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ГЕНЕТИЧЕСКАЯ ИНТЕРПРЕТАЦИЯ ИЗОТОПНОГО СОСТАВА БЛАГОРОДНЫХ ГАЗОВ ФЛЮИДНЫХ ВКЛЮЧЕНИЙ МИНЕРАЛОВ КАМЕРНЫХ ПЕГМАТИТОВ

A. V. KOZLOV, Yu. B. MARIN. GENETIC INTERPRETATION OF ISOTOPIC COMPOSITION
OF INERT GASES FROM FLUID INCLUSIONS IN MINERALS OF PEGMATITES

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On the base of data on isotope composition of inert gases in the present day hydrothermal systems it is shown that their fluid-dynamic regime made an important influence upon the ratio of mantle, crustal (radiogenic) and atmospheric Ar and He in thermal springs. Obtained in this way results are used for the genetic interpretation of published data on isotope composition of Ar and He from fluid inclusions in quartz and some other minerals from chambered pegmatites of Volyn', Kazakhstan, and greisens of Akchatau deposit. The chambered pegmatites of these two regions are characterized by close values of the ratio $^3\text{He}/^4\text{He} = (22-24) \cdot 10^{-8}$ in the mineralforming media inclusions within quartz and topaz, which is an order higher than values typical for crustal rocks and may be considered as a result of participation of the mantle originated fluids within formation of the pegmatite-bearing granites and the mere pegmatites. Isotopic ratios $^{40}\text{Ar}/^{36}\text{Ar}$ in the same fluids testify to significant part of an atmospheric component (about 90 %) in Kazakhstan pegmatites along with its low participation (about 10 %) in pegmatites of Volyn'. This phenomenon could be connected with formation of the pegmatite-bearing granites in Kazakhstan within the more open system relatively to the system of the Korostensky granite pluton formation. Comparison of ontogenetic peculiarities of quartz crystals from pegmatites of two regions, as well as the study of fluid inclusions in them have shown an increase of the openness degree along with dynamism of corresponding fluid systems in a row: chambered pegmatites of Volyn' – Kazakhstan chambered pegmatites – Akchatau greisens.