

Geochemistry of granitoids of the Lalezar area (Kerman, Iran)

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The Lalezar granitoids crop out within the Urumiyeh-Dokhtar Volcanic Belt (U-DVB) which is the largest volcanic belt in Central Iran. These granitoids intrude Eocene volcano-sedimentary rocks and range from gabbrodiorites to granites, with dominance of diorites and tonalites. The mineral composition of the most felsic rocks is characterized by the abundance of Na-plagioclase, quartz, alkali feldspar and biotite (and hornblende, in granodiorites and tonalites). In dioritic and gabbroic rocks, plagioclase (Ca-rich, in the most mafic lithologies), hornblende, biotite and clinopyroxene are the most common minerals, sometimes accompanied by orthopyroxene. Two kind of enclaves have been identified within the intrusive rocks: some display the same features of the andesitic country volcanic rocks, and therefore, are interpreted as xenoliths; others have mineral assemblages similar to those of the enclosing granitoid but with larger proportions of mafic minerals, which suggests that they can represent disrupted portions of sectors of the magma chamber where preferential settling of heavy minerals took place. Major element geochemical data show that the Lalezar granitoids are mostly metaluminous, although the most felsic members (granites) attain slightly peraluminous compositions, with A/CNK varying from 0.85 to 1.03. Harker diagrams show, in general, good linear correlations that agree with a genetic relationship between the different granitoids, through fractional crystallization of plagioclase, pyroxene, amphibole, oxide minerals and apatite. In primitive mantle-normalized trace element spiderdiagrams, the analysed samples display strong enrichment in LILE compared to HFSE ($15.78 \leq Rb_N/Y_N \leq 81.96$), accompanied by negative anomalies of Nb, Ta and Ti. REE chondrite-normalized plots show moderate LREE enrichment ($3.32 \leq La_N/Lu_N \leq 6.36$) and slight to strong negative Eu anomalies ($0.46 \leq Eu/Eu^* \leq 0.92$). In conclusion, the petrographical and geochemical features show that the Lalezar intrusives fit into I-type granitoids, belong to the calc-alkaline series and probably have been generated in a continental arc setting, which agrees with models previously presented to the U-DVB.

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