CONTENTS, ABSTRACTS AND KEYWORDS OF PAPERS

RECIPE OPTIMIZATION OF PROBIOTIC A FERMENTED MILK DRINK WITH ADDITION OF DIETARY FIBER JERUSALEM ARTICHOKE

R.A. Drozdov, M.A. Kozhukhova, T.V. Barkhatova, A.M. Marenich

The article investigates the technological potential of the preparation of dietary fiber of artichoke and justifies the formulation of a fermented milk beverage with its use. Optimization of drink recipes using mathematics planning method Box-Behnken experiment. The result found that the addition to the milk product of dietary fiber having a particle size of 250 ± 30 microns in an amount of 2.5 kg per 100 kg of leaven and "Bifilakt-Pro" at a concentration 6% of acid provides a high speed, the duration of fermentation is not more than 6 hours, and receive functionality beverage with favorable taste properties.

Keywords: dietary fiber, Jerusalem artichokes, probiotic yeast, functional product, a fermented milk drink.

RECEIPT OF MALT FROM THE BARLEY GROWING IN THE TERRITORY OF KRASNOYARSK KRAI

Zh. A. Koch, D. A. Koch

Are researched the chemist - technological indicators of regional grades of brewing barley from the point of view of malt production. Suitability of the researched grades of grain crops for malting and receipt of malt is established.

Keywords: barley, malt, malting, sugaring ability, fermentation, brewing barley.

THE EFFICIENCY OF THE USE OF BOTANICALS IN FUNCTIONAL FOODS

A. T. Inerbaeva, V. A. Uglov, E. V. Boroday, V.A. Slepchuk

The development of technology for the production of delicacy meat products turkey meet and herbal ingredients, meat products with fine powder beet considered. The physiological role of the component of beet – betaine studied. A method of processing beet IR - drying with obtaining fine powder, resistant to storage developed. High percentage of safety of betaine compared to boiled beets proved. Shows the advantages of Turkey meat compared to beef and pork in vitamins, phosphorus, and selenium. The results of this work can enrich the food market of Russia new biologically high-grade meat products and to contribute to the improvement of the Russian population.

Key words: Turkey meat, vegetable ingredients, beet powder, betaine, IR-drying.

CUPCAKES WITH AMARANTH FLOUR

E. Ju. Egorova, P.A. Plugnikova

The article is devoted to the extension of assortment and development of new pastry products. The authors propose a formulation and technology of cupcakes prepared with partial replacement of wheat flour on flour from amaranth seeds. Studied General patterns of change in nutritional value of the new product, drawn conclusions compliance of product with regulatory requirements.

Keywords: pastry, amaranth flour, cupcakes, nutritional value, quality.

CONTENTS, ABSTRACTS AND KEYWORDS OF PAPERS

HYDRAULIC EQUIPMENT FOR CREATION OF PRELOAD IN THE EXECUTIVE DEVICE OF MACHINE TOOL

A.N. Gavrilin, B.B. Moyzes, A.I. Cherkasov, K.V. Mel'Kov, A.R. Hajrullin

The aim of the research is to study the dynamics of cutting machines units and to increase their reliability by using the devices to create a preload. The article describes the hydraulic equipment for creation of preload in the executive device of machine tool. It proposed a schematic diagram of the device showing the operating principle. The calculation method for device offered. The block diagram of the device is developed. The equation that enabled to carry out calculations and build the amplitude spectrogram is given. The conclusion about the use perspective of the developed device to eliminate backlashes in the executive devices of machine tool.

Key words: metalworking, technological system, machining quality, reliability, stiffness enhancing, backlashes eliminating, pneumatic device.

WELDED CONNECTIONS OF MEMBRANES FROM POLYETHYLENE PEND BRANDS

B.I. Mandrov, A.S. Vlesko, M. B. Kovalyov

In article, questions of application of polymeric membranes as the anti-filtration screen are considered. The main type of connection of sheets of a membrane and the applied ways of welding specified. Need of application of extrusive welding for the repair and technological purposes shown. It offered to add the applied types of welded connections with butt connections on the remaining lining

Keywords: a membrane, polymeric materials, extrusive welding, a wedge with electric heating, a wedge with heating by hot air, overlap joints, butt connection on the remaining lining.

