ABSTRACTS

Section of «Metallurgy. Welding»

UDC 669.162.463.2 Sigarev E., Nedbaylo N., Krivtsun I. IMPROVEMENT DIRECTION DESULFURIZATION CAST IRON LADLE. The results development technology at booths desulphurization installation in 230-ton ladles converter shop of JSC «DMP». The features organization refining molten sulfur injection mixture reagents based on fluid lime and granulated magnesium. Directions improving injection modes reagents decrease melt temperatures and loss metal from slag, downloadable after treatment.

Keywords: desulfurization, lime, magnesium, iron, slag, lance.

UDC 622.78 Rudenko M., Zyuz' V., Rudenko R. OPPORTUNITIES TO IMPROVE THE QUALITY OF BATCHING OF CHARGE MATERIALS OF THE WORKSHOPS OF THE AGGLOMERATION. The developed technique of calculations of the sinter charge, the material and heat balance, which includes a significant amount of charge materials from different material compositions. The developed method allows to provide control over quality indicators of burden at different stages of preparation.

Keywords: mixture, pelletizing, particle size distribution, dispensing, balance.

UDC 669.184.125 Sigavev E., Bayduzh U., Semenova D. SLAG BOF MELT MODE WITH INTEGRATED FLUX. The results study of laws slag formation during the initial period when converting bath blowing additives dispersed in time integrated magnesia flux. Defined technological advantages and disadvantages of integrated flux. Directions increase efficiency of integrated flux while maintaining performance desulfurization, dephosphorization melt and increase output of the liquid metal.

Keywords: converter, slag, skull, flux, blowing, dephosphorization.

UDC 621.746.62:669.189 Hress O., Chebotaryova O., Isayev O., Wu K.M., Yeremenko A. QUANTITATIVE RESEARCH OF BAND'S FEEDING IN THE ROUND MOULD. Mathematical and quantitative e models for calculating heat and masstransfer of metal in the continuous casting round mould with submerged entry nozzle through the exhaust port are developed. The thermal and hydrodynamic regularities of melt's behavior has been simulated, including the mould inoculant in the form of a metal strip with a different chemical composition from the base with possible oscillation, has been simulated.

Keywords: continuous casting, round mould, molten metal, mathematical modeling.

UDC 669.296 Tolok A., Romanjuk R. ASSAYING THE INDUSTRIAL METHODS RESTORATION OF JOINTS ZIRCONIUM TO METAL OF KERNEL PURITY. In papers it is presented a process of reception zirconium of kernel purity on an instance of the existing circuit design which is applied on one the factories of Ukraine. It consists of following stages: concentrate rolling-on, upgrading, branch of impurities, zirconium and hafnium separation, restoration and fusion. Existing industrial methods of restoration joints of zirconium to metal are analyses. Most widespread of them are a magnesium thermal, calcium thermal and electrolytic. Each of methods has the advantages and deficiencies. Calcium thermal is most simple direct method manufacture of zirconium and its alloys, he allows to gain zirconium alloys immediately in the course of restoration and at use of induction furnaces with cold crucibles for its further fusion can consider the given expedient one of the most perspective.

Keywords: process, zirconium, concentrate, method, restoration, fusion, bullion.

UDC 621.791.927.5 Babinets A., Ryabtsev I., Panfilov A., Peremitko V. THE EFFECT OF THE SURFACING MODE ON THE FORMATION AND DIMENSIONS OF BEADS, WELDED SELF-SHIELDED FLUX CORED WIRE ON FLAT AND CYLINDRICAL PARTS. The dependence of the effect of current and voltage of surfacing on the formation and geometrical parameters of the weld beads for open arc surfacing on flat and cylindrical parts are defined. It is established that in both cases there are almost identical dependence on influence of surfacing modes on the width and the proportion of the base metal in the deposited. The influence of the offset from the zenith axis of the electrode for surfacing on cylindrical parts to a penetration depth is established. This allows the use of flat samples at the selection of optimum modes for surfacing cylindrical parts.

Keywords: arc surfacing, surfacing mode, penetration, self shielded flux cored wire.

