

FOREWORD

This special issue of the journal covers the problems of magmatic petrology, concerning the processes of mantle-crust interaction in the geological history of Earth. Various issues pertaining to the nature and conditions of magma generation, the evolution and interaction of melts associated with mantle and crustal sources remain among the most important topics of modern geology and continue to attract the interest of leading specialists in petrology. It is the interaction between the earth's mantle and crust at different stages in the geological evolution of the planet under various geotectonic conditions that determined the nature and composition of the lithosphere itself, its structure and the patterns of distribution of various magmatic formations and related minerals, including strategic ones.

The present issue includes articles examining problems associated with magma formation under crustal conditions. It opens with an article by M.I. Kuzmin et al., which analyses the causes, nature and time of the emergence of the first granitoid melts, as well as the evolution of granite formation in the history of Earth – the phenomenon that determines its fundamental difference from the other planets of the Solar system. The article by V.N. Puchkov covers the formation of silicic igneous rocks (granites and rhyolites) constituting derivatives of various types of plumes: large igneous provinces (LIPs) and silicic LIPs (SLIPs); as well as their relationship with the type of crust and the role of continental crust melting in the formation of plume-related granite-rhyolite magmatism. Drawing on detailed petrological and geochemical studies of the Murzinka interformational granite pluton in the Urals, G.B. Fershtater and N.S. Borodina trace the changes in the composition of granite rocks derived from the anatectic melting of the sialic crust of different compositions and ages, formed during a single tectonic-magmatic stage in the Late Paleozoic. Using the example of upper mantle, lower and upper crustal xenoliths from the rocks of an Early Cretaceous olivine-basalt-basanite-nephelinite association (Makhtesh Ramon, Izrael), Z. Yudalevich and E. Vapnik consider the interaction of magmatic melt with various xenoliths, as well as their reaction products. The article by L.N. Sharpenok et al. covers diamond-bearing fluid-explosive breccias. The authors give petrographic and mineralogical characteristics of the clastic, protomagmatic and newly formed fluido-

genic material; characterise the intrusion sequence of rock varieties and the differences in diamond content associated with it; as well as propose the assessment criteria for the diamond potential of newly identified fluid-bearing breccia formations. The issues associated with the genesis of dunites from gabbro-ultrabasite complexes of orogenic areas and central-type platform massifs, the aspects of formation and interpretation of the age of zircon contained in them are solved by the team of authors (V.N. Anfilogov, A.A. Krasnobaev, V.M. Ryzhkov) drawing on the experimental study of phase equilibrium in the system $\text{MgO-SiO}_2\text{-ZrO}_2$. I.L. Nedosekova and her colleagues present new data on the age of pyrochlore group minerals from the rare-metal deposits of the Ilmeny-Vishnevogorsky complex (South Urals) indicating the multi-stage formation of rare-metal niobium mineralisation. The early stage in mineralisation is associated with the concluding stages in the crystallisation of alkaline-carbonatite magmatic system (D_3), whereas the late ore-forming stages are associated with the remobilisation and redeposition of rare-metal substance during the post-collisional evolution of carbonatite complexes (T_3).

The idea of this special issue belongs to German Borisovich Fershtater – the initiator of holding the scientific conference ‘Granites and Earth evolution: mantle and crust in granite formation’ in Ekaterinburg, in 2017. German Fershtater always considered the Urals to be a standard example of epi-oceanic orogens, an orogenic belt of mafic type, which is a natural testing ground for studying the mechanisms underlying mantle-crust interaction. The range of his scientific interests went far beyond granite petrology: they included all the most important types of Ural igneous rocks, which served as the basis for creating a special volume of the journal. It so happened, that having begun working on the issue, German Fershtater, who was full of new research ideas and plans, suddenly died. He was a remarkable person; bright and talented scientist; kind, sympathetic, considerate and principled colleague; as well as a friend and a mentor. On the 30th of September 2018 German Borisovich Fershtater – Doctor in Geology and Mineralogy, Professor, Honored Worker of Science, a leading petrologist of the Urals, a scientist known all over the world – would have turned 85 years old.

This issue is devoted to his blessed memory.

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