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# Large Igneous Provinces of the Central Asia: data on geochronology, geochemistry and petrology of the Tien Shan and Junggar basaltic complexes

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During last years Large Igneous Provinces of the Central Asia were an object of steadfast attention of researchers. It was established that on a formation and development of continental earth crust a great influence was rendered by deep magmatic systems of mantle plumes of various age. Undoubtedly that these global processes of basaltic magmatism had in many respects crucial importance for ecology, climate and life development.

Our researches of magmatic associations of the Tien Shan and Junggar have allowed to accumulate a considerable volume of new data on geochronology, geochemistry and physico-chemical parameters of petrogenesis of within-plate basaltic complexes of the Central Asia, which area of distribution covers territory over than 285000 km2.

Analysis with the help of 40Ar/39Ar method has shown that the basaltic complexes of the Tien Shan have Cretaceous-Paleogene age (61-76 Ma). Basalts of the Southeast Kazakhstan (North Tien Shan) corresponds to Paleozoic age: 305-312 Ma. Rather close values of 40Ar/39Ar data are received for basalts of the Altynemel Ridge (South Junggar) - 282 Ma. Isotope 40Ar/39Ar dating of basalts of the Alakol site (Junggar) has shown Mesozoic age (186-198 Ma). As a whole, the carried out researches testify to formation of Tien Shan and Junggar within-plate basalt complexes as a result of influence of three plumes, operating in various time: Tarim (282-312 Ma), Junggar (186-198 Ma) and Tien Shan (61-76 Ma).

Data on petrochemistry, geochemistry of trace and rare-earth elements and mineralogy shows an enriched plume characteristics (close to OIB) of Mesozoic-Cenozoic basalts and presence of group of Paleozoic rocks close to continental and oceanic plateau basalts. As a whole, successive evolution in time of geodynamics of within-plate basalt magmatism of Tien Shan and Junggar is established. Paleozoic - plateau basaltic magmatism like Siberian traps or oceanic plateau basalts of Ontong Java. Mesozoic - development of more local hot spot like Hawaiian islands or island Bouvet (South Atlantic). Mesozoic-Cenozoic - multichannel (cluster) mantle alkaline magmatism.

On the basis of data on melt inclusions in minerals from Tien Shan Cretaceous-Paleogene basalts a sharp change of magmatic system temperature from 1245° to 1110° is established at transition from olivine formation to clinopyroxene crystallization with falling $TiO_2$, $Al2O_3$, FeO and MgO in melts against a background of $SiO_2$ growth. High contents of carbon dioxide in melt inclusions are determined. The fluid pressure in the melt, calculated from $CO_2$-containing inclusions, varies from 4 to 8.4 kbar at 1220-1250°. Such enrichment of magma by carbon dioxide had rendered a great influence on the environment during eruption of melts.