, G.B. Pischikov

Currently, the most promising direction of designing preventive caramel is the use of polyols as a substitute for sugar. Products containing them, can be characterized by the term «sugar», as well as a marked feature to provide a probiotic effect. The compounding and technology of obtaining a basis for caramel "Revitka" functionality, and investigated its stability during production and storage. Regulated defined quality indicators, terms and storage modes, studied the chemical composition and nutritional value of preventive caramel produced by innovative technology. The recommendations for its use.

Keywords: glucose syrup, isomalt, candy, vitamins, biologically active substances, caramel base, confectionery, hygroscopicity, efficiency, stability and safety.

RESEARCH OF REGIONAL FLAVOURING PREFERENCES OF CONSUMERS AT ADVANCE ON THE MARKET OF THE INNOVATIVE FOOD PRODUCT

M.N. Vishnyak, E.A. Mashenskaya, A.V. Mikhaylov, A.S. Novoselov

We Developed criteria to assess the taste preferences of consumers using methods and algorithms based on database theory and operations of mathematical logic. The results of the study the taste preferences of the consumers of Barnaul.

Keywords: regional, taste, preference, market, evaluation, selection, innovation, product, food, group, criteria.

MODELING OF OPERATIONAL PROPERTIES OF PARTS (DETAILS) MADE OF SPECIAL CAST IRON CHMN-35M

A.V. Gabets, A.M. Markov, D.A. Gabets

Slides cap is a heavily loaded exchangeable part installed in the carriage of freight car (wagon), because of the low service properties of the steel cap is suggested the use of cast-iron as an alternative material. Cast-iron with high wear resistance is produced by alloying of cast-iron SCh35 with molybdenum and nickel in the modification of barium, zirconium, calcium and aluminum.

The researches of the resulting alloy has shown that its mechanical properties car fully provide the necessary wear resistance and increased strength characteristics, but the material structure allows to improve the friction option of tribocombination of friction pairs nodes in the carriage of freight car.

With the help of computer modeling it was made the strength analysis of the construction of cast-iron slides cap in the various of operation.

Keywords: slides cap of the freight-car truck, grey cast-iron SCh35, cast-iron SChN-35M, alloying and modification of cast-iron, strength analysis, microstructure, mechanical properties, durability.

METHODS OF ANALYSIS OF DYNAMIC PROCESSES IN THE DETAILS OF THE INTERNAL COMBUSTION ENGINES

V.S. Popovich, A.A. Zherdev, R.E. Pestretsov

In the article considers the results of the experimental analysis of the exploration of dynamic processes of parts of diesel engines, developed and tested a complex methodology for determining the optimum parameters of dynamic torsional motors systems.

Keywords: diesel engines, torsional vibrations.

THE DEFINITION OF THE PERIOD OF DURABILITY OF THE ABRASIVE POWDER IN THE PROCESS OF MAGNETIC ABRASIVE MACHINING MATHEMATICAL MODELLING

R.V. Grebenkov, E.Y. Tatarkin, A.M. Ikonnikov

The authors presented a method for determining the lifespan of a cutting tool for magnetic abrasive finishing. In the model considered the geometry of the cutting grains of powder and the kinematics of their movement through the work piece. Over time cutting properties of the abrasive grains decrease due to their deterioration and destruction. Quantification of the time when the cutting properties of the powder reach the bottom limit, it is advisable to change the magnitude of the removal of processed material.

Key words: magnetic abrasive machining, removal of material, the period of resistance, mathematical modeling, wear powder.

FORECASTING OF GEOMETRICAL PARAMETERS OF THE SURFACE QUALITY OF MACHINE PARTS FOR PROCESSING BY THE CUTTING TOOL

V.A. Khomenko, S.L. Leonov, A.O. Cherdantsev, P.O. Cherdantsev, A.V. Dybaylo

Authors presents method of building mathematical model of face cutting process based on forecasting of geometrical parameters of the surface quality by analyzing topography.

