CONTENTS

Problems of planetology, cosmochemistry and meteoritica 5

Alexeev V.A., Pavlova T.A. Peculiarities of distribution of the gas-retention and cosmic-ray exposure ages of ordinary chondrites depending on their physical properties. UDC 550.42 5
Alexeev V.A., Kalinina G.V., Lorenz C.A., Pavlova T.A. Track studies of 2018-year falls of Ablaketka (H5) and Ozerki (L6) ordinary chondrites. UDC 550.42 7
Badekha K.A.[1], Uymin A.A.[2] Optical features of the schlieren bands in Chinga meteorite in a front reflection of light UDC 669 72 10
Barenbaum A.A, Klimov D.S. Theoretical model Anderson-Schulz-Flory as a tool to study geosynthesis mechanism UDC 551.23: 525.235 13
Barenbaum A.A.[1], Shpekin M.I.[2] Origin of craters, mares and mascons on Moon in the light of the galactocentric paradigm UDC: 550.2: 523.4-1/-8 17
Demidova S.I., Anosova M.O., Badekha K.A., Some evidence of the metasomatic activity in the lunar rocks. UDC 551.14:554.015.4 21
Dunaeva A.N., Kronrod V.A., Kuskov O.L. Thermal flux in Titan for the different composition of chondritic substance... 24
Ivanov A.A., Sevastyanov V. S., Shnykin B.A., Dolgonosov A. A., Krivenko A.P., Priymak S.V., Roslyakova A. S., Galimov E.M. Self-organization of prebiological environment in the conditions of early Earth UDC 550.47 27
Kuyunko N.S., Alexeev V.A. A procedure of identifying extraterrestrial matter on the thermoluminescent characteristics. UDC 550.42 28
Lavrentjeva Z.A., Lyul A.Yu. A comparative study of trace element concentration in heavy and light fractions from Adhi Kot EH4 enstatite chonrite. UDC 552.63 32
Lyul A.Yu., Lavrentjeva Z.A. On the siderophile element distributions between the metal and fine-grained fractions of the enstatite meteorites. UDC 542.42 35
Shornikov S. I. Thermodynamics of evaporation of perovskite – the mineral of white inclusions of chondrites 38
Tselmovich V.A.[1], Maxe L.P.[2] Cosmogenic substance from sedimentary rock, called tripoli, from the deposit field «Stalnoye». UDC 523.681 40
Ustinova G. K. Special features of the magneto hydrodynamic situation in the internal heliosphere for the 11-year cycles according to meteorite data UDC 523.165 44
Yurkovets V.P. Catastrophe layers of the near zone of Ladoga impact. UDC 551.4:552.6 47

Mineral equilibria at high PT-parameters 51

Butvina V.G[2]., Smirnova M.D.[1], Safonov O.G.[2], Van K.V.[2] Experimental modeling of subsolidus parageneses of ultramafic lamprophyres of the Irkeneeva-Chadobets trough, South -Western Siberia, at high PT-parameters. UDC 552.13 51
Butvina V.G.[1], Vorobey S.S. [2], Safonov O.G.[1], Varlamov D.A.[1] Experimental study of chromite-ilmenite-K_2CO_3-oxalic acid at 3,5 and 5 GPa. UDC: 552.13 55
Fedkin V.V.[1], Shchipansky A.A.[2]. Subduction initiation of the maksyutov eclogite-glaucophane schist complex (South Urals) UDC 549.6+552.16:552.48 59
Khodorevskaya L.I. Experimental study of diopside-fluid H_2O-Na_2CO_3 interaction under pressure gradient conditions at 750°C. 63
Kovalskaya T.N., Varlamov D.A., Shapovalov Yu.B., Kotelnikov A.R., Kalinin G.M. The specification of amphibolization process in gabbroids of Tiksheozerskiy massif (by experimental data) 66
Limanov E.V.[1], Butvina V.G.[1], Safonov O.G.[1], Van K.V.[1] Experimental study of the grossular–pyrope–enstatite+ H_2O-KCl system at 3 and 5 GPa. 69
Spivak A.V., Litvin Yu.A., Zakharchenko E.S. Experimental study of melting relations of multicomponent diamond-forming oxide-silicate-carbonate system at 15 GPa, ... 71

