

Biotite and feldspar chemistry: An approach to the petrogenesis of the Gapdan pluton (NW of Zahedan)

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Abstract: The 43Ma Gapdan granitoid pluton is a part of Zahedan-Saravan granitoid belt and is located about 50 km NW of Zahedan. The pluton is mainly composed of biotite granite and granodiorite in composition and consists of quartz, plagioclase, K-feldspar, biotite, Fe-Ti oxides, zircon, apatite, and allanite. The granitoid rocks are mainly granular in texture, although they display poikilitic, perthite and myrmekite textures. The present paper aims to determine nature, the physico-chemical of crystallization and tectonic setting of the pluton based on mineral chemistries of biotite and feldspar. The biotite chemistry represents that the pluton is I-type and calc-alkaline which formed in an active continental margin. Biotite thermo-barometry presents that the mineral has been crystalized at 850 °C and 2-5 kbar, while two-feldspar thermometry shows temperatures of 555-734 °C which is a subsolidus re-equilibrium temperature of elements for Gapdan granitoid rocks. The pluton hosted lots of sedimentary and igneous enclaves, suggesting the parent magma was contaminated with country rocks during ascending and emplacement.

Keywords: *Mineral chemistry; biotite granite; granodiorite; Gapdan; Zahedan.*

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