Keywords: imitation simulation, cutting, CAM-systems, CAE-systems, CNC-machine, surface quality, cutting process.

RESEARCH OF DURABILITY OF PRODUCTS, RECEIVED BY METHOD 3D-PRESS

A.V. Balashov, A.O. Cherdantsev, E.A. Novikovsky,
S.V. Ananyin, S.V. Beloplotov

It is considered extrusive the 3Dpress. Dependence of specific weight of material of a sample on percent of filling of material is defined at 3D-press. Influence of percent of filling with detail material on strength at a bend is investigated.

Keywords: the 3D-press, an extrusive method, ABS plastic, strength at a bend, the specific weight, filling percent.

METROLOGICAL ASSURANCE OF DEVICE CAP-10.1

S.V. Mazikov, G.V. Vavilova

The appearance of the device CAP-10 is showed, and its operating principle is described. The technique of the device CAP-10 initial adjustment is proposed. It provides the desired function of the output signal transformation. The technique of the «operating» adjustment to correct measurement results through systematic measurement error elimination is offered. The specially prepared segments of the tested wire with known values of the capacitance per unit length are used for the initial and «operating» adjustment.

Keywords: initial adjustment, calibration, «operating» adjustment.

QUALITY CONTROL OF THE SEAM FORMED AT ULTRASONIC WELDING OF THERMOPLASTIC MATERIALS

V.N. Khmelev, A.N. Slivin, A.D. Abramov, M.E. Vakar

The article presents the results of development of the stand for quality control of the weld formed by ultrasonic welding. Proposed, developed and practically used stand enabled the control of the process of formation of the weld seam at ultrasonic welding. The results allowed us to visually investigate the process and set the welding for maximum seam quality.

Keywords: ultrasound, welding, process, thermoplastic, monitoring, welding seam, quality.

EXPERIMENTAL DETERMINATION OF THE LOCAL THICKNESS OF THE CONDENSATE FILM OF WORKING FLUID IN A SHORT LOW-TEMPERATURE RANGE HEAT PIPES

A.V. Seryakov

The description of the automated capacitive meter of local thickness of the of condensate film of working fluid in a short low-temperature range heat pipes are presented. Presents design, calculation of the capacitance of the open compact capacitive sensors, the calibration results, as well as electronic equipment, allowing us to carry out measurements of local thickness of the working fluid film on the condensation surface within heat pipes (HPs).

The measured average time values of the condensate film thickness is depending on the heat load on the capillary-porous evaporator. The measurement error does not exceed $2 \cdot 10^{-3}$ mm. It was shown that the condensate film thickness of the working fluid decreases sharply with increase of heat load on the evaporator in the short low-temperature range HPs.

Keywords: capacitive sensors, condensate film thickness, high-frequency generators, heat pipes.

INTEGRATION OF CAVITATION MODE CONTROL SYSTEM INTO ULTRASONIC TECHNOLOGICAL EQUIPMENT

V.N. Khmelev, R.V. Barsukov, E.V. Ilchenko, D.V. Genne

The article is devoted to the integration of cavitation control system into the ultrasonic technological equipment designed for liquid technological media processing. Results of experimental studies of developed system efficiency are provided.

Keywords: ultrasound, electronic generator, load, control, cavitation.

EXPERIMENTAL INVESTIGATION OF THE APPLICABILITY OF THE METHOD OF SPECTRAL PYROMETRY FOR THE TASK FOR RAPID FIRE DETECTION IN DUST-GAS-AIR ENVIRONMENTS

M.N. Zyryanova, E.V. Sypin, S.A. Lisakov

The article describes the results of experiments that aim to study the possibility of using the spectral pyrometry method for fire detection in dust-gas-air environments. The study was conducted in laboratory conditions using the ideal radiation source. It is established that the method can be used to detect fires in dust-gas-air environments.

