

Geochemical Evolution of Magmatic Rocks in the Earth's History

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The investigation is based upon the information stored in the data base on geochemistry and petrochemistry of rocks from the eastern part of the Russian Far East. The data base comprises about 18 000 samples of rocks distributed within the territory about 1 000 000 sq.km. Each sample has been analysed for a wide variety of macro- and microcomponents. The data base was compiled based on the programme using a uniform method of sample collecting and analysis. The territory of the Russian Far East south has a complicated geological structure. Magmatic complexes of Archean through Cenozoic age occur within it. The average concentrations of a number of elements (Rb, U, Th, etc.) increase in Archean – Proterozoic – Paleozoic – Mesozoic - Cenozoic granite, granodiorite, diorite, and gabbro. In particular, the average concentrations of rubidium in the above mentioned age groups gradually change within the following limits: from 0.0138% to 0.0174% (granite); from 0.0075% to 0.0107% (granodiorite); from 0.0048% to 0.0085% (diorite); from 0.0025% to 0.0046% (gabbro). The same pattern of the average concentrations' increase in all the above mentioned types of rocks has been determined for K₂O. The average CaO concentrations within this age range decrease. The differences between the average concentrations' values in the neighboring age units in a great majority of cases are statistically significant. These results were obtained for a big and heterogeneous in geological sense part of the Earth's crust for the age interval covering the whole geological history of the Earth. Thus, the irreversible geochemical and petrochemical evolution of magmatic rocks can be regarded as a fundamental regularity in the planet's life.