

Mineral chemistry, thermobarometry, petrogenesis and tectonic setting of the Nokeh intrusion in the northern Semnan (Central Iran)

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Abstract: The Nokeh intrusion exposed in the northern Semnan area. The intrusion is composed of monzonite-quartz monzonite and granite-granodiorite and was intruded in the Eocene carbonaceous tuffs, where the country rocks converted to magnetite-skar. Plagioclase, orthoclase, quartz, biotite, amphibole and clinopyroxene are the constituent minerals of Nokeh intrusion. The study rocks represent granular, granophiric and mirmekitic textures. The Nokeh intrusion is metaluminous to peraluminous, calc-alkaline, I-type and belongs to subalkaline magmatic series. Based on EMPA data, clinopyroxenes, amphiboles, biotites and plagioclases are diopside, edenite, Mg-biotite and oligoclase to labradorite in compositions and formed in temperatures ranged from 1110 to 1160, 700, more than 800 and less than 700 °C respectively. Clinopyroxene, amphibole and biotite calc-alkaline affinity, low Ti and Ca-Si enrichment in the clinopyroxene composition and amphibole formation in a high-fugacity environment, confirm that Nokeh intrusion formed in a magmatic arc of active continental margin. On the basis of tectonic discrimination diagrams, the investigated samples fall into volcanic arc domain resulted in subduction of Neothetian oceanic lithosphere beneath Central Iran block.

Keywords: *Granitoid; mineral chemistry; thermobarometry; metaluminous; I-type; volcanic arc; Nokeh; Semnan.*

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