Keywords: pyrometry, spectrum, radiation source, the fire seat, technique.

EXPERIMENTAL RESEARCH OF OPTICAL RADIATION ATTENUATION IN DISPERSED SYSTEM «COAL DUST-AIR»

S.A. Lisakov, A.N. Pavlov, E.V. Sypin, G.V. Leonov

Experimental research of optical radiation attenuation in dispersed system «coal dust-air» is executed. The method of coal dust preparation with set dispersity and method of research carrying out are developed. The block diagram of laboratory setup is offered. Experimental dependences of absorbance in dispersed system «coal dust-air» from wavelength at various concentration of coal dust and experimental dependences of absorbance from concentration of coal dust are obtained. Data about experimental absorbance and results of theoretical calculations are coordinated with each other. The computer model on the basis of Mie theory is adequate.

Keywords: optical radiation, dispersed system, attenuation, experimental research.

EXPERIMENTAL INVESTIGATION OF THE COMPENSATION METHOD FOR INCREASE OF THE NOISE STABILITY OF EXPLOSION DETECTION EOS

A.I. Sidorenko, S.A. Lisakov, E.V. Sypin

The article describes features of use of a compensation method of optical noises suppression for the explosion detection electro-optical systems. Results of experimental investigation of compensation method efficiency are given.

Keywords: electro-optical system, optical noises, compensation method, experimental investigation.

THREE-CHANNEL OPTICAL-ELECTRONIC DEVICE OF TWO SPECTRAL RATIOS

N.Y. Tupikina, E.V. Sypin, S.A. Lisakov, E.S. Povernov, A.N. Pavlov

The three-channel optical-electronic device of two spectral relations is described in article. The theoretical construction principles of the device are formulated. The technical solutions for device implementation were worked out by the results of the carried out computer simulation. Carrying out tests of the developed device became the end of work. The result was the testing of the developed device.

Keywords: optical-electronic device, fire source, noise.

DEVELOPMENT OF FIRE ROBOT BASED ON QUADCOPTER

V.A. Shadrin, S.A. Lisakov, A.N. Pavlov, E.V. Sypin

Article describes basic decisions on construction of the fire robot based on a quadcopter. The fire robot carries out patrol of a premise for detection of a fire and its liquidation. The basic technical requirements are formulated for the fire robot. The block diagram and constructive blocks for robot realization are offered. Hardware of the fire robot movement control system and method of video signal processing for fire detection are chosen.

Keywords: quadcopter, fire, fire robot, fire extinguishing.

USE OF CURVATURE DETECTORS FOR OVERLAPPED IMAGES COORDINATE BINDING IN THE SCANNING PROBE MICROSCOPY

P.V. Gulyaev, Yu.K. Shelkovnikov, A.V. Tyurikov, S.R. Kiznertsev

The article is devoted to application of image peculiarities detection methods and calculation a relative shift of two overlapping images in scanning probe microscopy. The application of statistical methods for image peculiarities detection is considered. It is shown that correlation method for image peculiarities detection has a certain restrictions. The method of allocation of special points based on detectors of curvature of a surface is offered. Operation results of the given methods and recommendations about its further application are described.

Keywords: scanning probe microscope, image analysis, surface local curvature, curvature detector, spherical detector.

CLASSIFICATION OF NOISY STM-IMAGES WITH USE OF THE OF FUZZY LOGIC TECHNIQUE

S.I. Lipanov, E.Yu. Shelkovnikov, A.V. Tyurikov, P.V. Gulyaev, N.I. Osipov

In the paper the technique of classification of noisy STM-images of nanoparticles based on algorithm of the fuzzy conclusion is offered. The knowledge base for samples of STM-profilograms is constructed. Examples of automatically calculated membership functions for entrance and output variables and results of classification noisy test profilograms of topographical STM-images are given.

