Petrology of the Middle Eocene volcanic rocks of Almacik Mountain, NW Turkey

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The Almacik Mountain is a composite terrain which consists of two different basement rocks and its cover. The basement is represented by the rock units of the Istanbul-Zonguldak Paleozoic succession, a metamorphosed ophiolitic association, and the slightly metamorphic units which are equivalents of the Sakarya continent. These units collided before early Tertiary period because of the total consumption of the northern Neo-Tethys ocean. Following the collision, a new transgression occurred and was deposited the shallow marine sediments. A severe volcanic activity accompanied the deposition, coevally. We present new K-Ar ages, Sr, Nd, Pb and O isotopes and geochemical data for Almacik Mountain volcanic association. It begins with basic lavas and related pyroclastic rocks at the bottom and followed by intermediate to acidic lavas at the top. Radiometric age datings reveal that volcanism was active between 48.7±4.1 and 41.1±1.6 Ma corresponding to the Middle Eocene.

The Mid Eocene volcanic rocks are calcalkaline and display low to medium-K character. Significant enrichments in LILE (Sr, K, Ba, Rb and Th) and impoverishments in Ta, Nb, Ti and P indicates the subduction and crustal contamination had played an important role in the evolution of magma. However, initial Sr and Nd isotope values ($^{87}Sr/^{86}Sr_i$: 0,70418-070523; $^{143}Nd/^{144}Nd_i$: 0,512503-0,512857) and εNd content (-1,5 - + 5,4) of the lavas are comparable to the bulk Earth and mantle array compositons. Also, lead isotopic values ($^{206}Pb/^{204}Pb$: 18,676-18,806; $^{207}Pb/^{204}Pb$: 15,609-15,633; $^{208}Pb/^{204}Pb$: 38,635-38,857) of the Almacik volcanic rocks cluster in an area between bulk Earth and mantle fields and point out the source of the lava is similar to enriched mantle (EM II). $\delta^{18}O$ contents of the lavas (8,5-13) may possibly reflect the variable amount of contribution of the continental crust during the magma genesis.

Geochemical and isotopic data are evaluated together, it may be suggested that partial melting of the subcontinental lithospheric mantle and FC-AFC were important processes for the evolution of the magma that produced the volcanic association of Almacik Mountain, during Mid Eocene (Bruxellian-Bartonian).

Elemental analysis of USGS GSE-1G and BCR-2G by LA-ICPMS. Quantification using different laser systems and ICPMS instrtuments

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Different combinations of laser ablation (LA) units and inductively coupled plasma mass spectrometers (ICPMS) were used to investigate the influence of laser wavelength (266 nm ns, 193 nm ns and 265 nm fs) and ICP operating conditions of two different ICPMS instruments (PE/Sciex Elan 6100 DRC and Agilent 7500 cs) on elemental analysis of the glass reference materials BCR-2G and GSE-1G. Results obtained after calibration using NIST 610 were compared to data listed in the GeoRem database [1] to estimate the influence on accuracy for the respective approaches.

ICP optimization was carried out under two prepositions: one set of data was acquired after optimization for highest sensitivity of the ICPMS used while only ensuring a ThO^+/Th^+ ratio of less than 0.3%, while a second optimization strategy included ensuring that U^+/Th^+ intensity ratios were maintained at ≈ 1 during calibration using NIST 610 [2]. 47 isotopes were montiored and the largest deviations from the references values were observed for the 266 nm laser when the ICPMS were optimized for highest sensitivity only. Inlcuding the U/Th ratio improved the accuracy significantly. Differences between the results for the two ICPMS were small, with exception of ^{57}Fe, which suffered from higher spectral interference by $CaOH^+$ on the Agilent 7500cs.

Additionaly there was evidence for heterogeneous distribution of Er and Th in the speciment of GSE-1G which can only be explained by sample preparation.

[1] Jochum *et al*., GeoRem database, http://georem.mpch-mainz.gwdg.de/ [2] Wang *et al*. (2006) *J. Am. Soc. Mass. Spectrom.* **17**, 641.