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Geochemistry and tectonic setting of the Astaneh granitoid, Sanandaj-Sirjan Zone, Western Iran

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The middle Jurassic Astaneh granitoid belongs to the northern part of structural Sanandaj-Sirjan Zone, which covering an area of 35 km^2. The main rock unit is present in the Astaneh granitoid dominated by granodiorite with a less common quartz – mozogranite and monzogranite. Minor fine grained granodioritic stocks, dykes and mineralized veins are observed in places. The rocks are made of quartz, plagioclase, alkali feldspar, biotite, and rare green amphibole. Zircon, apatite, allanite, sphene and opaques are common accessories and sericite, chlorite, calcite, epidote and sometimes tourmaline are secondary minerals. Harker diagrams of the major and trace elements display near-linear to curvilinear trends of decreasing Al_2O_3, TiO_2, Fe_2O_3, MgO, MnO, CaO and $P_2O_5$and increasing K_2O, whereas Na_2O scattered, with increasing SiO_2contents. Ni, Cr, Co and V display a pronounced negative correlation with silica contents. The Sr and Zn variations show a negative trend, whereas Rb, U, Ta, Nb and Th define a positive correlation and Hf, Yb, Y, Nd, Ga, Ce and La are scattered in comparison with the other elements. Geochemically this massif is metaluminous to slightly peraluminous, typical of I-type granites. The S-type affinity shown by some evidences may also represent local assimilation and contamination with country rocks. The Astaneh granitoide belongs to medium-K calk-alkaline series and displays geochemical characteristics typical of volcanic arc granites related to an active continental margin (e.g. a significant Nb, Ti, P and Sr depletion). This conclusion is in good agreement with a general model which assumed that the Sanandaj-Sirjan calc-alkaline magmatic arc formed over a high angle subducting oceanic slab in the Neotethyan subduction zone during Late Triassic to Late Cretaceous time.