Section of «Rolling production»

UDC 621.771.01 Maksimenko O., Kachan O. THE INFLUENCE THE RESULTING OF THE LONGITUDINAL FORCES ON THE CORNER NEUTRAL SECTION. The article shows that the balance of the metal rolls can be broken in the presence of lead in the deformation zone. On the basis of the balance of longitudinal forces we proposed a new measure of the boundary conditions of rolling. That criterion is the average integral value of the resulting internal longitudinal forces. The correspondence between the theoretical calculations of the boundary conditions of rolling and experimental results.

Keywords: angle neutral section, the internal longitudinal forces, longitudinal stability, deformation zone.

UDC 621.771.23 Romanjuk R. ENERGETICALLY SAVING UP DRAUHGTING SHEDULE FOR ONE CAGE OF THE REVERSING MILL OF COLD ROLLING 1500 STALEMATE „MODULE”. Existing regimes deformations of strips on one cage the cold mill 1500 are analyzed. For the purpose of their development it is offered to increase fasthead and back tension at rolling in each pass. The estimation of stability in pitch a process of deformation is spent on the basis of a relationship retracting and expulsive forces which act in each cross-section a zone of contact a strip with rolls, by means of stability parameters. Energetically saving up regimes of deformation for manufactures of strips by thickness 0,4, 0,5 and 0,8 mm are resulted is counted decrease in expenses of the total moment and a rolling power.

Keywords: reversing mill, cold rolling, stability, moment, power, epure.

Section of «Engineering. Mechanics»

UDC 669.013.002.5 Beygul O., Lepetova A., Beygul V. THE RESEARCH AND BASIS OF LOAD-CARRYING SYSTEM PARAMETERS FOR PORTAL TRUCK. The mathematical model of portal truck disturbance motion by kinematics disturbance of uneven technological roads has been worked out. The forming of design loading has been investigated, the parameters of basic force elements for load-carrying system of technological portal truck has been calculated.

Keywords: mathematical model, disturbance motion, portal truck, parameter, load-carrying system.

UDC 669.013.002.5:531.3 Beygul O., Mamayev L., Beygul V. THE INFLUENCE OF CROSS STABILITY STABILIZER ON CRITICAL SPEED OF PORTAL CONTAINER TRUCK BY ASYMMETRICAL KINEMATIC DISTURBANCE. The mathematical model of articulated portal container truck disturbance motion by asymmetrical kinematic disturbances because of uneven technological roads has been worked out. The critical speed of con-

tainer truck as speed in neighboarhood of cross stability loss has been identificated. The influence of cross stability stabilizer on critical speed of asymmetrical disturbance motion of portal container truck has been discovered.

Keywords: mathematical model, disturbance motion, portal container truck, elastic suspension, kinematic disturbance, critical speed.

UDC 631.315.2:62;52;01.04 Mamaev L., Beygul O. THE OPTIMIZATION OF CABLES DESIGN BY VIEW OF FRICTION. The theoretical and experimental investigation of friction forces influence for optimization of performance of control cables has been conducted. The recommendation for optimization of cable construction for working conditions has been received.

Keywords: cable, outer layer, wire, friction, bending.

UDC 621.867.427 Chasov D. DESCRIPTION OF EXPERIMENTAL RESEARCH OF INFLUENCE OF ADDITIONAL SHOVEL ON PERFORMANCE SCREW CONVEYORS. Designed, manufactured and tested in laboratory and industrial conditions prototype screw conveyor with different angles of attack more blades, which describes the process and methodology of experimental studies of the effect of structural elements on the productivity of screw conveyor, which can be used in the design of similar pipelines for specific shop conditions.

Keywords: additional blade, auger, experimental stand.

UDC 664.61 Yatsuk A., Halahuza V. THE CONDITIONS OF FLOW, WHEN SPEED OF DOUGH IS BIGGER THEN SPEED OF LIQUID IN OILY LAYER. The problem of movement for dough mass in canal with hydro dynamical lubrication has been solved. The mathematical model of dynamical condition for viscous liquid has been worked out. The equation of simultaneous flow has been received.

Keywords: problem of movement, mathematical model, dynamical condition, viscous liquid, simultaneous flow.

