

## **New Data on the Timing of Mafic Magmatism in the New Siberian Islands From $^{40}\text{Ar}/^{39}\text{Ar}$ Isotope Dating**

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### **ABSTRACT**

The New Siberia Islands is located at the border between the Laptev and East Siberian seas, where Paleozoic and Mesozoic strata are exposed. Here we present the results of new  $^{40}\text{Ar}/^{39}\text{Ar}$  dating of mafic dykes and basalt. Jeannette Is. The dykes of W-NW and more rarely NE strike intrude into the Uppermost Cambrian–lowermost Ordovician(?) folded strata, and locally are deformed by the low-amplitude faults and brittle-ductile shear zones. The  $^{40}\text{Ar}/^{39}\text{Ar}$  isotope age of plagioclase from one of the dykes is estimated to  $497.23 \pm 1$  Ma (Late Cambrian). Henrietta Is. Uppermost Cambrian–lowermost Ordovician(?) volcanoclastic rocks are overlain by a thick basalt sequence in the southwest of the island. The  $^{40}\text{Ar}/^{39}\text{Ar}$  isotopic age of plagioclase from the basalt is  $491.22 \pm 2.2$  Ma (Late Cambrian).  $^{40}\text{Ar}/^{39}\text{Ar}$  dating of plagioclase from two W-NW- striking deformed dolerite dykes cutting the lowermost volcanoclastic rocks yielded  $562.15 \pm 0.82$  Ma and  $562.71 \pm 8$  Ma (Ediacaran). These values overlaps with the age of  $553.6 \pm 10.3$  Ma obtained by Matushkin et al. (2016) for the dolerite dykes from Jeannette Is. Bel'kovsky Is. Devonian-Permian sedimentary rocks are cut by dykes and large plutons of dolerite striking mainly to NW.  $^{40}\text{Ar}/^{39}\text{Ar}$  ages of plagioclase from the dolerite dykes in the south of the island are  $245.57 \pm 3.94$  Ma and  $235.25 \pm 0.95$  Ma (Early-Late Triassic). U-Pb zircon dating of single mafic dyke in the northwest of the island yielded age at ca. 250 Ma (Kuzmichev, Pease, 2007). NW Kotel'nyi Is. Devonian to Triassic succession is cut by rare dolerite dykes of NW strike. The  $^{40}\text{Ar}/^{39}\text{Ar}$  age of amphibole from one of the dykes is  $128.88 \pm 20.77$  Ma (Early Cretaceous). Thus, new  $^{40}\text{Ar}/^{39}\text{Ar}$  dates point to the occurrence of several events of mafic magmatism across the New Siberian Islands. The earliest Ediacaran dykes are identified in the Henrietta Is. This suggests no younger than Neoproterozoic age for the lower part of the volcanoclastic succession of Henrietta Is. Then the Late Cambrian dykes and basalt were formed. Since the upper part of the section in Henrietta Is. comprises relatively thick basalt unit, therefore the volcanoclastic rocks are not younger than Late Cambrian. Early-Late Triassic and Early Cretaceous mafic dyke have been dated within Bel'kovsky and Kotel'nyi Islands, the latter may be related to HALIP. This research was supported by RFBR grant 16-55-20012, DPMGI SB RAS XI.124.1.6, Project N 53 (program of Russian Academy of Sciences N 32P).