Keywords: the scanning tunnel microscope, nanoparticles, classification of STM-profilograms, fuzzy logic, membership functions.

SUPERCONDUCTING Q-BIT STATE SHIFT DETECTION BASED ON STATISTICAL DATA PROCESSING

S.E. Radchenko, A.V. Krivetsky, D.K. Pitsun, A.B. Petukhova

Uniformly the most powerful invariant stochastic algorithm was developed to detect superconducting quantum bit state shift using the contrast change in the resonant frequency of the associated RF resonator. Detection of the frequency change is based of testing of statistical hypotheses concerning the parameters of the linear approximated phase-frequency characteristics of the resonator. Statistical simulation results proved the efficiency of the algorithm supposed using small sample sizes and confirmed the possibility of its practical application.

Keywords: stochastic detection algorithm, probability density distribution, q-bit, phase-frequency characteristic.

HIGH-SPEED ELECTRO-OPTICAL DEVICE FOR DETERMINING OF ADULTERATED HONEY

K.A. Kovshova, S.A. Lisakov, E.V. Sypin

Article describes a method for determining the difference of adulterated and natural honey by spectral analysis. Features of the method are formulated. The technique of carrying out research, design of laboratory setup and the block diagram of a household appliance were developed. Spectral characteristics transmittance transmittances of the honey were received a result of an experimental study. Product was received from honey and sugar syrup by interfusion. The comparative analysis of the received spectral characteristics transmittance was carried out.

Keywords: optoelectronic devices, chemical composition, honey, fructose, sucrose, spectral analysis.

THE PHOTOGRAPHIC PROCESS IN THE PRODUCTION CYCLE OF ELECTRONIC EQUIPMENT

Yu.S. Karbina, I.V. Plotnikova, O.V. Galtseva, E.Yu. Eliseeva

The quality of modern electronic products is considered as a complex indicator, which depends on the general scientific level of development projects, quality of electronics, perfection of technologies and metrological support of production. Therefore, the problems of the quality of electronic products must be addressed at the earliest stages of development processes. Improving the quality control of electronic products is accomplished by the implementation of the process of photographic devices.

Keywords: electronic products, quality control of electronic products, photographic recording, production cycle, standard photographic process, technological instruction.

THE OPTICAL INTERFERENCE MEASURING MEANS OF SMALL MOVEMENTS OF THE SURFACES OF OBJECTS OF CONTROL AND MAIN DIRECTIONS OF THEIR IMPROVEMENT

I.P. Miroshnichenko

Describes the results of development and design-experimental substantiation of funds for non-contact measurement of small displacements of the surfaces of objects of control in the interests of creating advanced high-precision optical measuring instruments and technologies for diagnostics of materials and products at all stages of their life cycle, the main directions for their further improvement.

Keywords: laser interferometer, interference pattern, the measurement of small displacements, the surface of the object of control, diagnostics of the state.

THE METHOD OF SYNCHRONIZATION FOR SPATIALLY SEPARATED DEVICES IN THE SYSTEM OF GENERATION AND DISTRIBUTION ENCRYPTION KEYS

A.V. Karpov, A.D. Smolyakov, I.R. Lapshina, A.A. Galiev

The system of generation and distribution of encryption keys creates secret key based on the results of measurements of random carrier phase of received signal. In the paper we describe the method of wireless synchronization of spatially separated encryption key generation devices. This method uses short and long-term instability values of reference frequency standards to maintain their phases and frequencies in correspondence with high accuracy. The proposed synchronization method is based on the exchanging of test sounding signals between the devices.

Keywords: encryption key, measurement, signal phase, frequency standard, frequency instability, phase mismatch standards, synchronization.