UDC 621.1.018 Chuhno S. CALCULATION OF EXPENSE OF LIQUID AT COOLING DETAILS by AIRILY-LIQUID MIXTURE. The terms of the effective cooling of airily-liquid mixture of surface of detail a stream are considered in the article, temperature of Leydenfrosta heated below, at the different concentrations of mixture, speeds and sizes of drops of liquid.

Keywords: cooling, airily-liquid mixture, temperature of Leydenfrost, concentration.

Section of «Radioelectronics»

UDC 621.391 Ryazancev O., Kulik M. THE INTERPRETATIONS OF THE COEFFICIENT OF DIRECTIONAL ANTENNAS ACTIONS. Geometrical interpretations of coefficient of orientation of action (COA) of aerial are got for rationed and unrationed DO, and also expressions for the simplified calculation of COA.

Keywords: coefficient of orientation of action of aerials, peak diagram of orientation, spherical system of co-ordinates, standard source.

UDC 621.372.543.2 Klyutsa V., Marchenko S., Syanov A. CALCULATION AND OPTIMIZATION MICROSTRIP FILTER BAND 2.4 GHz. The calculation of the half-wave open-loop resonators microstrip filter was carried out in this paper. The filter was optimized with electromagnetic computer program HFSS 13, that resulted to changing of strips-

resonators geometrical dimensions and improving of filter's electromagnetic parameters. The process of optimization allows to get electromagnetic parameters that meets technical requirements of wireless communication standard IEEE 802.1.

Keywords: microstrip filter, electromagnetic parameters, wireless communication standard, geometrical dimensions strips-resonators.

UDC 621.771.04 Meschaninov S., Nelga A., Ityakin O., Voloshin R., Gupalo U. DEVELOPMENT OF AUTOMATED CONTROL SYSTEM CORRECTION COMPRESSION PRECISE ROLLING BANDS AT UNSTABLE FUNCTIONAL STATE OF OPERATOR. Developed an automated system to correction the value of compression reversing rolling mill exact function of thick bands in the main disturbances – changing temperature and thickness tackle the penultimate passes on algorithms that determined the level of functional working condition operator-roller. Dependence experimentally proved quality accurate rolling thick bands of emotional state operator-roller. The proposed method changing control of the functional working condition using the method vibroimage face the operator.

Keywords: functional state operator, reversing mill, accurate rolling bands, vibroimage, automated system.

Section of «Electromechanics. Electrical engineering»

UDC 62-83 Derets A., Sadovoy O. OPERATION ANALYSIS OF FOURTH-ORDER SLIDING MODE CONTROL SYSTEM, OPTIMIZED IN TIME DOMAIN WITH N-i SWITCHING METHOD FOR "BIG TRIANGLE" OPERATING MODE. Steadiness of sliding mode was proved in analytical way for fourth-order control system, tuned in "big triangle" operating mode with "N-i switching" method. Obtained expressions for control action range bounds, provides realization of prescribed form of trajectory, optimal in time domain. The transient simulation results were presented. Researches carried out conformably to electric drive with elastic transmission.

Keywords: sliding mode control system, optimality in the time domain, "N-i switching" method.

UDC 681.5.03 Volyanskiy R., Sadovoy O. FORMATION OF INTEGRAL COMPONENT OUTPUT SIGNAL PI CONTROLLER WITH SATURATION. Based on the review of the literature performed proved the feasibility of the research to date. We synthesized PI controller for the system in an open phase space. It is shown PI control algorithms with limitation, switching off and reducing integral part of algorithm while the control object is accelerated. It is shown that the best quality of transients in a control system is provided with disabling the integral gain when the regulator in saturation and its subsequent amplification when leaving saturation. To determine the gain of the integral term is proposed to use the root methods.

Keywords: linear control system, PI-controller, saturation, variable gain.

