Mineral chemistry using for evaluation of the Esmaeilabad granite generation in the Posht-e-Badam area (Central- East Iranian Microcontinent)

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Abstract: The Esmaeilabad granitic body with the Late Triassic age is situated in the central part of the Posht-e-Badam block (Central- East Iranian Microcontinent), in the northeastern of the Yazd Province. This granitic body cross cut the metamorphic rocks of the Posht-e-Badam complex and covered by the Cretaceous limestone. Rock forming minerals of the studied granites are K-feldspar (orthoclase), plagioclase (andesine, oligoclase), quartz, amphibole (magnesio-hornblende), biotite, apatite, titanite and zircon. According to the mineral chemistry analyses, amphiboles represent the igneous nature. Biotites are rich in Magnesium. Chemical characteristics of biotites indicate that they are primary biotites which are generated by calc-alkaline magma. Chemical composition of the amphiboles and biotites in the Esmaeilabad granites suggest that they belong to the I-type granites and generate in an environment with high fO₂. Geothermobarometry estimations yield temperatures between 550 to 700 °C and pressures in the range of 2 to 3.8 kbar. Based on the geological position and age of the studied rocks, generation of this granitic body can be related to the subduction and closure of the Paleo-Tethys Ocean in the western part of the Central- East Iranian Microcontinent, which can be the reason for granitic plutonism in this area.

Keywords: Mineral chemistry; geothermobarometry; granite; Esmaeilabad; Posht-e-Badam; Paleo-Tethys; Central- East Iranian Microcontinent.