

Late-mesozoic adakite granites of the northern end of Great Khingan (Russia)

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In the frames of the Northern edge of Big Khingan (Russia) the subalkaline granitoids aged 145-138 Ma [2] are identified. These are high-potassium representatives of the calc-alkaline series with increased concentrations ($\text{Na}_2\text{O}/\text{K}_2\text{O}=1.35-1.81$), moderate titanium, peraluminium. The rocks are characterized by an increased presence (in ppm) of Sr (670-910), Ba (510-1290), Rb (82-148), Th (8.45-13.1) and decreased Nb (4.0-5.7), Ta (0.4-0.63), Zr (103-190) and anomalously lowered HREE (ppm): Ho (0.10-0.22); Er (0.25-0.54); Tm (0.03-0.07); Lu (0.02-0.05), as well as La (11.34-34.21), Y (3.0-6.0), Yb (0.17-0.42). On the REE graphs, the Eu-i anomaly is positive or weakly manifested ($(\text{Eu}/\text{Eu}^*)_n=0.77-1.23$ with high values of $(\text{La}/\text{Yb})_n=26.45-64.13$. By the ratio Sr/Y-Y [1] and $(\text{La}/\text{Yb})_n - \text{Ybn}$ [3], the rocks are projected onto the field of typical adakitic series of the world. And according to the ratio of petrogenic and rare elements [4] they belong to high-silica adakites. According to the ratio $(\text{Sm}/\text{Yb})_{\text{SN-Yb}}$ [5], granitoids correspond to "classical" adakites, whose formation occurred at a depth of more than 50 km due to the melting of eclogite with a 50% garnet content. This is confirmed by the geological structure of the territory. There are developed supracrustal Precambrian formations [2]. By definition, classical adakites are rocks with high Sr/Y values, with high concentrations of Sr (>540 ppm) and LREE; low Y (<15 ppm), and depleted HREE in the absence of obvious Eu anomalies, low MgO, Ni, and Cr. All these characteristics are established in the subalkaline granites of the northern flank of the Great Khingan, which allows us to classify them as "classical adakites".

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