



The Origin and Petrogenesis of Mount Hasan (Small Mt. Hasan) and Keçiboyduran Stratovolcanoes

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Small Mt. Hasan (3069m) and Keçiboyduran (2727m) volcanoes are located within the Cappadocian Volcanic Field in Central Anatolia (Turkey). These Plio-Quaternary volcanoes are major stratovolcanoes of Cappadocian Volcanic Complex (CVC). In this study, we present petrography and major-trace element geochemistry of volcanic rocks of the Small Mt. Hasan and Keçiboyduran volcanoes.

Petrographic and geochemical investigation of the studied volcanic rocks indicate that Small Mt. Hasan volcano consists of compositions ranging from basaltic andesite to rhyolite and associated pyroclastic rocks, with a silica content ranging from 52.21 to 72.49 wt %. The volcanic rocks of Keçiboyduran volcano have rather uniform compositions including andesite and dacite lavas and related pyroclastic rocks and their SiO₂ content range from 61.14 to 63.25 wt%. Petrographical features of each volcano are similar and they display disequilibrium textures indicative of mixing/mingling processes, such as patchy zones and oscillatory zoning in plagioclase phenocrysts, synensis, sieved textured plagioclase, reaction rims in hornblende and biotite, rounded plagioclase phenocrysts with reaction rims. The volcanic rock series of Small Mt. Hasan and Keçiboyduran volcanoes are mainly calc-alkaline and present similar major-trace element characteristics. They show enrichment in large ion lithophile elements (LILE; Sr, K, Rb ve Ba) and depletion in high field strength elements (HFSE; Th, Ta, Nb ve Ce) with significant negative Nb, Ti, P and Y, suggesting a subduction signature and/or crustal contamination. Small Mt. Hasan and Keçiboyduran volcanic rocks display similar La/Nb values, 2.20-2.86 and 2.53-2.84 respectively. Both La/Nb values and partial melting models of volcanic rocks indicate (6-15%) spinel lherzolite as possible source mineralogy. The origin of the Cappadocian volcanism was possibly related to melting of a subduction-modified lithospheric mantle source, during the post collisional extension in Central Anatolia (Turkey).

Keywords: Small Mt. Hasan, Keçiboyduran, Central Anatolia, Volcanism