INFLUENCE OF QUANTITATIVE INITIAL COMPONENTS CALCIUM HYDROXYAPATITE AND TITANIUM NIKELID ADHESIVE STRENGTH OF BIOCOMPATIBLE COMPOSITE COATINGS OBTAINED BY GASEOUS DETONATION SPRAYING

A. A. Popova, V.I. Yakovlev

This paper investigates the structure of composite biocompatible coating composition of calcium hydroxyapatite - titanium nikelid produced by the method of detonation-gas spraying. The influence of the quantitative content of the starting components of the powder mixture on the adhesion of the composite coating on a titanium base.

Keywords: calcium hydroxyapatite, titanium nikelid, detonation-gas spraying, composite coating, adhesive strength.

GAS POWDER CLADDING PROCESS ON THE SPESIAL BOILERS AS SOLVING OF ENERGY PROBLEMS FOR AGRICULTURE

M.V. Radchenko, Yu.O. Shevtsov, T.B. Radchenko, V.S. Kiselev

The results of coatings properties investigations, made by gas powder cladding process and technological demands as well, are present in the article.

Keywords: gas powder cladding process, coatings properties, technological demands.

DETERMINATION OF THE THERMOPHYSICAL CHARACTERISTICS OF THE MIXTURE FOR INDUCTION WELDING ACCORDING TO NATURAL EXPERIMENT

V. P. Timoshenko, V. P. Sereshev

Based on the submission of induction surfacing of hard alloys carried out mathematical modeling of thermal processes in detail, to be heated using radio frequency electromagnetic field boundary value problem of heat conduction for a homogeneous isotropic medium. Numerical solution of the problem allows recovering the thermal properties of the charge on the field experimental data.

Key words: mathematical model, heat conduction, induction surfacing of hard alloys, the temperature distribution.

RESEARCHING MEZOFERRITE STRUCTURE I N HIGH STRENGTH lOW-ALLOY STEELS

M.N. Seidurov

The paper analyzed the mezoferrite structure and conditions of formation of intermediate structures in low-alloy steels of bainitic steels. It is show that the bainite transformation is generated α-phase with a different morphology and different contents of carbon in it. The main share of α-phase is consist of the mezoferrite and fragmented ferrite-having spacing's close to equilibrium. It founded that there are two kinds of fragments of differing relative proportion of carbide phase, its size and location within the intermediate structure.

Keywords: granular bainite, fragmented ferrite, mezoferrite, doublet lines, bainitic steels.

THE USE OF ANALYSIS OF ACOUSTIC EMISSION SIGNALS OF THE CUTTING PROCESS FOR ACTIVE CONTROL THE STATE OF THE FERROMAGNETIC POWDERFOR MAGNETIC-ABRASIVE MACHINING GEOMETRICALLY-COMPLEX SURFACES OF PARTS

S.L. Leonov, A.M. Ikonnikov, R.V. Grebenkov

The authors in this paper we propose the use of the device for magnetic-abrasive machining of curved surfaces with the application of active control of acoustic emission signals during the cutting process to achieve stable quality of the processed surface details. The proposed device will be able to automatically change the radius of curvature of the working surface based on the analysis of acoustic emission signals during the cutting process, which varies over time depending on the degree of wear of the magnetic powder. With a slight change in the value of the radius of curvature of the working surface of the device, there is a change in the magnitude of the working gap between the work piece and the working surface of the magnetic inductor. In the end, creates the possibility of active control of the process of magnetic abrasive machining geometrically complex surfaces during the execution of the working program of the CNC device without making any changes.

Key words: magnetic-abrasive machining, active control, acoustic emission, geometrically complex surface, the magnitude of the working gap.

