

DECOMPRESSIONAL P-T PATH IN THE ALBITE-STABILITY FIELD OF ORTHOGNEISS FROM THE UHP UNIT OF THE DORA-MAIRA MASSIF

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In order to constrain the low-P portion of the decompressional P-T path of the UHP Brossasco-Isasca Unit (BIU) (Dora-Maira Massif), a Grt-bearing phengite orthogneiss has been examined. The orthogneiss, derived from the Alpine deformation and recrystallization of a Variscan granite, consists of Qtz, Ab, Ep, Phe, Grt and Bt. Phengite flakes with Si = 3.52 - 3.45 a.p.f.u. are partially replaced by smaller, less celadonic phengite (Si from 3.38 to 3.20 a.p.f.u.). Garnet occurs as small idiomorphs, with average composition Grs₅₉Alm₃₇Sps₄. These mineral compositions are representative of those formed in Ab-bearing BIU orthogneisses (CHOPIN et al., 1991).

A P-T pseudosection in the MnNCKFMASH model system was calculated at $a(\text{H}_2\text{O}) = 1.0, 0.75$ and 0.5 , using the software PERPLEX and the approach of CONNOLLY (1990) with the internally consistent thermodynamic data set of HOLLAND & POWELL (1998, upgrade 2002).

Comparing measured compositions of the Grt-Phe-Bt assemblage with those modeled in the P-T pseudosection, an equilibration T of 610 °C at P = 12 kbar has been obtained for $a(\text{H}_2\text{O}) = 0.5$. This estimate fits along the P-T paths previously proposed for the BIU (e.g. COMPAGNONI et al., 1995; CHOPIN & SCHERTL, 2000; HERMANN, 2003; GROppo et al., 2005). Specifically: i) the Si-rich phengite cores (Si = 3.52 - 3.50) formed in the Ab stability field, at ~14 kbar; ii) a decompression from ~14 kbar to 5 kbar, with a T decrease to ~500 °C, is suggested by variation of Si contents in Phe and topology of the pseudosection; iii) the low $a(\text{H}_2\text{O})$ obtained along this portion of the decompressional P-T path is in agreement with dehydration during exhumation as shown by PROYER (2003) in N(C)KFMASH metagranites.

These petrological data suggest that the BIU granite gneisses were thoroughly equilibrated under high-P amphibolite facies conditions along the decompressional P-T path.

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