UDC 62-83:681.513.5 Kluyev O., Sadovoy O. ASYNCHRONOUS GATE CASCADE PARAMETRIC CURRENT SOURCE IN THE ROTOR CIRCUIT. The article research the dynamic modes asynchronous gate cascade (AGC) with parametric source current in the rotor circuit. The method of mathematical modeling proved that impulse formation electromotive force (EMF) current source allows to control the speed of AGC to equal acceleration and deceleration of the drive relevant regulator, subordinates control speed, or available system only with control speed, where the constant current power source is

carried out. Possible to enhance the power factor of AGC by setting the thyristor inverter control angle for the highest possible switching conditions.

Keywords: asynchronous gate cascade parametric current source, optimal control, switching, power factor.

UDC 621.313.33 Kolychev S., Kachura A. STUDY START-UP INDUCTION MOTOR WITH INDUCTIVE-CAPACITIVE ENERGY STORAGE IN THE ROTOR CIRCUIT. The induction motor with wound rotor, which rings are connected with inductive resistors (IRs) in order to improve the starting performance proposed to include an active-capacitive RC-elements parallel for IRs. The results of numerical and physical experiment confirm the efficiency of the device based on the IR-RC components in the asynchronous starting of the induction motor.

Keywords: motor with a wound rotor, induction-capacitive device.

UDC 621.314 Bombyk B. ANALYTICAL MODEL MPPT-FUNCTION CONTROL SYSTEMS VOLTAGE INVERTER SOLAR POWER. Has been done approximation of statistical data using the functions described quadratic, cubic and polynomial regression. Has been construct graphs of power from the output voltage using these features and made their comparison. Has been determined correlation index and tested the adequacy of each model by Fisher criterion.

Keywords: approximation, regression, Fisher criterion.

Section of «Chemical technology. Biotechnology»

UDC 661.632 Laricheva L.P., Voloshin M.D., Dubik O.S. THE RESEARCH OF THE EFFECT OF GRINDING DEGREE ON PROCESS OF ACID DECOMPOSITION OF PROSPHORITES. The research of the effect of raw material grinding degree on a decomposition process of aluminium and iron containing prosphorites with the use of phosphoric and sulphatic acids has been conducted. It has been shown that in the interval of 40-80^{0}C the decomposition degree of the phosphate part of phosphorites is rising up with the rise of grinding degree. The decomposition degree of the of admixtures which contain sesquialteral oxides of iron and aluminium depends on the chemical and mineralogical composition of raw materials.

Keywords: acidic processing of phosphates, sesquialteral oxides of iron, sesquialteral oxides of aluminium, decomposition degree, grinding degree.

UDC 628.16 Ivanchenko A., Voloshin M. RESEARCH AND DEVELOPMENT RESOURCESAVING TECHNOLOGY PRODUCTION BIOMINERAL FERTILIZER FROM WASTE TREATMENT FACILITIES WITH THE ADDITION OF FALLEN LEAVES. The urgency of the solution creating new types biomineral fertilizer, waste disposal and intensification of the anaerobic digestion process. Found that the preliminary dispersion the input of raw materials increases the speed of process anaerobic digestion in 1.6 times. The dependences of the volume biogas from the duration the anaerobic digestion process. It is shown that maximum amount biogas 0,57 m^3/kg can be obtained using as starting materials compacted active sludge, fallen leaves and sediment after phosphate removal sludge production of calcium nitrate. Chemical analysis of the fertilizer is made. It is shown that the fertilizer based on waste treatment facilities with the addition of fallen leaves has the following composition, %: C – 52,0; $N_{tot.}$ – 3,80; P_2O_5 – 5,77; K_2O – 25,30; CaO – 9,8. The technological scheme of resourcesaving technology of production biomineral fertilizers from the waste, which the use of deposition phosphates, compaction of activated sludge production of

calcium nitrate and dispersion of the feedstock to increase the speed of the anaerobic digestion process.

Keywords: biomineral fertilizer, waste, biogas, anaerobic digestion.

