

Summaries

UDC 514.76

E.T. Ivlev, E.D. Glazyrina
**ABOUT TWO-DIMENSIONAL MANIFOLD OF
CENTERED 2-PLANES IN MULTI-DIMENSIONAL EUCLID
SPACE E_n ($n > 4$)**

The field of two-dimensional planes L_2^2 is built by analytic and geometric way. The planes are associated with two-dimensional manifold of centered 2-planes L_2^1 in E_n , when each L_2^1 -plane corresponds to L_2^2 -plane laying in the corresponding normal $(n-2)$ L_2^1 -plane. The paper is focused on mapping the L_2^1 -plane onto L_2^2 , which are defined by quadratic functions of two variables with domain of definition L_2^1 and range of values L_2^2 . Known Cauchy-Riemann conditions are taken to study the mapping. All considerations are local and all the used functions are assumed to be analytic.

UDC 530.12:531.51

V.V. Lasukov
RADIATION OF GRAVITATIONAL ATOM

Gravitational analogue of non-stationary perturbation theory is developed. Basing on this approach the author studies the process of generation of massive quantum of scalar field by a gravitational atom.

UDC 542.943.7:541.183.5:532.78:519.24

N.V. Lepekhina, V.D. Ababiy
**INVESTIGATION OF CERTAIN ELEMENTARY
PHYSICAL-CHEMICAL PROCESSES ON SURFACE BY
MONTE-CARLO METHOD**

Mechanisms of simple physical-chemical processes on the surface (adsorption, desorption and recombination of atoms) is studied by Monte-Carlo method. Probability equations are built to prove statistical calculations theoretically. These equations allow to compare stochastic and kinetic models and to define the constants of the rates of elementary stages using parameters of the Monte-Carlo model. The solutions of the probability equations gives the values defining the rate of growth of adsorbate concentration and stationary value of the concentration.

UDC 531:534.536.425

V.N. Belomestnykh, E.P. Tesleva
**POLYMORPHIC TRANSFORMATIONS OF «ORIENTATIONAL
ORDER – DISORDER». PART I. GENERAL CONCEPT**

The polymorphism phenomenon is terminologically defined concerning the complex ion-molecular crystals. The paper shortly presents theoretical approaches to describe the crystals and experimental methods of studies.

UDC 539.3

V.N. Barashkov
**ALGORITHM TO REALIZE THE PROBLEMS OF A THEORY OF
ELASTO-PLASTICITY BY VARIATIONAL-DIFFERENCE
METHOD. PART II**

The numerical procedure of definition two- and three-dimensional elasto-plastic stress-strained state of a solid deformable body with the help of a variational-difference method implementing a variation principle of the Lagrange by a method of finite differences is presented. The physical parities are received according to the theory of small elastic-plastic strains, and the geometric parities are taken by the Cauchy equations. The physical nonlinear problem is solved by the

method of variable parameters of elasticity. The sample problem about deformation of a solid of revolution of the ogival shape and cylindrical quadrant compares the direct and iterative methods of solving the system of linear algebraic high order equations, generated by usage of indispensable condition of an extremum of grid analog of a functional of total potential energy of the system.

UDC 552.322+553.411.071

I.V. Kucherenko
**SMALL INTRUSIONS OF BERICUL ORE FIELD
(KUZNETSK ALATAU)**

The paper emphasizes petrologic and metallogenic value of studying the small intrusions in meso-thermal gold deposits. Association of dykes of acid igneous rocks were proved to be generated in Bericul ore field at post-plutonic before-ore stage. The association was followed by many-act formation of association of before-, intra- and post-ore dolerites.

UDC 553.311

V.G. Voroshilov, Yu.S. Ananyev
**ORE-METASOMATIC AND GEOCHEMICAL ZONALITY OF
KARATAV ORE OCCURRENCE OF GOLD (EASTEN SAYAN)**

The paper presents the studies of hydro-thermal-metasomatic formations and initial geo-chemical aureoles of Karatav ore occurrence of gold (Easten Sayan). The detected ore-metasomatic and geochemical zonalities allowed to geometrize ore-bearing beresite zones and to estimate the scale of the gold deposit. Peculiarities of composition and structure of the metasomatic formations proves non-favorable tectonic conditions for the ore at the period of the ore deposition.

