

PT and fO_2 estimation of Tazehkand, Kalaybar gabbro-pyroxenites; Mineral chemistry and activity

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Abstract: In the mafic-ultramafic suite of Tazehkand, Kalaybar-NW Iran, of Early-Cenozoic age, pyroxenitic core is surrounded by gabbro and total complex is surrounded by Paleocene volcano clastic of Majid Abad Formation. The pyroxenite is composed chiefly of Cpx+Ol+Ore. The associated gabbro minerals consist of Pl + Cpx + Am + Phl. The pyroxene composition in the two rock types is diopside-rich and ranges between hedenbergite to Ca-tschermak. Plagioclase is anorthitic type and opaque mineral is mostly hematite. Some results of this investigation on the relationship between major phases activity and mineral chemical composition in these rocks are: Ca-tschermak activity in the pyroxenes is controlled with Al-content in T-site, Tschermakite activity in amphiboles has direct relation with ^(IV)Al, but reverse relations with ^(IV)Si, ^(VI)Al and ^(A)Na. Using several thermobarometric methods, temperature of 900 °C for pyroxenites and pressure of 7-9 kbar on the same temperature for gabbro crystallization, are estimated. The temperature of observed ilmenite lamellae exsolution from hematite matrix during sub-solidus phenomena is detected about 470 °C. Calculated Log fO_2 for the source magma is -8 to -14. This quantity is higher for pyroxenites than gabbros.

Keywords: *pyroxenite, thermobarometry, mineral activity, hematite-ilmenite exsolution, oxygen fugacity.*

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