UDC 349:0,61.22.0521(100.2) Voloshin N, Kharitonova O. PHYSICO-CHEMICAL BASIS OF THE PROCESS ROF SEPARATION OF RARE EAFTH ELEMENTS. The paper presents the results of laboratory study into the processes for separation and enrichment of rare earth element (REE) concentrates in a natural ratio of lanthanum and cerium line light group. The separation process is based on difference in solubility of 3- and 4-valence cerium components in nitric acid. Oxidative drying of REE concentrates allows for a sufficiently complete cerium conversion to a 4-valence state. Lanthanum, neodymium and praseodymium oxides are readily soluble in weak nitric acid with a 4 to 5 PH value, while cerium remains as CeO_2 oxide in a solid phase. Lanthanum content of liquid phase in the first REE concentrate has grown from 25% to 50%, while that of cerium has gone down from 55% to 25%. Cerium concentration in the second REE concentrate has grown from 55% to 85%. The production of lanthanum and cerium enriched concentrate has added to their more efficient application as catalysts in metallurgy.

Keywords: rare earth elements, cerium, lanthanum, neodymium, praseodymium, concentrate, enrichment, separation.

UDC 547.757.547.466.757.158.344:31/611.81 Gulyaev V., Kornienko I., Chetverykova K., Trishyna V., Golovey O. ADAPTATION PHYSICAL AND CHEMICAL SIMPLIFIED METHOD FOR DETERMINING AMINO ACID TRYPTOPHAN TO THE EDUCATIONAL PROCESS. Was designed more optimal and more affordable method of determining the amino acid tryptophan, which can be recommended for implementation during the laboratory work in teaching and educational institutions. Found that the content of tryptophan in casein is 1.4%.

Keywords: casein, pancreatin, tryptophan, L-dimethylaminobenzaldehyde, vanilla.

UDC 604.4:664 Anatsky A., Filimonenko O., Matvijuk T. STUDY OF THE PROCESS OF PREPARATION OF FUNCTIONAL KVASS DRINK WITH THE ADDITION OF FERMENTED MILK SERUM. Proposed use of the fermented milk serum in composition of kvass. It is established that her introduction to kvass' mash at a ratio of 1:2 does not impair the organoleptic indexes of drink, does not cause change in the acidity above the standard value, leads to an increase of solid substances in kvass and can be considered as an additional source of vitamins, macro-and microelements, organic acids.

Keywords: foods, kvass, lacto bacteria, fermentation, organic acid, vitamins.

UDC 664.665 Kornienko I., Gulyaev V., Golovey O., Krishtal T. STUDY OF BIOLOGICAL ACTIVITY OF MICROBIAL STARTER CULTURES IN BAKING UNLEAVENED BREAD WITH HIGH DRY PROPERTIES. Developed an optimal formulation beskidiana of bread using lactic acid bacteria to improve the nutritional properties of baked products with lower caloric content. Investigated the microflora of starter cultures of different types to determine the most appropriate and useful; microbiological safety of flour of different types; the total number of microorganisms in 1 g of product was also identified quantitative dynamics and species diversity of starter cultures and microbiological safety of flour.

Keywords: biological activity, ferment, bread, flour, dynamics.

UDC 543.94+543.635.62+547.896.1/.8+547.96 Gulyaev V., Kornienko I., Trishyna V., Chetverykova K., Golovey H. RESEARCH TECHNOLOGY BIOLOGICAL WASTEWATER TREATMENT IN BIOPONDS. The influence of anthropogenic pollutants of the state of wastewater. The efficiency of the use of higher aquatic vegetation for sewage treatment

from heavy metals, nitrogen and phosphorus. Proved in principle the use bioponds for purification of wastewater.

Keywords: Eutrofication, wastewater, bioponds, Pseudomonas, demineralization, treatment.

UDC 681.3.65.014.1 Gulyaev V., Kornienko I., Golovej E, Fursevich I. MICROBIOLOGICAL STUDY OF THE SOIL FOR THE DETECTION OF PATO-GENETIC CULTURE *CL. PERFRINGENS* (FOR EXAMPLE CITI KAMENSKY). The purpose of this paper is to determine the degree of suitability of soils for agriculture. Reasonably point study of soils c. Kamensky. Performed microbiological research in certain points. The investigation of soils for detection of pathogenic cultures *Cl. perfringens*. Substantiated the degree of toxicity of certain points.

Keywords: pathogenic culture, bìocenoz, toxicity, elektive environment, clostridia.