DESIGN OF OPERATION OF FACE MILLING WITH PROVIDING THE CURVE OF RELATIVE BASIC LENGTH OF THE PROFILE

V.A. Khomenko, S.L. Leonov, A.O. Cherdantsev, V.V. Vesnin,

An algorithm for designing the mechanical milling operation based on the acceptable range of the arithmetic mean deviation of the profile curve and the relative length of the reference profile is describe.
Keywords: face milling, simulation, surface quality, roughness, topography, design operation.

SETTING THE DRIVE AND ENERGY COMPANIES OPTIMIZTSIYA POWER SUPPLY SYSTEMS

I.V. Latochkin, N.I. Smolentsev

The problems of the development method of choice of energy storage options to optimize the enterprise supply system on economic parameters. On the example of a particular company, SEC "Elephant" (Miass) shows the economic effect of energy storage in the power supply system of the enterprise. The work within the framework of the Agreement on the provision of subsidies from 06.05.2014 № 14.577.21.0069 of (RFMEFI57714X0069), customer - Ministry of Education and Science of the Russian Federation.
Keywords: parameters of energy storage, power supply system, local area network (LES), energy storage, high-temperature superconductivity (HTSC), SPENE-1.

QUANTITATIVE STUDY REGULARLY CELLULAR PARAMETERS OF THE MODELS AS A METHOD OF NUMERICAL EVALUATION AND GIS MAPPING AREAS OF

E.P. Krupochkin, D.A. Dirin, A.N. Dunets, E.V. Rygalov

The article considers the problem of developing a regularly-mesh models used in integrated and component assessment areas. The focus of the authors work done on the substantiation of parameters of regularly cellular models to evaluate different types of resources in large-scale studies. Based on conducted calculations and experiments shows the feasibility of the models under consideration during the measurements and a formal assessment of various types of resources to make informed decisions in the field of economic development at the regional level. In the creation method and the use of assessment of tourist and recreational models, the necessity to use a hexagonal operating units with a number of advantages. In particular, it proves the legitimacy of the use of regular networks hexagonal-form side, and the radius of the inscribed circle is 3 km away, which provides the optimum level of automation of computational work and the total costs. The results of the research may be of interest to specialists in the field of Geoinformatics and cartography, as well as geographers and economists, etc., dealing with the problems of formalized assessments of territories at the regional level using geographic information systems and technologies.
Key words: quantifying potential of the territories, regularly cellular models, operational territorial units of the hexagonal network, parameters of the regular operating units.

RESEARCH METHODOLOGY FOR CHARACTERISTICS OF ROCKS WHEN CUTTING-CHIPPING BY PDC CUTTERS

A.N. Gavrilin, B.B. Moyzes, Y.B. Chervach, V.L. Rubtsov, K.I. Borisov, K.V. Melk'ov, A.R. Hajrullin

The aim of the research is to study the dynamics and to increase the reliability of drilling machines. It is described the research trend in the aspect of the composite bits with PDC cutters use. The significance of the research continuation proved. The installation to determine the dynamic hardness of the rock examined. The plan and methodology of the experiment made. The experiment to study the characteristics of the rock made.

Key words: equipment reliability, rock, drilling, bit PDC, strength characteristic, installation for research, destruction processes modeling.

ACCURACY CONTROL OF MEASUREMENT RESULTS

A.E. Kokoreva, I.V. Plotnikova, O.V. Galtseva, M.V. Kitaeva

The reliability and unity of control results provided the scientific basis of metrological support of non-destructive testing, regulatory and technical documentation governing the use of non-destructive testing, non-destructive control with normalized metrological characteristics, certification and standardization of methods of measurement control. Highlights of the development of the measurement methods are described. The importance and significance of the control of metrological characteristics are considered.

Key words: measurement method, measurement system of quantity and indicators of oil quality, control of the metrological characteristics, error, accuracy of measurement results.

DIAMETER CALCULATION IN CONTACTLESS THREE-AXIS MEASURING DEVICES

E.M. Fyodorov, A.A. Koba

The paper presents a three-dimensional method of measuring diameter and ovality of cylindrical objects in diverging laser beam. Mathematical software method is developed. Virtual simulation of this method and experimental testing are made. The results can be used for design and manufacture of optical devices, which will be used for technological control of external diameter of cable, wire, trumpet and other products.

