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Trace Element and Sr-Nd Isotope Inference on Source of the Late Cenozoic Alkaline Basalts in the Western Khubsugul Area

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Alkaline basaltic volcanism in the western Khubsugul area (Northern Mongolia) took place during two distinct the Early and Late Miocene episodes. Volcanic rocks of different age are distinguished through K-Ar and Ar/Ar dating and their location in relief. Despite the age difference the volcanic rocks are similar in major and trace element compositions, spanning between two end-member types. One type of the basalts is similar to the OIB and is best explained by 1-3 % partial melting of garnet-bearing asthenospheric mantle. Another type of the basalts shows crustal signatures such as depletion of Nb relative K, enrichment of Sr and Pb relative Ce and Pr. In Sr-Nd-isotope and trace element combined diagrams, the Early and Late Miocene basalts show different trends. The Late Miocene OIB-type and crustal-signature-type basalts have moderately depleted and enriched Sr-Nd-isotope features, respectively (eNd +3, 87Sr/86Sr 0.7041 and eNd -2, 87Sr/86Sr 0.70495, respectively). 87Sr/86Sr and 1/Sr ratios are positively correlating. However, the Early Miocene OIB-type and crustal-signature-type basalts show enriched and depleted isotope signatures, respectively, opposite to that of the Late Miocene basalts. In 87Sr/86Sr vs 1/Sr the Early Miocene basalts are negatively correlating. The reason for the crustal trace element signatures in the western Khubsugul basalts is not clear. It could be explained by in situ crustal contamination for the Late Miocene basalts, but recycled origin of these signatures related to Pacific slab subduction in the Early Miocene basalts is more likely. (Study is supported by RFBR 05-05-64477 and MK-1588.206.5).