Thermodynamic properties of minerals and fluids 75

Korepanov Ya.I., Osadchii E.G. Modeling of a gold-silver-tellurium phase diagram by experimental temrodynamic data of phases and solid solutions. UDC 550.4.02. 75
Makarov V.P. Experimental study of natural fractionation of argon isotopes. UDC: 550.42:550.93 76
Makarov V.P. Oil. New properties: sublimates and polynomial equations. 79

Shornikov S.I.[1], Shornikova M.S.[2] Thermodynamic properties of the CaO–FeO melts 82
Shornikov S. I. Thermodynamic properties of the MgO–TiO_2 melts 85
Stolyarova T.A.[1], Brichkina E.A.[1], Osadchii E.G.[1], Baranov A.V.[1,2] Calorimetric determination of the standard enthalpy of mohite (Cu_2SnS_3) formation. UDC 544.332 89

Synthesis of minerals **91**

Balitsky V.S.[1], Balitsky D.V.[2], Balitskaya L.V.[1], Setkova T.V.[1], Bublikova T.M.[1] Crystal growth of quartz-like gallium orthophosphate by refluxed hydrothermal method UDC 549.057 91
Balitsky V.S.[1], Balitskaya L.V.[1], Pushcharovsky D.Yu.[2], Setkova T.V.[1], Kvas P.S.[1,2], Nekrasov A.N.[1], Bublikova T.M.[1], Nesterova V.A.[1,2](Ga-, Ge) - containing topaz single crystals: growth, morphology and gallium and germanium distribution UDC 549.612 92
Bublikova T.M.[1], Balitsky V.S.[1], Timokhina I.V., Setkova T.V.[1], Nekrasov A.N.[1], Krikunova P.V.[2] Morphological features of some textural varieties of natural and synthetic malachite 95
Kotelnikov A.R.[1], Akhmedzhanova G.M.[1], Suk N.I.[1], Schipalkina N.V.[2], Kotelnikova Z.A.[3], Kovalskaya T.N.[1], Van K.V.[1] Experimental study of gallium feldspars UDC 550.4:549.651.1 97
Kotelnikov A.R.[1], Schipalkina N.V.[2], Suk N.I.[1] Synthesis of as-containing feldspars and feldspathoids UDC 550.89 99
Kovalskaya T.N., Khanin D.A., Varlamov D.A., Kalinin G.M. Allanite synthesis in hydrothermal conditions. Preliminary data. 103
Nesterova V.A.[1,2], Setkova T.V.[2], Pushcharovsky D.Yu.[1], Balitsky V.S.[2], Borovikova E.Y.[1], Nekrasov A.N.[2], Bublikova T.M.[2], Kvas P.S.[1,2] Hydrothermal synthesis of gallium-, germanium bearing tourmaline's analogue.UDC 549.612.. 104
Reutova O.V.[1], Redkin A.F.[2] Structural transformations in compounds of $Ca_{2-X}Cd_XSb_2O_7$ composition, obtained by hydrothermal synthesis 106

Hydrothermal equalibria and ore formation **110**

Alekhin Yu.V., Fiaizullina R.V., Bychkov D.A. Supramolecular geochemistry of real forms transfer in the gas-phase of heterophase fluids and composition of gas hydrate of mercury in the process of its local exhaustion in frozen..... 110
Alekseyev V.A., Burmistrov A.A., Gromiak I.N. Transformation of quartz into opal in closed water–vapor system 113
Ermina O.S.[1], Bychkov A.Y.[1,2] Hydrothermal transformation of biomass *Chlorella sp.* at different temperature. UDC 550.4.02 117
Konopleva I.V.[1], Sevast'yanov V.S.[1], Telegina T.A.[2] Investigation of hydrocarbon biomarkers in bio-oil produced by hydrous pyrolysis of cyanobacteria *Arthrospira platensis* (*Spirulina)* biomass 120
Kotova N.P. Experimental study of temperature influence on niobium oxide solubility in chloride NaCl and LiCl solutions. 123
Suvorova V.A.[1], Osadchii V.O.[1,2], Akinfiev N.N.[3,4]. The solubility of cassiterite in the SnO_2-H_2O system at 400°C and 260-450 bar UDC550.4.02 124