UDC 552.164

A.I. Chernyshev, V.R. Shmelev
**INTERNAL DEFORMATION STRUCTURE OF UKTUSSKY
MAFIC-ULTRAMAFIC MASSIF (MIDDLE URAL)**

The anisotropic internal deformation structure of the Uktussky mafic-ultramafic massif was shown. This structure was formed in the process of three successively revealed stages of the plastic flow. The typification and dynamo-kinematic interpretation of microstructures in olivines and clinopyroxene from dunites and clinopyroxenites was conducted.

UDC 550.31+550.34+55 (084.3)+502.58.001.18

T.S. Blinova
**CONTRIBUTION OF THE EARTH CRUST DISTURBANCE TO
FORECAST OF GEO-DYNAMICALLY UNSTABLE ZONES OF
THE WEST URAL REGION**

The relationship of the consolidated crust faults to the geodynamically unstable zones of different order is determined. Active zones of faults intersection for the West Ural region, which includes the parts of three tectonic units, that are the eastern margin of the East European craton, the Pre-Ural depression and the West Ural folding zone, are defined. The maps of different modifications of the faulting density for consolidated crust of the West Ural region are constructed, and their relationship with thermal characteristics of the sedimentary cover and basement, region block structure, regional seismicity and geodynamically unstable zones of different order is determined.

UDC 548.231:549.12:612.466.1

A.K. Polienko, O.A. Sevostianova
GENESIS OF UROLYTHES

The paper gives general information about urolythes (urinary stones), related to the objects of biological mineralogy. It also reviews several theories of these stones' generation. Five main processes resulting in formation of urolythes are described as well as the mechanisms of their possible generation, growth and changes upto destruction. The authors show that the stones are generated as a result of combination of both general and local reasons (diet, drinking, functional disorders of central nervous system, endocrine system).

UDC 533.9

V.A. Vlasov, I.A. Tikhomirov, Yu.Yu. Lutsenko
ESTIMATION OF JOULE LOSSES AND WAVE RESISTANCE IN HIGH-VOLTAGE TORCH PLASMOTRON

The paper presents equations to describe the value of the wave resistance and the value of joule losses in constructional elements of high-frequency torch plasmotron with metallic discharge chamber. The analysis was carried out using the model plasmatron as a co-axial line taking into account reflection of electro-magnetic wave in the output part of the plasmatron. It allowed to define the frequency band corresponding to the optimal working regime of the plasmatron.

UDC 626.039.553.34

S.F. Sandu
MATHEMATICAL MODELLING OF HEAT AND MASS TRANSFER IN EVAPORATIVE-CONDENSATION SYSTEMS OF POWER PLANTS

Due to such properties, as high effective thermal conductivity, capacity to transform heat flows, small mass, the heat pipes finds a use in heat-transfer units of a hyperthermal energy transforming cycles and in heat-exchange vehicles of passive security systems of power plants.

The purpose of the given operation deals with mathematical modelling of heat and mass transfer processes, proceeding in evaporative-condensation systems of power plants on the basis of heat pipes.

The problem about a thermal field of a typical heat pipe, working by a principle of a self-contained evaporative-condensation cycle, is esteemed. Designed mathematical model of a heat pipe in distributed arguments, allows to account hydrodynamics, heat and mass transfer in steam and fluid phase of heat carrier, heat transfer in the body of a pipe. Matching results of account of probable operation area, maximal heat power transmission and allocation of steam temperature lengthwise of heat pipe with known experimental data is held.

