Micropetrology of melt and fluid inclusions: evidence of incipient melting in presence of fluid in HT/LP metapelites

GISELA LEOZ MUNTE [1*], SILVIO FERRERO [2], JOAN RECHE ESTRADA [1], FRANCISCO MARTÍNEZ [1]

[1] Dept. Geology, Universitat Autonoma de Barcelona, 08193 Cerdanyola del Valles, Spain (*correspondence: gis.leoz@gmail.com; joan.reche@uab.cat; francisco.martinez@uab.cat)

[2] Institut für Geowissenschaften, Universität Potsdam, 14476 Potsdam, Germany (sferrero@geo.uni-potsdam.de)

HT/LP metapelites found in the Osor Complex (Catalan Coastal Ranges, NE Iberia) records the prograde evolution of the unit related to a Variscan magmatic pulse. This resulted in high-T fluid flow, hydrous melting and production of trondhjemitic to granodioritic leucosomes [1] . The PT path followed by the metapelites during this heating episode shows an increasing T and P, reaching peak conditions in the sillimanite zone at 650-750 ºC and 5.5 kbar, leading to an incipient localized anatexis.

Remnants of fluid and melt have been found as primary inclusions in clusters in peritectic garnets. Two different types of inclusions were identified and investigated via Raman analysis: fluid and polycrystalline inclusions. Fluid inclusions are generally isometric and show two phases. The vapour phase contains CO_2, CH_4, and N_2, and the liquid phase consists of H_2O. Polycrystalline inclusions mainly contain quartz, chlorite, OH-bearing phases ± accessory minerals (rutile, ilmenite, zircon) and can be considered nanogranitoids (NG). The coexistence of these two inclusion types in the same cluster suggests conditions of primary immiscibility between a water-rich COHN fluid and silicate melt during anatexis [2] thus constraining partial melting to have occurred under fluid-present conditions.

[1] Reche & Martínez (2002) Techtonophysics v.348, p.111-134. [2] Ferrero *et al.* (2016). Earth and Planetary Science Letters, 454, 121–131.