



Igneous rocks of Arctic Ocean deep sea ridges: new data on petrology, geochemistry and geochronology

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The aggregate results of studies of igneous rocks, collected from the central part of the Arctic Ocean during scientific marine expeditions «Arctic-2000, 2005, 2007 and 2012» are presented and discussed in the frame of modern understanding of High Polar Arctic tectonic constraint.

Petrological, geochemical and isotope-geochronological studies of more than 500 samples have shown that the sedimentary rocks are of dominated population among the rock fragments dredged from deep-sea bottom, and represented by metamorphosed dolomite and quartz sandstone, limestone, sometimes with the Devonian - Permian fauna. Igneous rocks are 10-15% only (Archean and Paleoproterozoic gneissous granites and gabbro, Neoproterozoic dolerite) and metamorphic rocks (green shales, metabasites, gneisses). Apparently, these rocks are part of the acoustic basement underlying the Late Mesozoic - Cenozoic layered loose sediments.

In addition to the dredged fragments of the ancient mafic rocks, some samples were taken as a core during deep-water drilling in the northern and southern slopes of the Mendeleev Ridge and represented by trachybasalts, marking the border of Late-Cenozoic deposit cover and acoustic basement and quite similar in composition to those of Early-Late Cretaceous basalts from northward of the Chukchi Plateau seamounts, Alpha Ridge, Franz Josef Land, De Long islands and other parts of the large igneous province of the High Arctic (HALIP).

Video-filming of Mendeleev Ridge escarpments proves the existing of rock outcrops and supports local origin of most of the rock fragments found in the sampling areas. Thus the continental type of the earth's crust of the Central Arctic Ridges basement is based on all obtained results of our study of sea-bottom excavated rock material.