

Alkali-mafic magmatism as exemplified by the University foidolite-gabbro pluton, NE Kuznetsk Alatau ridge, Siberia

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The main events of continental and oceanic alkali magmatism often coincide with periods of plume activity [1, 2]. In contrast to platforms, the manifestation of magmatism of folded regions is characterized by signs of mantle-crustal interaction [3, 4, and 5]. One of the examples of the manifestation of alkali magmatism is the erupted province of Kuznetsk Alatau in the western part of the Central Asian orogenic belt (CAOP) [4]. Sources of juvenile melts are characterized by heterogeneity due to plume-lithosphere interaction.

As a result of mantle activity within the Kuznetsk Alatau, small-sized (up to 1-3 km²) differentiated alkali-mafic intrusive massifs were formed, composed in different ratios by subalkali and alkali gabbro, basic and ultrabasic foidolites, nepheline and alkali syenite.

Conclusion

The question of the age of alkaline-mafic magmatism on the northern slope of the Kuznetsk Alatau is debatable. Precise isotope-geochronology studies (Sm–Nd, Rb–Sr, U–Pb, Ar–Ar) made it possible to distinguish three age boundaries of alkaline intrusions [4, 6], corresponding to Cambrian and Early Ordovician (510–480 Ma), Early and Middle Devonian (410–390 Ma), Late Permian (~ 265 Ma).

One of the representatives of this province is the studied foidolite-gabbro University massif [7]. For the first time, geochemical (ICP–MS) and isotope-geochronology (Sm–Nd, Rb–Sr) [8] studies of its rocks were carried out, which suggest sequential formation of intrusions in the Early and Middle Paleozoic interval, as well as the complex geodynamic setting of melt penetration.

The reported study was funded by RFBR, project number 19-35-90030. Isotope-geochronology studies carried out at the expense of the Russian Science Foundation project number 18-17-00240.

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