Timing Evolution of the Paleozoic Alkaline Basic Magmatism of the Kuznetsk Alatau, Siberia

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In the western part of the Central Asian Orogenic Belt (CAOB), which is in the North-West of the Kuznetsk Alatau (KA), quite small (~ 1–2 km2) differentiated alkaline-basite intrusives are localized. They are represented by different-age associations of K–Na type middle and strong alkaline gabbroids, basic and ultrabasic foidolites, nepheline and alkaline syenites, and carbonatites. It is supposed that they have mantle nature and could form under the conditions of plume-lithosphere interaction on the active margin of the Siberian paleocontinent. A few Rb–Sr, Sm–Nd, U–Pb isotopic geochronological data indicate possible intrusion to happen at the Middle Cambrian–Early Devonian [1].The U–Pb dating of zircons that we have made (SHRIMP–II, LA–ICP–MS) in alkaline rocks from several petro-type plutons of the KA demonstrates that their formation was completing during a longer period. The zircons of the most representative population have isotopic age ~ 480–490 Ma, which is typical for many other manifestations of different formation-type magmatism of the Early Paleozoic large igneous province CAOB [2]. For zircons with another generation type, another age is defined in the range of ~ 385–400 Ma corresponding to the Early-Middle Devonian. Some solitary grains of zircons at the Late Permian age ~ 265 Ma were found in a sample of nepheline syenite from one of the intrusive massifs. Based on previous and new isotopic data, it is assumed that there were three stages of manifestation of the Paleozoic alkaline-basic magmatism in the KA: during the Cambrian-Early Ordovician, Early-Middle Devonian, and Late Permian. In this case, its development could occur under the conditions of mantle activation and permanent impact by both North-Asian and Siberian plumes [3].

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[1] Vrublevsky *et al* (2004) *Doklady Earth Sciences*. **398**, 990-994 [2] Vrublevskii *et al* (2012) *Russian Geology and Geophysics*. **53**, 721–735 [3] Kuzmin *et al* (2010) *Earth-Science Reviews*. **102**, 29–59