Key words: diameter measurement, diameter calculation, divergent beam, ovality, three-axis method.

THE DEVICE OF DEMAGNETIZATION OF LONG-LENGTH CYLINDRICAL ARTICLES

E.I. Urazbekov, A.E. Goldstein

Representation device of demagnetization of long-length cylindrical articles, based on the usage of the constant magnetic field corrected according to the initial and residual article magnetizations measured during demagnetization is resulted. Showing structural features of demagnetization device.

Key words: magnetization, demagnetization, residual magnetic induction, coercive force, relaxation coercive force.

CONTENTS, ABSTRACTS AND KEYWORDS OF PAPERS

METHOD OF MEASURING THE RELATIVE PERMITTIVITY AND THE POSITION OF THE BOUNDARY A TWO-LAYER LIQUID IN THE TANK

I. V. Plotnikova, A. B. Stepanov, R. I. Yakshigildina

Describes a method of measuring the relative permittivity of each layer of two-layer fluid and determining the position of the boundary between the layers, which is based on the use of three capacitive level sensors. The results of mathematical modeling of the proposed method of measurement.

Key words: capacity of the transmitter, a two-layer fluid, relative permittivity, boundary, measurement error, modelling.

MODELLING OF LIQUIDS PENETRATION IN NON-METALLIC MATERIALS DISCONTINUITIES

I.S. Lobanova, V.A. Meshceryakov, N.P. Kalinichenko, A. N. Kalinichenko, M. S. Kiseleva

Polymer composite materials are widely used in all industries such as rocket science, aircraft and automobile manufacturing, shipbuilding and other. Many of the design elements, constructed from composite materials, are need of constant quality control. Ensuring high quality and reliability of products from non-metallic materials cannot be effective without the use of non-destructive testing methods. One of these methods is a penetrant testing based on the penetration of liquids into the cavity surface defects. The variant of modeling the movement of fluids, which allows determining the speed of the filling defect cavities with various materials and on this basis to select the optimal control, regimes are proposed.

Key words: liquid, nonmetal, metal, modeling, capillary.

QUALITY ANALYSIS OF WELDS OF REINFORCED CONCRETE PRODUCTS BY FMEA

A.M. Belousov, O.A. Belyankova, L.A. Redko, E.V. Shilnikova

The paper describes the results of the quality analysis of 96 welds of concrete products using statistical methods. Identified the most common group of defects of welded joints. Identified the most critical defects from the standpoint of reducing the reliability of a structure. Used the FMEA method for risk level measurement. Marked corrective and preventive actions for improving the welding process.

Key words: quality, defect, welds, reinforced concrete products, FMEA methodology, quality management system, welding, process, risk analysis.

ISOTOPE MASS SPECTROMETRY IN COMBINATION WITH RADIOCARBON DATING FOR STUDIES OF ARCHAEOLOGICAL OBJECTS

E. S. Sverdlov, L. V. Shcherbakova

The article presents the results of a study of the isotopic composition of carbon and nitrogen δ13C δ15N, as well as radiocarbon dates of archaeological samples using liquid scintillation and mass spectrometric methods.

Keywords: isotope ratios of δ15N and δ13C, the radiocarbon method of dating archaeological samples.

DETERMINING OF OPTIMUM SPECTRAL RANGES OF FLAME RADIATION CONTROL AT USE OF COMPENSATORY METHOD OF OPTICAL NOISE REDUCTION

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

Results of research by determining of optimum spectral ranges of flame radiation control at use of a compensatory method of optical noise reduction are resulted. The method of determining of optimum spectral ranges of flame radiation control at burning of methane-air mixes is developed. The criterion of optimality by determining of optimum spectral ranges of flame radiation control is formulated taking into account technical realization of a compensatory method of optical noise reduction. Photodetectors for the control of flame radiation with use of a compensatory method of optical noise reduction are chosen.

