



Geochemistry and Sr-Nd-Pb isotopic characteristics of mantle xenoliths of Hacıköy and Karatepe alkaline lavas in Thrace Region (NW Turkey)

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Late Miocene basaltic lavas of Thrace region in NW Turkey contain abundant ultramafic xenoliths that provide important data about the never completely understood composition of the upper mantle. We present new major-trace element geochemistry and Sr-Nd-Pb isotope data from peridotite xenoliths within the alkaline basaltic rocks from Hacıköy and Karatepe basalts that crop out near the Tekirdağ and Çorlu in order to understand the origin of the Thrace basalts and nature of mantle beneath NW Turkey. The peridotite xenolith samples from those vary from spinel-harzburgite (70-80% olivine, 20-30% orthopyroxene, 5-10% spinel) to spinel-dunite (90% olivine, 5-10% spinel) due to the modal composition analysis.

The peridotite xenoliths have average MgO content of 42.43 wt. % and Al₂O₃ content of 1.15 wt. %. CaO content of the peridotite xenoliths show that they are strongly depleted (av. 1.22 wt. %). They are enriched in large ion lithophile elements (LREE) and depleted in HREE. Xenoliths are characterized by more uniform isotopic compositions compare to host basalts. Their measured average ⁸⁷Sr/⁸⁶Sr ratio is 0.703891, and ¹⁴³Nd/¹⁴⁴Nd value is 0.513160. The ²⁰⁶Pb/²⁰⁴Pb and ²⁰⁷Pb/²⁰⁴Pb values are 18.476 and 15.553 respectively.

These petrographical, geochemical and isotopic characteristics collectively indicate an enriched subcontinental lithospheric mantle beneath NW Anatolia. Our results are consistent with the Re-Os isotope results obtained from mantle xenoliths of the previous studies, concluding in a lithospheric mantle source. And this lithospheric mantle appear to have contributed to the Late Miocene alkaline volcanism as a result of crustal thinning associated with extension in NW Anatolia.