

Source implications for the different geochemical features of recent basaltic rocks from the northernmost part of the Cappadocian region, Turkey

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Extensive magmatic activities developed since middle-Miocene, in the Cappadocian Region of Central Anatolia in Turkey. The nature and the sources of the magmatism were well-constrained by previous studies. Even though the sources of Strato-volcanoes and monogenetic vents were briefly explained, extremely young basalts (1.22 – 0.094 Ka) situated in northernmost part of Cappadocian Region and erupted between the two extensional faults, are not deeply investigated.

Karaburna and Gülşehir lavas (1.22, 0.094 Ka, respectively, Dogan, 2011) are considered as a part of the Central Anatolian Volcanic Province, with extremely young ages, generated either at the final or after the final stage of the Cappadocian systems. These lavas have similar LIL and HFS elements patterns with each other, however, Karaburna samples are more enriched in HFS elements. These basalts also display approximately similar trends in LIL elements (except Rb) and reflect HFS depletion relative to the OIB signature, moreover, HFS are more enriched compared to the Hasandag basaltic rocks, all these features suggesting, basaltic rocks are originated from the modified mantle source.

Karaburna and Gülşehir basalts have low Nb/La (0.45-0.5 ; 0.35-0.42), Nb/Y (0.33-.39; 0.27-0.44 Nb/Th (2.75-4.6; 1.26-1.68) and high Ba/Nb (22-32; 38-43) ratios suggesting the contributions from the crustal sources, moreover, Gülşehir basaltic rocks differ from the Karaburna lavas with relatively low Nb/U (4.5-6.4) and high Ba/La (14.67-17.20) Th/La (0.22-0.27), whereas Karaburna samples are represented by low Ba/La (10.04-14.90) and Th/La (0.09-0.16) ratios, these geochemical features reveal that these differences are originated either from the different degrees of crustal involvement or change in the nature of the source in a short time interval.

Of all the most recent basaltic products generated in central Anatolia are alkaline in nature, besides, the trace element content, multi-element patterns and HFS/LIL and LIL/HFS element ratios, provide an appropriate information for the origin of the basaltic rock, the process that is responsible for the modified geochemical signature observed in Karaburna and Gülşehir basaltic rocks need to be investigated by further geochemical study particularly by melting models and also by Sr, Nd, Pb isotopes.