The formation and differentiation of magmas **127**

Bezmen N.I, Gorbachev P.N. Petrochemical types of layered magmatic complexes and modeling ore-forming differentiation trends. 127
Bychkov D.A., Koptev-Dvornikov E.V. A high-precision algorithm for solving the problem of equilibrium minerals-silicate melt, not accumulating error during the computation process. UDC 552.111: 550.41 130
Chevychelov V.Y., Virus A. A. Solubility of pyrochlore, microlite and Nb/Ta ratio in granitoid melts at various alkalinity–alumina UDC 550.42 133
Chevychelov V.Y. On the solubility of natural Nb-containing loparite in granitic model aluminosilicate melts of various composition UDC 550.42 136
Kotelnikov A.R., Korzhinskaya V.S., Suk N.I., Van K.V., Virus A.A. Experimental study of zircon and loparite solubility in silicate melts UDC 550.89 138
Kotelnikov A.R.[1], Shapovalov Yu.B.[1], Suk N.I.[1], Kotelnikova Z.A.[2], Korzhinskaya V.S.[1] Liquid immiscibility and problems of ore genesis UDC 550.89:553.062 140

CONTENTS

Kotelnikov A.R.[1], Kotelnikova Z.A.[2], Suk N.I.[1], Gramenitskiy E.N.[3] Problems and tasks of experimental mineralogy and petrology UDC 550.4.02 144
Persikov E.S., Bukhtiyarov P.G., Nekrasov A.N., Shaposhnikova, O. Y. .The effect of H_2O on the chemical interdiffusion of major components (SiO_2, Al_2O_3, Na_2O, CaO, MgO) in andesite - basalt system 147
Rusak A.A.[1], Shchekina T.I.[1], Alfereva Ya. O.[1], Gramenitsky Ye.N.[1], Kotelnikov A.R.[2], Zinovieva N.G.[1], Bychkov A.Yu.[1], Akhmedzhanova G.M.[2] The effect of temperature and pressure on phase relations and the distribution of yttrium, scandium and rare earth elements in granitic system Si-Al-Na-K-Li-F-O-H. UDC 552.11, 550.42....150
Shchekina T.I.[1], Rusak A.A.[1], Alfereva Ya.O.[1], Gramenitsky Ye.N. [1], Kotelnikov A.R.[2], Zinovieva N.G.[1], Bychkov A.Yu.[1], Akhmedzhanova G.M.[2] The role of lithium in the differentiation of granite melts with extreme concentrations of fluoride and distribution of rare earth elements at a pressure of from 1 to 5 kbar UDC 552.11, 550.42. 153
Suk N.I. Interphase distribution of elements in silicate-phosphate systems UDC 550.89:553.062....157
Zharkova E.V., Lukanin O.A., Tsekhonya T.I. Redox conditions of formation of olivines and basalts from various geodynamic zones based on electrochemical measurements of the intrinsic oxygen fugacity UDC 550.843 (543.559)161

Experimental geoecology 165

Fiaizullina R.V., Kuznetsov E.V., Salavatova D.S. Sorption properties of synthetic silicon organic sorbent PSTU-3F on mercury 165
Karaseva O.N., Ivanova L.I., Lakshtanov L.Z. Modeling of strontium sorption on birnessite (δ-MnO_2) at elevated temperatures. UDC 550.4.02....168
Kotelnikov A.R.[1], Akhmedzhanova G.M.[1], Krinochkina O.K.[2] Composition of the surface water of shungite deposits study UDC550.4.02, 553.9....171
Kotelnikov A.R.[1], Akhmedzhanova G.M.[1], Krinochkina O.K.[2], Martynov K.V.[3], Kotelnikova Z.A.[4], Suk N.I.[1], Gavlina O.T.[5], Ananiev V.V.[6] Experimental study of shungite of Zaonezhie UDC 550.4.02, 553.9 173
Kuleshova M.L.[1] and Danchenko N.N.[2] Experimental study of sand-gel material as a geochemical barrier for cadmium 176
Makarov V.P. On the mechanism of weathering of orthoclase in the oil terrigena the Fergana depression. UDC 551.311.22+553.2 180
Zharikov A.V.[1], Malkovsky V.I.[1,2] A new method of experimental study of rock sample permeability UDC 552.08....183

Engineering of experiment 187

Molchanov[1] V.P., Medkov[2] M.A. Principal technological scheme of cleaning natural graphite of Russia from impurities using hydrometallurgy methods. UDC 553.22+551.2 187
Zharikov A.V.[1], Malkovsky V.I.[1,2] Transport properties of the HLW depository near field rocks – a forecast based on the experimental data UDC 621.39: 754.716....189

AUTHORS INDEX 193