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Petrological and geochemical characteristics of Yenice volcanics, South of Ankara, Turkey

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Yenice (South of Ankara) volcanic rocks outcrop mainly as pyroclastic deposits, dacitic, andesitic lava/domes and minor amout of basaltic rocks. 40Ar/39Ar ages show that Yenice volcanics were erupted during Early Miocene time (Kurt et al., 2008). In order to understand petrological evolution of Yenice volcanics, their mineralogical, petrographical and geochemical characteristics were studied on by analysing 53 rock samples. Plagioclase and pyroxene minerals were observed in all of the samples, whereas olivines are present solely in trachybasalts and basalts, amphiboles in andesites and dacites, quartzes and biotites also in dacites. Andesites include the plagioclase phenocrysts that exhibit reverse and oscillatory zoning together with sieve texture. Major element chemistry indicate that volcanics are calc-alkaline in character and ranging from basic to acidic compositions. Variations of the major oxides and trace elements versus SiO_2 show that the fractional crystallization have been an effective way on the evolution of the volcanics. The results of trace element analyses suggest that Yenice volcanics were enriched in LIL relatively to HFS elements. The negative Nb and Ta anomalies observed in multi-element patterns point to a subduction and/or crustal contamination process which is dominated on the genesis of parental magma. Ba/Nb ratios range 26-74 are typical values for subduction zone magmas. High values of LREE/HREE ratios are obtained from either enriched or low grade partially melted mantle source. All the indications obtained together for Yenice volcanics represent an evidence of the low grade partial melting of a metasomatised mantle source driven by a subduction process.

References:
Kurt, H., Asan, K., and Ruffet, G., 2008, The relationship between collision-related calcalkaline, and within-plate alkaline volcanism in the Karacadag Area (Konya-Türkiye, Central Anatolia): Chemie der Erde-Geochemistry, 68 155–176.