

Thermochronology and mathematical modeling of the formation dynamics of rare-metal-granite deposits of the Altai collision system(Article)(Открытый доступ)

[ТЕРМОХРОНОЛОГИЯ И МАТЕМАТИЧЕСКОЕ МОДЕЛИРОВАНИЕ ДИНАМИКИ ФОРМИРОВАНИЯ РЕДКОМЕТАЛЛЬНО-ГРАНИТНЫХ МЕСТОРОЖДЕНИЙ АЛТАЙСКОЙ КОЛЛИЗИОННОЙ СИСТЕМЫ]

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Просмотр дополнительных организаций

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The article presents an event correlation of the Permian-Triassic granites of the Altai collision system, which are associated with industrial ore deposits and occurrences (Mo-W, Sn-W, Li-Ta-Be). The multi-system and multi-mineral isotope datings of igneous rocks and ore bodies (U/Pb, Re/Os, Rb/Sr, Ar/Ar-methods) suggest the postcollisional (intraplate) formation of ore-magmatic systems (OMS), the duration of which depended on the crust-mantle interaction and the rates of tectonic exposure of geoblocks to the upper crustal levels. Two cases of the OMS thermal history are described: (1) Kalguty Mo-W deposit associated with rare-metal granite-leucogranites and ongonite-elvan dykes, and (2) Novo-Akhmirov Li-Ta deposit represented by topaz-zinnwaldite granites and the contemporary lamprophyre and ongonite-elvan dykes. For these geological objects, numerical modeling was carried out. The proposed models show thermal cooling of the deep magmatic chambers of granite composition, resulting in the residual foci of rare-metal-granite melts, which are known as the petrological indicators of industrial ore deposits (Mo-W, Sn-W, Li-Ta-Be). According to the simulation results concerning the framework of a closed magmatic system with a complex multistage development history, the magmatic chamber has a lower underlying observable massif and a reservoir associated with it. A long-term magmatic differentiation of the parental melt (a source of rare-metal-granite melts and ore hydrothermal fluids) takes place in this reservoir. © 2019 Institute of the Earth's Crust. All rights reserved.