UDC 579.846.1 Gulyaev V., Kornienko I., Anatsky A., Filimonenko O., Gerasimov S. RESEARCH CONTENT NITRIFYING BACTERIA AS AN INDICATOR OF PURITY SOIL. The content of nitrifying bacteria in the soil of the Dneprodzerzhinsk. Soil sampling at different points in the city, the sowing of ground diluted suspensions, qualitative reaction to presence of nitrifying bacteria was conducted. Levels of pollution in different areas of the Dneprodzerzhinsk was determined.

Keywords: pollution, soil, microorganisms, chemolithoautotroph, *Nitrobacter*, nitrogen, diphenylamine.

UDC 631.423.3 Gulyaev V., Kornienko I., Gerasimov S., Fursevich I. DEFINITIONS NITROGEN AND PHOSPHORUS IN SOILS OF THE KAMENSKOE. Nitrogen and phosphorus in soils of the Kamenskoe was research. Soil sampling at different points in the city, quantitative analysis of nitrate, ammonium and phosphorus was conducted. Recommendations for improving soil quality was provided.

Keywords: nitrates, ammonium, phosphorus, pollution, soil.

Section of «Ecology. Life Safety»

UDC 504.05 Lytvyn A., Puzyr D. SIMULATION OF SANITARY PROTECTION ZONE OF CEMENT PRODUCTION, TAKING INTO ACCOUNT CLIMATE-GEOGRAPHICAL CONDITIONS. Computer simulation of dispersion of emissions of the cement plant. Simulation results show that in reality the sanitary-protective zone (SPZ) enterprise forms emissions does not coincide with the SPZ defined with respect to hazard class.

Map contamination should always be adjusted taking into account the climatic conditions and terrain, as the reality of the impact of emissions may be underestimated in the environmental and socio - economic sense.

Keywords: modeling, ecology, emissions, sanitary protection zone.

UDC 635.655:61 Matyasheva O., Bielokon K., Kozhemyakin G. RELEVANCE AKTUALITY OF SOYBEAN PRODUCTION IN UKRAINE CONCERNING ABOUT CITIZENS HEALTH AND ENVIRONMENTAL ECOLOGIKAL SAFETY. The country ecological and food safety problems are described in this work. The world and national soy beans markets condition was analyzed, its perspective as a food product in solving the tasks of vegetable and animal albumen deficit to provide the continuous production of ecologically clean food was defined.

Keywords: bioresources, soybean seeds, albumen materials, human health, saving resource.

UDC 629.039.58 Makhovsky V., KriukovskaO. RISK ASSESSMENT AND DEVELOPMENT OF ACCIDENT AND EMERGENCY AT CHLORINATION FILTRATION PLANT. In the article the authors present the results of research and a quantitative assessment of the risks that may arise in case of accidents and emergencies on the chlorinator pump station taking into account the characteristics of the processes, their duration, the degree of influence of dangerous chemicals, the infection zone size, the human factor. Recommendations to reduce the likelihood of accidents and emergencies on the chlorinator filter pump station.

Keywords: accident, emergency, risk, danger.

Section of «Education»

UDC 372.851 Derets E. METHODOLOGY OF FORMING PRACTICAL SKILLS IN HIGHER MATHEMATICS ON THE EXAMPLE OF TRAINING TOPICS „INDEFINITE INTEGRAL. THE METHODS OF INTEGRATION". We study the process of formation of practical skills in the study of the key sections of the integral calculus of functions of one variable. The questions of perfection of a technique of studying the indefinite integral, examples of systematization of material and tasks for diagnostic testing are considered.

Keywords: methods of teaching, higher mathematics, indefinite integral, integration methods.

UDC 378.147 Derets E. METHODS TO IMPROVE EFFICIENCY INDEPENDENT WORK OF STUDENTS OF THE HIGHER TECHNICAL SCHOOL IN THE STUDY OF HIGHER MATHEMATICS COURSE. The analysis of methodology of conduct of independent work of students of non-mathematical specialties of higher technical school in teaching higher mathematics is considered. In particular, there are experienced the entering into tasks for independent work professionally oriented tasks and variable component, which is determined individually for each student, depending on the results of his work.

Keywords: higher mathematics, independent work of students, teaching methodology.