INFRARED SPECTROSCOPIC STUDY OF STRAW SPECIMENS OF CEREAL CROPS AND HYDROTROPIC PULP ISOLATED THEREFROM

M.N. Denisova, L.N. Kadulina

The paper reports the results of the study into structural features of cereal crop straw specimens (wheat, oat) and hydrotropic pulp isolated therefrom by infrared spectroscopy. Treating the straws with hydrotropic chemicals was shown to result in concentrated pulp and removal of much of non-cellulosic components, which is confirmed by IR spectroscopy data. The spectra of the hydrotropic pulps obtained from wheat and oat straws are identical in basic absorption bands to those of pulp obtained from conventional raw materials.

Keywords: IR spectroscopy, wheat straw, oat straw, hydrotropic treatment, pulp.

INVESTIGATION OF THE INNER CIRCULATION OF SOLID PHASE IN A PULSATORY FLUIDIZED BED

A.N. Atyasov, M.S. Vasilishin

Results of experimental investigation of influence of technological parameters of impulse fluidization of silicagel bed and construction features of gas-distributing grid on the value of material circulation flow-rate in the working chamber.

Keywords: pulsating bed, circulation flow-rate of solid phase.

APPLICATION OF OIL AGGLOMERATIONPROCESSING SOLID CARBONACEOUS WASTE

A.V. Papin, A.Y. Ignatova, E.S. Zlobina

Solid hydrocarbon waste source of man-made pollution. Oil agglomeration method to reduce the ash content of the raw material, get oil-coal concentrate. By calorie this concentrate it is not inferior to ordinary coal and can be used as a supplement to, or raw materials for the production of composite fuels.

Keywords: hydrocarbon waste, coal sludge, coke dust, oil agglomeration, oil-coal concentrate, processing, fuel briquettes.

STUDY INTO THE WASHING EFFECT OF HYDROTROPIC PULP ON BASIC CHARACTERISTICS OF THE FINAL PRODUCT

M.N. Denisova

The effect of washings of a pulp obtained by the hydrotropic pulping on the yield and basic characteristics of the final product was studied. The water washing was shown to cause lignin to deposit on the cellulose fiber. To produce a higher quality pulp, the washing should be carried out with the hydrotropic liquor – however, the reagent consumption rises per pulping process. The pulp samples, after they were washed with diluted NaOH solution, were comparable in quality attributes with those washed with the hydrotropic liquor. Replacing the hydrotropic liquor by the diluted alkaline solution will allow the reagent usage and pulping time to be reduced.

Keywords: Miscanthus, hydrotropic delignification, pulp, lignin, pulp washing.

CELLULOSE ESTER WITH AROMATIC HYDROXY ACIDS OF OATS FRUIT COAT

A.V. Protopopov, S.A. Bobrovskaya, A.V. Voroshilova, M.V. Klevtsova

This paper examines obtain cellulose esters of ortho- and meta-hydroxybenzoic acid in thionyl chloride environment. The kinetics of acylation shell oats and calculated thermodynamic parameters of transition complex.

Keywords: cellulose esters, acylation, grain processing waste.

CHEMICAL MODIFICATION OF SHELLS SEEDING OATS, AVENA SATIVA, BY EXPLOSIVE AUTOHYDROLYSIS

A.A. Beushev, Y.G. Skurydin, E.M. Skurydina, O.S. Beusheva, A.N. Afankov, Y.J. Nogba, V.V. Konshin

Using explosive autohydrolysis method performed chemical modification of oat seed shells. The chemical composition of the products obtained by chemical analysis and 13 C-NMR spectroscopy. On the basis of data made the assumption that the chemical processes occurring during the processing of vegetable raw materials in superheated steam-dyanym.

Keywords: explosive autohydrolysis, oat hull, chemical modification, a condensation reaction, board materials.

PREPARATION OF CELLULOSE ETHER WITH SULPHO AND BENZOIC ACID FROM THE SHELL OATS

M.V. Klevtsova, A.V. Protopopov

In this paper we study the chemical modification of oats shell benzoic and sulpho-acids by acylation to produce cellulose esters. A comparative analysis of acylating systems and choose the best for cellulose esters. The characteristic of the obtained cellulose esters with benzoic acid and sulfosalicylic data based on light microscopy.

