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Different Degrees of Partial Melting of the Enriched Mantle Source for Plio–Quaternary Basic Volcanism, Toprakkale (Osmaniye) Region, Southern Turkey

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**Abstract:** The Toprakkale (Osmaniye) region, located in the Yumurtalık fault zone in southern Turkey, contains Quaternary volcanic rocks, shown by their mineralogical and petrographical features to be alkali basaltic and basanitic. These alkaline rocks are enriched in the large ion lithophile elements (LILE) Ba, Th and U, and show light rare earth element (LREE) enrichment relative to heavy rare earth element (HREE) on primitive mantle trace and rare earth element patterns that indicate different partial melting of the same source. The isotopic  $^{87}\text{Sr}/^{86}\text{Sr}$  ratio is relatively low (0.703534-0.703575 for the alkali basalts and 0.703120-0.703130 for the basanites) and the  $^{143}\text{Nd}/^{144}\text{Nd}$  ratio is high (0.512868-0.512877 for the alkali basalts and 0.512885-0.512913 for the basanites), suggesting that both units originated from an isotopically depleted mantle source. The degree of partial melting of the Toprakkale volcanic unit was calculated using the dynamic melting method. The alkali basalts were formed by a high degree of partial melting (9.19%) whereas basanites were formed by a low degree of partial melting (4.58%) of the same mantle source. All the geochemical evidence suggests that the basic volcanism was generated by decompressional melting under a transtensional tectonic regime in the Yumurtalık fault zone, Southern Anatolia.

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