

Geochemical and petrological characteristics of Deh Siahān high-K granitic rocks, southeast of Central Iran: data bearing on genesis

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The Oligocene-Miocene granitic rocks of Deh Siahān, part of Central Iranian volcanic belt, are intruded into Eocene volcano-sedimentary complex where their contact is marked by albite-epidote hornblende hornfels facies and granitic apophyses. The granitic rocks show enhanced LIL element abundances and low HFS/LIL ratios. Geochemical data, various trace element discriminant diagrams, enhanced Y/Nb and Ce/Nb ratios, and ocean ridge granite normalized multi-element diagrams indicate that the Deh Siahān granitic rocks have characteristics of high-K, calc-alkaline, I-Cordilleran type granites of volcanic-arc settings. In this aspect, it represents part of an Andean-type magmatic arc formed in response to subduction of Neo-Tethys oceanic crust beneath Central Iran.

The partial melting of subducted oceanic crust led to the formation of basic magmas. Its emplacement under the mantle wedge provoked melting in the considerably metasomatized and enriched sub-continental lithosphere. This caused generation of siliceous magmas which eventually differentiated and formed the Deh Siahān granitic rocks. However, another possibility that also should be considered is the melting of mafic to intermediate, transitional to high-K calc-alkaline, metaigneous rocks in the crust, as a consequences of decompression following crustal thickening.