Keywords: cellulose esters, acylation, grain processing waste.

FUNDAMENTALS OF INTEGRATED CONVERSION OF NON-WOODY PLANT BIOMASSINTO HIGH DEMAND PRODUCTS IN SMALL-VOLUME PROCESS EQUIPMENT

V.V. Budaeva, I.N. Pavlov, E.A. Skiba, O.V. Baibakova, M.S. Vasilishin, Yu.A. Gismatulina, M.N. Denisova, O.S. Ivanov, E.I. Makarova, V.N. Zolotukhin

The integrated conversion of plant biomass, biorefining, is being developed in all the countries. The present study provides a rationale for the choice of a raw material and systematizes IPCET SB RAS achievements in the art of chemical and biotechnological transformations of non-woody plant biomasses into high demand products: cellulose and its esters; paper, including specialty paper; enzymatic hydrolyzates and products from their microbiological transformation such as ethanol and microbial cellulose. The scientific novelty of designing the modular apparatus implies a new technology solution for the transformation of readily renewable biomass available in Altai Krai into marketable products. The fundamentality of this research consists in scientific-theoretical validation of the feasibility of scaling up the complicated processes that combine chemical and microbiological principles of the impact on biomass and semi-products. The findings will allow the work to be evolved into new phases such as R&D and industrial adaptation.

Keywords: process equipment, flowsheet, integrated conversion, oat hulls, Miscanthus, cellulose, paper, esters, enzymatic hydrolyzate, ethanol.

X-RAY ANALYSIS OF THE HYDROLYZED LARCH WOOD

A.A. Beushev, Y.G. Skurydin, E.M. Skurydina, O.S. Beusheva, V.V. Konshin

The method of wide angle X-ray diffraction analyzed the nature of changes in the crystal structure of the complex lignocelluloses larch subjected autohydrolysis explosion and subsequent hot pressing composite in-insulating material. It was found that the decrease in the degree of crystallinity of the hydrolyzed material compared to the original wood is up to 30 %, the effective size of the crystallites is reduced by 20 %. Hot pressing digested pulp in order to obtain the composite material does not result in further changes in Cree-crystalline structure.

Keywords: explosive autohydrolysis, larch wood, cellulose, X-ray structure analysis, the degree of crystallinity.

POROUS BOARD MATERIALS FROM THE MODIFIED METHOD EXPLOSIVE AUTOHYDROLYSIS PLANT WASTE

N.P. Musko, D.W. Shiriaew, E.S. Shahmaew

Presents the results of the production of porous materials based on modified method of explosive autohydrolysis pine bark and wheat straw. Studied the regularities of changes of properties of materials from their conditions of production and the composition of the press-mass.

Keywords: explosive autohydrolysis, porous board materials, porosity, density, thermal conductivity.

STUDY OF THE POSSIBILITY OF OBTAINING STEEL FROM WASTE PRODUCTION THROUGH SYNTHESIS SHS

A.T. Yevtushenko, R.V. Shevchenko

Nowadays, many industrial plants have difficulty in the acquisition of tool steels and alloys due to the high cost. In this regard, relevant is the search of methods of producing such steels in factories methods that do not require large investments of money, using modern technology in addition the disposal of industrial wastes.

Keywords: the element of Mendeleyev chemical added to the charge; SHS – synthesis, self-propagating high-temperature synthesis; combustion front – alloying elements; a mixture of dust; charge – composition.

