



## *GEOLOGICAL STRUCTURE AND MINERAL RESOURCES OF RUSSIA*

On the territory of the Russian Federation and its continental shelf, deposits of almost all types of minerals known on Earth have been identified. Russia is among the world leaders in reserves and production of a wide range of minerals (oil, natural gas, coal, iron ores, nickel, copper, gold, silver, platinoids, diamonds, apatite ores, potassium salts and some other types). Identifying new high-quality ore deposits using traditional approaches and methods is becoming increasingly difficult. The achievement of the goals specified in the “Strategy of Mineral-Raw Material Base Development in the Russian Federation till 2035” is ensured by increasing the investment appeal of exploration works, improving the quality of forecasting and exploration of new deposits and raising the efficiency of the development of the known deposits. In the course of the Strategy implementation, it is provided to solve one of the key problems: to increase the geological exploration of the territory of the Russian Federation and its continental shelf on the basis of regional and forecast-mineralogical studies.

The special geological issue of the Journal of the Mining Institute includes articles discussing the problems of domestic geological science and reproduction of mineral resources of the country.

In the article of Aleksandr B. Makeev and colleagues ([DOI: 10.31897/PMI.2022.32](https://doi.org/10.31897/PMI.2022.32)) the hypotheses of formation, age and sources of substance of the unique titanium deposits, previously considered as ancient buried placers, are critically analyzed. An alternative hydrothermal-metamorphic hypothesis of the formation of these deposits and the source of ore matter are discussed.

New results in geological mapping of the Arctic shelf and adjacent deep-water areas of the Arctic Ocean are discussed in the article by Evgeny A. Gusev ([DOI: 10.31897/PMI.2022.50](https://doi.org/10.31897/PMI.2022.50)). The perspectives of geological surveying in the Arctic regions, related to completion of mapping on scale 1:1 000 000 and local geological surveying on scale 1:200 000 in the coastal waters near the big cities and in the areas of intensive industrial development are outlined.

Three articles are devoted to the problems of diamondiferousness and conditions of diamond formation. As a result of comprehensive study of the geological structure and diamondiferousness of the northern part of the East European platform by Viktor N. Ustinov and his colleagues ([DOI: 10.31897/PMI.2022.49](https://doi.org/10.31897/PMI.2022.49)) three main prospecting models of primary diamond deposits were identified and characterized: the Karelian, the Finnish and the Arkhangelsk ones. Sergey K. Simakov and Yuri B. Stegnitskiy ([DOI: 10.31897/PMI.2022.22](https://doi.org/10.31897/PMI.2022.22)) on the basis of available experimental and mineralogical data in kimberlites isolated the post-magmatic stage of diamond formation for conditions of the shallow-well upper mantle and crust, associated with secondary mineral formation. Evgeny A. Vasilev and his colleagues ([DOI: 10.31897/PMI.2022.57](https://doi.org/10.31897/PMI.2022.57)) study the main morphological and structural-mineralogical features of 350 diamond crystals and prove the multiple stage of diamond formation in the deposits of the northern East European Platform.

A number of papers are devoted to known and potential deposits in the Urals. The article by Mikhail P. Popov ([DOI: 10.31897/PMI.2022.19](https://doi.org/10.31897/PMI.2022.19)) provides data on the distribution and composition of rare metal and gemstone deposits and occurrences in the eastern Murzinskaya-Aduyskaya anticline, within the Ural emerald band. In article of Irina L. Nedosekova ([DOI: 10.31897/PMI.2022.28](https://doi.org/10.31897/PMI.2022.28)), the geochemical features and ore mineralization of carbonatite complexes of the Southern Urals which are connected with rare-metal deposits of various ore-formation types are considered. Alexander Yu. Kissin et al. ([DOI: 10.31897/PMI.2022.46](https://doi.org/10.31897/PMI.2022.46)) present the results of study of the geological and structural position of a large Svetlinskiy gold deposit in the Kochkar anticline of the Southern Urals.



