

Petrigraphy, mineral chemistry, geochemistry and tectonic setting of Tertiary volcanic rocks in Shoushk area (east of Sarbisheh), Southern Khorasan

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Abstract: Tertiary volcanic rocks including andesite, trachydacite and rhyodacite with pyroclastic rocks cropped out in east of Sarbisheh at Southern Khorasan. The main minerals in andesites are plagioclase, pyroxene, amphibole and biotite and for acidic rocks include plagioclase, quartz, sanidine, amphibole and biotite. On the basis of microprobe analyses, the composition of plagioclases in andesites ranges from $Ab_{62.7}, An_{30.2}$ to $Ab_{35.5}, An_{62.9}$ and are andesine to labradorite. Pyroxenes are enstatite and have compositional range of $En_{50.6-57.8}, Fs_{39.8-47}$. Orthopyroxene thermometry represents temperature of 1050 to 1100°C with pressures of 1 to 10 Kbar. The studied rocks have medium to high-K calc-alkaline and shoshonitic nature. Geochemical characteristics, such as enrichment in LILE, depletion of HFSE and $Zr/Y > 3$, indicate magma relation to subduction zone and active continental margin. Relatively low values of $(La/Yb)_N (7.17-11.68)$ and $Dy/Yb (< 2)$ in Shoushk lavas, indicated that partial melting of mantle took place in the spinel-garnet transition zone.

Keywords: *Andesite; mineral chemistry; thermometry; calc-alkaline; active continental margin; Sarbisheh.*

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