Keywords: flame radiation, compensatory method, spectral range, optical noise, photodiode.

THE ISSUE OF HOW CONTROLS ACCURATE REGISTRATION SCANNER STATIONS WHEN PERFORMING THE ENGINEERING AND SURVEYING OF ROADS

B.F. Azarov

Describes an approach to control the accuracy of the spatial position of the appliance when carrying out a large-scale survey to terrestrial laser scanner GLS-1500. Considered various options scan roads and their features. Are the factors that affect the choice of a particular schema bind scanner stations. Provides data on precision casting station scan results to the specified coordinate system using program ScanMaster. Finally, conclusions are drawn about the choice of technology of production work in surveying of linear objects.

Keywords: testing technique of precision terrestrial laser scanning, skaner station, scanner GLS-1500, ScanMaster program, road.

THE DEVICE OF CLEANING THE IRRADIATED BERYLLIUM FROM RADIONUCLIDES

Y.Y. Baklanova, V.M. Kotov, A.V. Gradoboev, A.A. Sitnikov.

The paper addresses purification technology for irradiated beryllium of radioactive impurities with its primary transfer into the chloride. The beryllium chloride is purified from solid cobalt and lithium chloride on the filter at a surface temperature of about 500^0C. Tritium chloride is removed with hydrochloric acid formed by reacting chlorine with hydrogen. The main parameter affecting the quality and safety of the process is the chlorine content at the outlet of the reaction chamber.

Keywords: beryllium, purification, chlorides, radionuclides, filter, device, cobalt, technology.

Development of hygienic lipstick based on extract of licorice and a study of factors shaping consumer commodity and its properties

N.V. Kryukova, G. B. Pishchikov

It is known that, trouble brings to consumers, such manifestations on the lips, as dryness, burning, peeling and cracked. An important role is to protect them from adverse environmental factors play in pre-

vention, by applying special hygienic lipsticks. Natural and biologically active components from plants included in the lipsticks, a positive effect on the hygiene of the mucous membrane of the lips, tone, and protect them from dryness and inflammation. Currently, the number of plants of great value as a basis for creating new highly effective cosmetic products with immunostimulatory, anti-inflammatory and antioxidant properties is licorice root. The studies were designed composition hygienic lipstick based on an extract of licorice, the study of its healing and protective effect in the appearance of cracks and dryness on the lips is established that a positive effect occurs on day 2 while using the lipstick.

Key words: licorice, lipstick, color coordinates, shelf life.

STUDY OF MICROBIOLOGICAL SAFETY OF HYGIENIC LIPSTICK WITH LICORICE EXTRACT

N.V. Kryukova, G. B. Pishchikov, A.S. Gavrilov

The actual solution to the problem of safe hygienic lipstick with licorice extract during storage and shelf life, as well as indirect security problems of the product during consumer use. Studied the effect of preservatives on microbiological purity of lipstick in accordance with regulatory documents (GOST, TS, SanPiN, etc.) on indicators for the "microbiological cleanliness" and "water activity". It is proved that the tested preservative systems have microbiological purity when using and without using samples of lipsticks volunteers. It is established that not all samples of lipsticks exceed the low limit of the indicator "water activity" (less than 0.5). Among the studied preservative systems the lowest level of activity of water has a preservative system: methylparaben (0,1%) - 0,2 and Liquapar Optima (0,5%) – 0,37 which systems provide secure and stable microbiological purity of the product, that fully complies with the microbiological requirements set out in the regulations.

Key words: licorice, lipstick, preservative, water activity, shelf life.

A DESIGN OF DYNAMICS OF THE NON-STATIONARY NEBULIZED STREAM IS IN A LIMIT VOLUME

A.V. Samarin, S.A. Ulrich, S.V. Yakovlev, P.K. Senachin

A simple mathematical model over of dynamics of the non-stationary nebulized stream (NS) injected under constraint in a chemical reactor or swept volume of energy aggregate is brought, that describes NS as material point of variable mass. Model allows based on numeral design to optimize dynamic параметры NS with the characteristic sizes of chamber of reactor.

