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RARE-EARTH MINERALS IN ROCKS OF THE KATUGINSKOE RARE-METAL DEPOSIT
(EAST TRANSBAIKALIA): BEHAVIOR OF LANTHANIDES AND Y
DURING CRYSTALLIZATION OF THE SATURATED-IN-FLUORINE AGPAITIC MELT

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Chemical composition of principal rare-earth minerals in aegirine, aegirine-arfvedsonite, arfvedsonite and annite-riebeckite-arfvedsonite granites of the Katuginskoe rare-metal (Ta-Nb-Zr-Y, with cryolite) deposit occurring in the southwest part of the Aldan Shield has been studied. Rare-earth mineralization in those granites is represented by two its types: 1) dissemination of pyrochlore grains and in, a lesser degree, of other Nb-Ln-oxides, Ln-phosphates and Ln-fluorine carbonates in association with zircon, ilmenite, sphalerite, etc. and 2) an interstitial type formed by intergrowths of Ln-fluorides. This interstitial type is characteristic mainly to arfvedsonite granites. Crystallization of rare-earth oxides, phosphates and fluorine carbonates from the silicate melt has caused the fractionation of, predominantly, Ln_{Ce} and, partly, of Y and Ln_Y . The presence of interstitial intergrowths of gagarinite-(Y), tveitite-(Y), yttrifluorite and fluocerite-(Ce), as well as inclusions of these minerals in zir-

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con and pyrochlore, suggests that their formation was connected with the separation of fluoride calcium melt with concentrated Na, Sr, Y and lanthanides, predominately Ln_{Ce} -Sm. Crystallization of the fluoride melt took place at the late magmatic-postmagmatic stage. Formation of bastnaesite-(Ce) rims around gagarinite-(Y) segregations and replacement of tveitite-(Y) by bastnaesite-(Ce) indicates the effect of a Ln-fluoride fluid rich in CO_2 separated during crystallization of the silicate melt. Hydrothermal change of pyrochlore accompanied by Ln remobilization and formation of veins of the low-temperature bastnaesite-(Ce) suggests an increase of the F concentration in water-carbonic fluid after finished crystallization of fluoride melts.

Key words: alkaline granites, rare-earth elements, pyrochlore, gagarinite-(Y), fluocerite-(Ce), yttrifluorite, bastnaesite-(Ce), fluoride salt melt.