

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

R. Hajialioghli¹, M. Moazzen¹, A. Jahangiri¹, G.T.R. Droop², R. Bousquet³

1- Department of Geology, University of Tabriz, Tabriz, Iran

2- School of Earth, Atmospheric and Environmental Sciences, University of Manchester, Oxford Road, Manchester, M13 9PL, UK

*3- Institut für Geowissenschaften, Universität Potsdam, Postfach 601553, D-14415 Potsdam, Germany
Email: r_hajialioghli@yahoo.co.uk*

(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 ± 0.6 kbar, corresponding to medium pressure amphibolite facies.

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