Keywords: numeral design, dynamics of the non-stationary nebulized stream, chemical reactor, power aggregate.

DETECTION OF ARSENIC AND SELENIUM IN AQUEOUS SOLUTIONS AFTER CONCENTRATING OF EASILY FUSIBLE MELTS

D. G. Antropova, S.V. Temerev

The purpose - to investigate the features of the joint determination of arsenic and selenium in acid chloride solutions. The physicochemical properties of the fusible melts sulfosalicylate hexyldiantipiril methane, promising analogue IL extraction of arsenic and selenium ions with photometric and electrochemical atomic absorption end of the analysis procedure chloride solutions. Efficiency of extracting arsenic and selenium from acidic aqueous solutions fusible organic extract and phase corresponds to the quantitative recovery (D = 519 ± 22; R = 99 ± 1%) acido complexes arsenic and selenium (D = 196 ± 14; R = 99 ± 1%).

The present study is of practical interest for analytical monitoring of trace amounts of arsenic and selenium in the ecosystem components, including the version mikroekstraktsionnogo concentrating on the modified electrode.

Keywords: extraction, arsenic, selenium, exfoliating system, inversion voltammetry.

SELECTION OF SAMPLE PREPARATION CONDITIONS FOR THE DETERMINATION CO (II) OF COPPER TRACE IN CONCENTRATES

T. N. Yakovleva, S. V. Temerev, A. V. Troeglazova

The purpose to select the sample preparation conditions for the determination of trace Co (II) in the copper concentrate.

Acid decomposition of industrial samples by concentrated mineral acids does not allow the improvement of metrological characteristics of the methods; therefore, the improvement of the samples preparation methods appears to be a challenging theoretical and practical task.

Acid decomposition of samples was carried out in mineral acids and their mixtures on exposure to ultrasound and microwave radiation, and to heating.

Intensification of the processes of copper concentrates decomposition by nitric acid (1:1), by ultrasound and microwave radiation took 20 minutes to quantitatively transfer cobalt into mineralizate. The amount of acids used decreased, and the reproducibility of the detection increased due to parameters unification.

Keywords: copper concentrates; sample preparation; decomposition; cobalt; acid dissolving; ultrasound and microwave decomposition.

THE POSSIBILITY OF WOLFRAM CONCENTRATE DECOMPOSITION WITH AMMONIUM BIFLUORIDE

Dyachenko, R.I. Kraidenko, S.N. Chegrintsev, A.D. Kiselev

The purpose of present research is the conditions definition of wolfram concentrate decomposition with fluorinating agent - ammonium difluoride with the greatest decomposition degree of raw material. Temperature, time, the excess of fluorinating agent and the type of fluorinating agent were the variable parameters during the research. The rationale of research is the interest in developing the new technology of wolfram concentrates recycling with a fewer waste, the possibility of opening agent regeneration and, as the result, the reduction of final production cost. Elemental and phase composition of wolfram concentrate from JSC «Zakamensk» are given below. Reactions of concentrate components interaction with are given below and stoichiometric ally required amount of fluorinating agent is calculated.

Key words: wolfram, wolfram concentrate, ammonium difluoride, fluoridation, JSC «Zakamensk».

EXPERIMENTAL STUDY OF NONISOTHERMAL ABSORPTION WITH A VARIABLE DEPTH OF THE ABSORBENT LAYER

N. S. Bufetov, R. A. Dekhtyar, V. E. Nakoryakov

Experimental studies of thermo-capillary convection in a solution of lithium bromide with non-isothermal absorption of water vapor in a restricted vessel with a variable depth of absorbent are presented. With the development of convection thermo-concentration thermogram the interface for a various

working parameters are obtained. At development of the thermoconcentration convection, the thermograms of the boundary surface for various regime parameters both with surfactant, and without it are received. It is shown that introduction to surfactant solution of small concentration (25-50 ppm) leads to the intensification heat- and mass transfer in system solution bromide of lithium-surfactant-steam, to the rupture of a thin film of absorbent and the formation of "dry spot".