UDC 536.2:532/533; 532.516

A.V. Krainov
NUMERICAL SIMULATION OF CONJUGATE MASS TRANSFER AND HYDRO-DYNAMICS AT FLOW OF VISCOUS NON-COMPRESSIBLE NON-ISOTHERMAL LIQUID IN OPEN CAVITY WITH MOVABLE BOUNDARIES

The paper presents numerical research of movement of viscous incompressible non-isothermal liquid in open square cavity taking into account variable phase state of a liquid (crystallization) under conjugated heat exchange. Original outline of solid phase is obtained. The author investigated the influence of dynamic and geometric parameters on forming the outline of the crystallized liquid. The model parameters are shown to influence the crystallization process and conditions of heat transfer while the liquid flows in the open cavity. Hydrodynamic patterns of viscous flow in the cavity are obtained at crystallization as well as the temperature fields for the liquid and solid phases.

UDC 621.436

V.V. Gavrilov
MODELLING OF DISINTEGRATION OF A FUEL STREAM IN A DIESEL

A turbulent and cavitation nature of disintegration of a fuel stream in a diesel is explained. A new model of decay is proposed bas-

ing on the analysis of experimental effects. The author developed the procedure to calculate the size of a particle of the sprayed fuel and the vector of its initial velocity at separation from continuous jet. The calculation of fuel poly-dimensional spraying fuel is provided.

UDC 621.184.3

L.L. Lubimova
TECHNIQUE OF X-RAY MEASUREMENTS IN ANALYSIS OF INSIDE-STRUCTURAL STRESSES

The paper presents the technique of processing X-ray diffraction lines as well as a kind of approximating functions and experimental measuring of internal stresses in zone and grains of a wall of a pipe heater made of Дн-82-Ш in the power boiler at the temperature range from 48 to 700 °C. The proposed technique allows to determine the characteristic temperatures causing inside-grain cracking. It also allows to obtain the precise value of equi-cohesive temperature of starting the main crack formation. The obtained results can be applied to testing the temperature range of heat resistance and re-factoriness of energetic steels.

UDC 532.13:546.3

I.A. Tikhomirov, A.A. Orlov, D.G. Vidyayev
RESEARCHES OF VISCOSITY OF GALLIUM-LITHIUM SYSTEM

The authors studied the dependence of lithium gallium viscosity on the temperature and concentration of lithium in it. Taking into account the obtained data of lithium gallium viscosity, the authors defined the conditions of carrying out the exchange process of alkali metals in gallium-exchange systems.

UDC 541.13

N.P. Gorlenko, G.M. Mokrousov
MOVEMENT OF ELECTROLYTE AND EFFUSION OF METAL UNDER THE EFFECT OF ELECTRIC AND MAGNETIC FIELD

The authors studied the processes of effusion of metal and development of convection currents of liquids under electric and magnetic constant cross-fields. Electrolysis of copper sulfate at different concentration was taken as an example. The authors give the obtained dependencies of mass transfer and exchange at the circle axisymmetric cell on the values of magnetic induction and current density.

UDC 543:615.2

N.A. Kolpakova, E.A. Smyshlyaeva, A.A. Zavyalov, A.Yu. Dobrodeev, S.A. Tuzikov, S.A. Antipov
DETECTION OF PLATINUM BY INVERSIVE VOLTAGE-CURRENT MEASURING IN BIOLOGIC TISSUES OF PATIENTS WITH CANCER OF LUNG

The ability of different tissues and blood to concentrate platinum contained in cisplatin (used in treating the lung cancer) is studied by inversive voltamperometry. Maximal concentration was detected in tumor tissue ($29,9 \pm 0,081$ mg/kg) as compared to regional lymph nodes ($3,7 \pm 0,247$ mg/kg), lung tissue ($1,7 \pm 0,117$ mg/kg) and peripheral blood ($0,8 \pm 0,086$ mg/kg). The obtained results allow to use cisplatin as a radio-sensitizing agent to enhance irradiation effect while intraoperative radiotherapy of the patients with lung cancer of III stage.

UDC 541.183

E.A. Khanova, V.V. Korobotchkina
STUDYING THE PARAMETERS OF POROUS STRUCTURE OF TITANIUM DIOXIDE OBTAINED BY ELECTRO-CHEMICAL SYNTHESIS AT ALTERNATING CURRENT

The porous structure of titanium dioxide (obtained by electro-chemical synthesis at alternating current) is studied by the methods of differential-thermal, X-ray phase- and electron-microscope analyses. The obtained product is shown to have high values of specific surface and sorptive capacity. Certain dependencies of texture characteristics on the temperature of treatment are revealed.

