

## Mineral chemistry and P-T estimation of formation of cummingtonite and coexisting minerals in the calc-silicate rocks from the Takht-e-Soleyman area, NW Iran

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(Received: 20/5/2007, in revised form: 22/12/2007)

**Abstract:** The calcareous rocks in the Takht-e-Soleyman area (NW Iran) crop out in association with a variety of metamorphic rocks including amphibolites, granitic gneisses, pelitic schists and meta-ultramafic rocks. Retrogressive metamorphism of these rocks occurred during decompressional cooling during exhumation. Cummingtonite-bearing rocks resulted from retrogression of the calc-silicates in the area. Their dominant mineral assemblage is plagioclase + garnet + calcic - amphibole + ferromagnesian - amphibole + quartz + calcite ± titanite ± epidote. Calcic - and ferromagnesian - amphiboles were determined by petrographical observations and EMPA analysis. Hornblende and cummingtonite compositions dominate the analysed amphiboles. Formation of Ca-poor cummingtonite coexisting with calcite and calcic - hornblende in the retrograde calc - silicates of the Takht-e-Soleyman area is a rare petrological occurrence. Thermometric estimates using mineral compositions of cummingtonite co-existing with hornblende is in the range of 550 - 600 °C. Al in hornblende barometry yields a pressure of  $6.5 \pm 0.6$  kbar, corresponding to medium pressure amphibolite facies.

**Keywords:** *Takht-e-Soleyman area, retrograde metamorphism, calc-silicates, cummingtonite, P-T conditions.*