Key words: *absorption, lithium bromide, surfactant, heat and mass transfer, thermocapillary convection.*

THE DEFINITION OF THE FORMS OF MERCURY IN BIOLOGICAL OBJECTS

M.A. Babenko, S.V. Temerev

The work purpose - to determine by method of atomic absorption of a form of mercury in biological objects in particular, fish and seafood.

The analysis by method of cold steam on the general content of mercury in 12 acid mineralizata of biological samples is made. Extraction of inorganic forms of mercury from biota samples by means of an organic phase of the stratified system water-antipirin-sulfosalicylic acid is used for assessment of quantity of organic forms of mercury.

This method can, is recommended for chemical monitoring of biological objects.

Keywords: mercury, a method of "cold steam", stratified system water-antipirin-sulfosalicylic acid.

SPECTROSCOPIC STUDY OF FERROELECTRICITY CROCONIC ACID NATURE

Y. A. Fadeev, E. V. Saltanova

The influence of weak electric fields on the intermolecular interaction in croconic acid by repeatedly frustrated total internal reflection is studied. Displacement and redistribution of the intensities of the absorption bonds of molecular fragments involved in hydrogen bonds is observed in the IR spectrum. In weak electric fields, changes of croconic acid molecules polarization take place and the group of molecular fragments involved in hydrogen bonding from a resonant system with a possible proton transfer.

Keywords: croconic acid, hydrogen bonding, proton transfer, infrared spectroscopy, frustrated internal reflectance.

USE OF THE ELECTROEXPLOSIVE TECHNOLOGY FOR ENRICHMENT OF MINERAL RAW MATERIALS

O.V. Galtseva, S.V. Bordunov, A.I. Nikitina

A wide range of processes of mineral raw materials processing can be combined with the use of the electroexplosive technology, but the industrial process equipment is still not created. This is due to the issues of safety at working with high voltage and the equipment designing with a low material consumption. In this case, the process of impact by shockwaves to raw materials and walls of the apparatus was organized; these amplitudes are comparable with shockwave amplitudes at the explosion of explosives, erosion of the electrodes and the low strength of the materials for the insulation of high-voltage electrodes. The present work is devoted to the problem solution of development of the industrial electroexplosive equipment and testing of the designed experienced skilled – industrial samples of the installation.

Key words: electroexplosive technology, mineral raw materials, laboratory bench, reactor, enrichment.

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METHODS FOR THE DETERMINATION OF AMMONIA IN THE AIR OF WORKING ZONE

L. B. Pyatnichko, L. S. Egorova, B. P. Shipunov

A review of methods for determining the presence of ammonia in the workplace and other enterprises refrigeration industry currently used. Shows a brief description of them, marked by shortcomings and propose a new diagnostic method for increasing the concentration of ammonia.

Keywords: the methods for determining, air, concentration, ammonia, indicator.

POWER CALCULATION OF PNEUMATIC MIXING IN FERMENTER

G. E. Kokieva, Yu. A. Shaposhnikov, A. A. Larionova

This article describes the calculation of power consumption for mixing of the nutrient environment in the apparatus. Considered pneumatic mixing associated with a design feature of the apparatus, the formulas for calculating the power for mixing.

Keywords: pneumatic mixing power of the fermenter, power stirring, power.

ASSESSMENT OF DURABILITY OF GALVANIZED MULTI-BLADE SCREW "BAU"

I.V. Noskov

In article is given calculation of durability screw multi-blade galvanized "BAU", in consideration with corrosion processes and degree of aggression of the environment, based on the actual Russian regulating documents and Eurocode EN 1993-Part 5-2007.

Keywords: a screw multi-blade pile, zinc protective coating, hostile environment, corrosion, operation period.