UDC 536.212.33

G.J. Mamontov**EXPERIMENTAL STUDYING OF POROUS STRUCTURE OF GLASS-FIBER PLASTICS AFTER COMPLETION OF THERMAL DECOMPOSITION OF BINDING MATERIAL**

The paper presents the results of experimental study of porous structure of 4 types of glass-fiber plastics after treatment by high temperature gas flow. The dependence of the open porosity on the duration of thermal treatment is obtained. The author determined the initial porosity of the glass-fiber plastics and calculated the radii of micro- and macro-pores at different times of high-temperature heating of the samples. A physical model of forming the secondary porosity in glass-fiber plastics is formulated for process of their thermal decomposition.

UDC 666.7:66.043.1

G.I. Berdov, V.A. Lienko**PHYSICAL-CHEMICAL BASICS OF PRODUCING ADVANCED CERAMIC MATERIALS**

The paper is focused on analysis of chemical reactions in $Mg-Al_2O_3-SiO_2$ system. The preferred formation of cordierite is proved. The authors found intensifying effect of high-frequency field (40,68 MHz) on solid-phase reactions. Alloying of porous ceramics with following sintering improves the properties of the final product: strength, electric resistance, dielectric loss, etc.

UDC 53.082.5

V.P. Tspilev**DESK FOR STUDYING THE KINETICS OF EXPLOSIVE DECOMPOSITION OF CONDENSED MATTER UNDER PULSIVE LASER IRRADIATION**

The developed desk allowed in nano-second scale to study synchronously the movement of the front (irradiated) surface of the sample, luminescence of explosive decomposition and detonation front as well as electro-conductivity, acoustic repercussion and luminescence of the explosion products. It gives the possibility to investigate separately the processes ongoing within and out of the irradiated zone, while the power density of laser treatment varies from before-threshold values to the many-times above ones.

UDC 531.7.08

V.A. Vasiliev, V.A. Veremyov, A.I. Tikhonov**INVESTIGATION OF INFLUENCE OF FREQUENCY PARAMETERS ON PIEZOELECTRIC SENSORS OF PRESSURE**

The paper presents results of experimental study of the influence of vibration on piezoelectric sensors of pressure, placed within a cylinder of combustion engine. The authors evaluated the frequency parameters and they influence on informative signal. Relations between the frequency error, threshold frequency and sensitivity of the sensor are determined. Finally the paper gives certain recommendation for better design of piezoelectric sensors of pressure.

UDC 621.382.323

V.L. Kim**SYNTHESIS OF REGULATING ATTENUATOR WITH THE SMALL INTERMODULATION**

The paper presents the new method of synthesis of regulating attenuators (RA) with small intermodulation and the decoupling of the signal and control circuits. The realised schemes of the regulating element have intermodulation less than 0,3% with the frequencies no more than 100 KHz.

UDC 621.372.852.2

E.T. Protasevich**PHASE SHIFTER OF TROMBONE TYPE WITH DIELECTRIC TRANSITIONS**

The paper describes a simple and reliable device for co-ordination of movable join of waveguides, which decreases stray radiation of SHF power and excludes the arcing of waveguides of different cross-sections at their joints.

UDC 378.16:681.3

V.V. Romanenko**GENERAL PRINCIPLES OF AUTOMATION OF COMPUTER TEXT-BOOK DEVELOPMENT BY EduCAD SYSTEM**

The paper presents different aspects of development of multi-media educational courses using EduCAD software. The author gives specific features of the software and describes the problems of their coding.

UDC 591.1:681.3

V.A. Vlasov, A.A. Orlov, O.G. Berestneva, S.N. Timchenko**COMPUTER PSYCHO-DIAGNOSTIC SYSTEM FOR EVALUATION OF PROFESSIONAL SUITABILITY OF STAFF IN ISOTOPE SEPARATION PRODUCTION**

The paper presents computer-aided psycho-diagnostic system for evaluation of professional suitability of staff in isotope separation production. The authors developed the original method of testing and software to assess the individual specific abilities. The system can also be applied to career-guidance of technical university entrants.