Viktor I. Alekseev ([DOI: 10.31897/PMI.2022.21](https://doi.org/10.31897/PMI.2022.21)) studied the evolution and ore content of granitoid magmatism in the Russian sector of the Pacific Ocean ore belt. A model of a typical potentially ore-bearing intrusive series of the Far Eastern belt of lithium-fluorine granites is proposed.

Two articles are devoted to the ore potential of the Kola region. Vadim L. Il'chenko and colleagues ([DOI: 10.31897/PMI.2022.44](https://doi.org/10.31897/PMI.2022.44)) conducted mineralogical, petrophysical and geochemical studies to determine the sequence and formation conditions of uranium mineralization within the Litsovsky ore occurrence. Valeriy F. Smolkin and colleagues ([DOI: 10.31897/PMI.2022.48](https://doi.org/10.31897/PMI.2022.48)) conducted a comprehensive study of the lenticular formation body of ultramafic composition in the Monchegorsk ore district, penetrated by structural hole M-1 at a depth of about 2.2 km. The object is a unique example of a magma-supplying system for an ore-bearing stratified intrusion of Precambrian age.

A number of papers are an example of successful solution of regional geological problems by local dating of zircon, the main geochronometric mineral. In the article of Aleksandr N. Sirotkin and Aleksandr N. Evdokimov ([DOI: 10.31897/PMI.2022.20](https://doi.org/10.31897/PMI.2022.20)) the age, composition and origin of the sedimentary-vulcanogenic and intrusive formations of the Chamberlain valley area (Spitsbergen Archipelago) are considered, and two stages of the Late Precambrian endogene activity of this region are revealed.

Article by Nikolay B. Kuznetsov and coworkers ([DOI: 10.31897/PMI.2022.37](https://doi.org/10.31897/PMI.2022.37)) gives the results of U-Pb isotopic dating of zircon from plagioclites within the "Fiolent" training facility (Crimean Mountains), which age from above limits the time of the whole ophiolitic association of Cape Fiolent. ([DOI: 10.31897/PMI.2022.41](https://doi.org/10.31897/PMI.2022.41)) present the results of geochemical isotopic studies of zircon from rare-metal pegmatites of the Ohmylk deposit (Kola Peninsula). The obtained geochronological data indicate the Neo-Archean time of the deposit formation and reflect the global era of pegmatite formation, which is associated with the formation of the world's largest rare-metal deposits.

It is impossible to solve many geological problems without a special study of ore and accessory minerals, which are indicators of rock and ore formation processes. Sergey G. Skublov and colleagues ([DOI: 10.31897/PMI.2022.40](https://doi.org/10.31897/PMI.2022.40)) for the first time carried out a large-scale study of the geochemical characteristics of beryl, including the composition of all known varieties. The results were processed by methods of multivariate statistics. Studies of Sergey B. Felitsyn and Nadezhda A. Alfimova ([DOI: 10.31897/PMI.2022.47](https://doi.org/10.31897/PMI.2022.47)) have shown, that maximum concentration of gold in biogenic apatites from Ordovician deposits is revealed within the Ladoga-Baltic suture zone of the East European platform, thus the gold mineralization has superimposed character. Sergey G. Kovalev and Sergey S. Kovalev ([DOI: 10.31897/PMI.2022.54](https://doi.org/10.31897/PMI.2022.54)) studied ore Fe-Ti-Cr mineralization of rocks of differentiated (stratified) bodies of the western slope of the Southern Urals. The structure of the Kusinsko-Kopansky complex proposed by the authors greatly increases its prospects for platinoids, sulfide copper-nickel mineralization and chromites. Dmitry A. Petrov and colleagues ([DOI: 10.31897/PMI.2022.42](https://doi.org/10.31897/PMI.2022.42)) investigated unique sulfide ore samples from the Norilskoye ore field collections of the Mining Museum and obtained high quality images of rare minerals, detailed information on the museum objects, compiled their scientific passport.

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