THE STUDY OF TEMPERATURE INFLUENCE PLASMA SPARK SINTERING ON THE MICROSTRUCTURE OF THE ALLOY BASED ON TI-AL-NB

B. K. Karakozov, A. A. Sitnikov, W. R. Kurbanbekov, M. K. Skakov, V. Baklanov, V. I. Yakovlev

The work presents results of microstructural analysis of the samples based on the system Ti-Al-Nb, acroplastica obtained by sintering at temperatures of 1100, 1200, 1300, and 1550 ºC. Determined the relative density of the samples. It is revealed that the surface microstructure of the samples sintered at temperatures of 1100, 1200 ° C, non-uniform and consists of small and large grains of phases α2, Nb2Al and particulate discharge Ti2AlNb phases with irregular plates-bar structure, and also of unreacted particles of niobium and titanium. With increasing temperature (1300, 1550 ° C) samples have a homogeneous lamellar structure. With the help of energy, dispersive x-ray analysis was carried out mapping and set the distribution of elements on the sample surface.

Key words: intermetallide compound, titanium aluminide, plasma spark sintering, microstructure, mapping, phase composition.

CONTENTS, ABSTRACTS AND KEYWORDS OF PAPERS

SMALL-SCALE EXPERIMENTS SIMULATING WATER-MODERATED REACTOR SEVERE ACCIDENTS WITH CORE MELTING

B. K. Karakozov, A. A. Sitnikov, W. R. Kurbanbekov, M. K. Skakov, V. Baklanov, V. I. Yakovlev

The paper presents a brief description of the experimental stand and the main results of experiments in which water-moderated reactor of "Fukushima-1" NPP severe accident simulated. As a result of experiments and post experiment research the temperature of crystallization of composition of materials, similar to the "Fukushima-1" NPP reactor core content, was determined, phase composition of solidified fragments of core melt simulator was defined, interaction between the melt of structural steel SUS 304 and the core melt simulator was described.

Keywords: severe accident, nuclear power plant, Fukushima, VVER, CORE, Corium, Steel, experiment, Interaction, Diffusion.

PREDICTION OF CHANGES OF STRUCTURE AND PROPERTIES OF STRUCTURAL MATERIALS OF BN-350 REACTOR DURING LONG-TERM DRY STORAGE OF SPENT NUCLEAR FUEL

E.T. Koyanbaev, A.A. Sitnikov, M.K. Skakov, V.V. Baklanov, V. I. Yakovlev

In this work illuminated the most used methods for storing spent nuclear fuel from power reactors. Reflected the main problems of safety assessment of long dry storage of spent nuclear fuel in particular, the fuel assembly's BN-350. Material designated tasks relevant to the selected storage conditions. Shows some, getting to this point, the results of studies of natural materials, spent fuel assemblies of bn-350, as after reactor irradiation and post-tests, simulating the conditions of long dry storage. In conclusion, you performed the formulation of the currently relevant task for research.

Keywords: BN-350, fuel Assembly, fuel rod, austenitic became dry storage, reactor irradiation, corrosion, radiation damage, embrittlement.

MICROSTRUCTURE CHANGES OF TUNGSTEN UNDER THE REACTOR IRRADIATION IN HYDROGEN

A. G. Miniyazova, A. A. Sitnikov, M. K. Skakov, I. L. Tazhibayeva, V. I. Yakovlev

Research includes the studying of the behavior of tungsten (plasma-facing material in fusion reactors) under neutron irradiation in a hydrogen atmosphere. Long-term neutron irradiation of tungsten samples (99.99%) was carried out in a research nuclear reactor WWR-K and studied the effect of exposure to changes in the microstructure of tungsten. There is shown an effect of the synergistic effects of neutron irradiation and hydrogen on the microstructure of tungsten in the long process of reactor irradiation for 3255 hours. Carrying out simulation experiments on the effect of reactor irradiation on the characteristics of the interaction of hydrogen isotopes with structural materials of fusion reactor will help establish a correlation and synergies between exposure to fission and fusion reactors materials.

Key words: ITER, fusion, plasma-facing tungsten, neutron irradiation, hydrogen, SEM, microstructure, structural defects.