

Upper mantle beneath Northern Eurasia: evidence from xenoliths in Post-Miocene Alkaline Basalts

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It is commonly accepted that alkaline basaltic magma is derived from the mantle at greater depths than tholeiitic magma. The volcanic products often contain xenoliths of deep-seated rocks, which differ from the host basalts in composition and age. These xenoliths bear information on the composition and properties of the the upper mantle level material, processes occurring there.

Post-Miocene volcanic products are known in the eastern and western sectors of Northern Eurasia. On Spitsbergen, De Long Islands, Cape Navarin and on Chukchi Peninsula they bear nodules of spinel lherzolites with chrome diopside, pyroxenites and websterites. Corresponding age of volcanic eruption are: 2.7 - 1 Ma(K-Ar), 6.1 - 0.4 Ma(K-Ar;Ar-Ar), 1.45 - 1.59 Ma (K-Ar), 10-3.9 Ma(K-Ar) and it took place a peak within the interval 2.5-1 Ma. On Spitsbergen, the areas of younger volcanism are situated closer to a coast of Arctic ocean on orthogonal riftogenic structure. Very short geological time interval of the volcanism makes possible to consider that mantle level 75 - 90 km of Northern Eurasia was sampled almost at the same time.

A chemical composition of lherzolites xenoliths is complementary to the host basalt compound as it is in another regions of the Earth. The spinel lherzolites are depleted in Fe, Al and are associated with basaltic lavas enriched of these components. There is a distinct negative correlation of Cr_2O_3 and positive - of MgO . It is regular increasing content of SiO_2 , Cr_2O_3 , K_2O in lherzolitic xenoliths along the coast of Arctic ocean from the West to the East.

Lateral compositional variability of peridotite xenoliths shows more primitive trend in Asian sector then in Europe one. Contents of CaO and K_2O in xenoliths of Asian volcanoes are equal or more of the elements in pyrolite. K_2O in xenoliths of Cape Navarin volcano is in 1.7 times higher then it is in pyrolite. The elevated contents of K_2O were also marked in alkaline basic lavas of Central Asia and of Eastern Asia - Primorie. So we can say about the real occurrence of a positive potassium anomaly in the upper mantle under the Northern sector of the Asian continent.

The deep-seated peridotites of Northern Europe differ from those of Northern Asia in more lower TiO_2 and higher MnO contents, at low - FeO and Cr_2O_3 components.

The Post-Miocene alkaline basaltic magmatism of The Northern Eurasia was connected and caused by the opening of The Arctic Ocean. The Ocean crushed and cutted firstly European then Asian continental blocs with Upper mantle beneath their. Most deeper trace of the opening of the Ocean is fixed in composition of peridotitic xenoliths and host basalts.