

8th Annual Congress on
Analytical and Bioanalytical Techniques
&
14th International Conference and Exhibition on
Pharmaceutical Formulations

August 28-30, 2017 Brussels, Belgium

Geochemistry of plio-quadernary alkali basalts from Kozdağ (Muş) district, Bitlis Zagros Suture (BZS) zone, SE Anatolia, Turkey

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Plio-quadernary alkaline basalts from Kozdag (western Muş) district, SE Anatolia, erupted at the collision-related Arabian-Anatolian plate boundary, in front of the Bitlis-Zagros Suture (BZS) zone. The lavas are made up by olivine, plagioclase, clinopyroxene and opaque Fe-Ti oxides. Geochemically, they exhibit a range of SiO₂ (47.15 to 50.29 wt %) and MgO (2.7 to 7.03 wt %), and are relatively enriched in TiO₂ (1.88 to 3.11 wt %), Na₂O (3.5–4.0 wt.%), and resemble those of alkaline basalts from other plio-quadernary BZS zone (e.g. Nemrut, Solhan and Varto districts) and Karacalidag district (the foreland of Arabian plate). Cr (0.002-0.019 wt.%) and Ni (10-77 ppm) contents are moderate in composition. Trace element variations also clearly demonstrate that there is a distinct geochemical variation for Kozdağ basalts [e.g. HFSE depletion in Nb (6.7-27.8 ppm), and Ta (0.5-1.9 ppm), and enrichment in Zr (163-355 ppm), Y (31-63 ppm), moderately Th (1.2-6.5 ppm) and LILE enrichment in Ba (100-227 ppm) and Sr (412-518 ppm)]. These compositions, resembling to those of Karacalidag foreland Arabian plate basalts, reflect strong affinities to enriched continental lithospheric mantle, rather than lower crust assimilated asthenosphere. Despite the previous models proposed, the absence of lithospheric mantle beneath the eastern Anatolia continent, our data do not confirm it, and on the contrary suggest the presence of (probably metasomatised) lithospheric mantle beneath the region. It is suggested that Kozdağ (Muş) basaltic magma, from BZS zone, were probably derived from the small degree partial melting of (probably amphibole-bearing) spinel peridotitic lithospheric mantle source interacting with asthenosphere, and metasomatised lithospheric mantle domains played a significant role on their genesis.

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