SYNTHESIS OF POROUS PERMEABLE CERAMIC-METAL SELF-PROPAGATING HIGH-TEMPERATURE SYNTHESIS-MATERIALS WITH USING ORES OF POLYMETALS INSTEAD OF RARE-EARTH ELEMENTS

A.E. Baklanov, M.S. Kanapinov, S.A. Malashina, T.V. Novoselova, A.A. Sitnikov, N.P. Tubalov

In my work it has been studied the synthesis of porous ceramic-metal material (PCMM) on the basis of oxides of iron, aluminum and ores of polymetals used for production of the filtering catalytic materials of liquid and gas environments is considered (in particular, the fulfilled gases of diesels). In case of using polymetals we don't need to use expensive rare-earth metals (RZM) as catalysts at a sedum of liquids and gas from harmful impurity. The structural phase compound has been shown also as the analysis of porosity and physical properties of the dishwasher depending on composition of used polymetals and their mass structure in furnace charge is given. The technology of receiving the dishwasher of filters catalysts is considered.

Keywords: cermets, are-earth metals, polymetallic ores, charge, pore diameter, filtration, exhaust gases.

INFLUENCE OF THE MICROWAVE OVEN OF RADIATION ON COAL THE LAYER IN THE CONDITIONS OF ASYMMETRICAL HEATWATER

Vl.V. Salomatov, V.A. Karelin, S.E. Pashenko, Vas.V. Salomatov

Construction of analytically rigorous heat transfer problems, the solution of which is usually possible only in conditions of significant simplifications. If adopted by the constancy of the electrical and technological properties of coal physical picture of the process is determined by the incident on the coal layer of a plane electromagnetic wave that generates internal heat source of the Buger law. The energy equation in the form of Fourier is solved independently of the Maxwell equations. In this formulation the solution of allocated tasks is carried out by the method of integral transformation of Laplace. For the first time on such an approach derived analytical dependences of heating of the coal layer with asymmetric boundary conditions of I, II, III kind. This information is the basis for choosing the best technology parameters of microwave heating of coal arrays.

Keywords: coal, microwave heating, electrodynamics, heat transfer, temperature field, mathematical modeling.

EXPERIMENTAL DETERMINATION OF SIZE OF THE CHARGE OF SOLID-PHASE AEROSOL PARTICLES AT ELECTROSTATIC DRAWING ON THE SURFACE

M.Yu. Stepkina, O.B. Kudryashova, A.A. Zhirnov

Methods of determination of the potential of a surface arising due to sedimentation of solid-phase charged particles of an aerosol in the electric field created by a koroniruyushchy electrode of a spray and the grounded detail on which dispersion is carried out are studied. The charge of particles at electrostatic putting various powders on a surface of various materials is experimentally investigated. Definition of a sign of a charge of aerosol particles of the studied powders which they get at influence of electric field is of special interest.

Keywords: crown category, shock charging, electrospray, potential difference, aerosol particles.

RESEARCH OF INFLUENCE OF THE ELECTROSTATIC CHARGE OF THE SURFACE ON THE REGIONAL ANGLE OF WETTING

K.V. Zhdanov, M.S. Yerokhin, M.Yu. Stepkina, A.A. Zhirnov, O.B. Kudryashova

Influence of an electrostatic charge of a surface of dielectrics on the wetting angle for some liquids (water, glycerin, lube) is investigated by method of the spreading drop. It is shown that electric charge of a surface always leads to reduction of the wetting angle, but in certain cases insignificant, and in others (glycerin on ebonite) – it is essential. Experimental dependence of a wetting angle on surface charge level is given.

Keywords: electrostatic charge, wetting angle, dielectrics, method of the spreading drop.

MODIFICATION OF POLYETHYLENE WITH CARBON NANOPARTICLES FOR THE PRODUCTION OF HIGH-STRENGTH MULTY-LAYER FILMS

Y.A. Novikovsky, M.I. Anan'ev

Modification of polypropylene was studied in the article. Composition with enhanced mechanical characteristics for the production multy-layer films was designed. A comparative analysis of various indicators, such as the tensile strength, deformation, the tear resistance was prepared.

Keywords: modification, multy-layer films, tensile strength, tear resistance.