UDC 658.5.012.1:519.252

A.I. Borodin**COMPONENTS AND STRUCTURE OF ECONOMIC AND ORGANIZATIONAL MECHANISM FOR STRATEGIC DEVELOPMENT OF AN ENTERPRISE**

The paper presents the studying of components and structure of organizational-economic mechanism of strategic development of enterprise. The author has specified the components, participants, ways to realize, expectable results and necessary resources for the strategy.

UDC 378:37.02

Yu.V. Karyakin**METHODOLOGY OF EDUCATIONAL PROCESS AT UNIVERSITY AS A RESULT OF COMPUTERIZATION. PART II**

The paper reflects continuous attempts (from 1979) to increase the quality of educational process at the lectures. A lecture is not an autonomic but a system part of the educational process as a whole because of its «key» and «starting» nature. At the same time it can give essentially positive effects under natural transformation basing on system analysis-synthesis using fresh ideas of psychology, cybernetics and informatics.

UDC 111

N.N. Karpitsky**VIRTUALITY AND TEMPORALITY**

The paper considers the categories of «virtuality» and «temporality». The category of «virtual reality» is defined basing on the analysis of transcendental structure of the time. The author compares virtual temporality, temporality of a myth and temporality of a dream.

UDC 17

I.B. Ardashkin**THE STATUS OF «VIRTUALITY» IN PROCESS OF PROBLEMATISATION OF KNOWLEDGE**

The paper considers the possibility to apply the sphere of the virtual onto the process of problematization of knowledge. The author states an assumption that not only «knowledge» can be in virtual sphere but also the being itself. This relation allows to overcome conventional disadvantages of classic scientific cognition.

UDC 13

S.G. Sycheva**CONCEPTION OF ORGANIC SYMBOLISM**

The paper presents the new approach neglecting the contradiction between the classic and postmodern theories. The author proposes the concept of organic symbolism, where a symbol is defined as a phenomenon synthesizing natural and mental worlds in the cultural sphere. It is an organism referring to universal consciousness,

from which an individual consciousness gets the ideas for substantive realization. Symbol transforms chaotic layout of being into cosmologic one.

UDC 008.001.14

M.N. Kokarevich
CONCEPT MODELING AS A FORM OF COGNITION AND UNDERSTANDING

The article showed that the modern understanding of cultural-historic reality as free-creative activity corresponds to the methodology of modeling this reality. Methodology of the modeling becomes the way of philosophizing in this research field, resulted in building the concept models of development and existence of the culture. These models are the coupling of subjective and objective characters as 1) «human subjective activity – cultural-historic reality» and 2) «system of valuables of the researcher and the cultural-historic reality – reality where the researcher is placed to».

UDC 81.13

O.I. Blinova
RESEARCH METHODS IN LINGUISTICS OF MOTIVATION

The article is dedicated to analytical methods used in a developing trend in Russian linguistics – linguistics of motivation. This new trend studies a phenomenon of word motivation, which is studied not

enough at the present moment. The author concentrates on the descriptive and lexicographic research methods.

UDC 808.2.-087.3(571.1)

E.V. Belskaya
THE INNER FORM OF A WORD AS A MEANS OF EXPRESSING THE CATEGORY OF INTENSITY

The article is focused on analyzing the inner form of an intense word as a tool to express the semantic basis of the lexico-semantic category of intensity. The study is based on the methodology of motivological analysis of the inner form of a word. Intense nouns and adjectives of Russian old-resident dialects of the Middle Ob area are the subject of the study. The study reveals the significance of the inner form and some of its components in expressing the semantics of intensity.

UDC 829

I.V. Kutcherenko
TO CENTENARY OF ACADEMICIAN YU.A. KUZNETSOV

The paper describes the life and research work of an outstanding scientist of the second half of XX century – academician, professor Yu.A. Kuznetsov. He was the head of pertography department of the Tomsk Industrial Polytechnic Institute in 1935–1959.