

Transient Feedbacks between fluid flow, metamorphic-metasomatic mineral changes, and deformation style (Osor LP/HT complex; Guillerries massif, Catalan Coastal Ranges, NE Spain)

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Data from a metapelitic, metatexitic sequence in the Osor Variscan LP/HT complex, Guillerries suggest interaction between fluid/melt infiltration, metamorphic-metasomatic evolution and strain style changes. The bulk of the sequence contains the micaceous porphyroclastic retrograde assemblage $bi - ms - pl \pm sil \pm g \pm q$ where g , sil and q can be characterized as relict-metastable phases. The peak upper amphibolite-lower granulite facies assemblage (mz U-Pb age: 327 ± 5 Ma from Martínez et al., 2016) preserved only in minor semi-pelitic layers is: $g - bi - sil - q \pm crd \pm pl$ where g grow as a $sin-D2$ peritectic phase resulting from incongruent melting producing $pl-q$ rich stromatic/centimetric subconcordant leucosomes. A near peak fluid flow episode is supported also by the presence of H_2O -rich fluid and carbonatitic fluid inclusions located near melt inclusions inside garnet or by local fibrolitization. $D3$, characterized by C' type shear bands is clearly visible in the micaceous part of the complex. The complex is intruded by a pre-syn $D3$ swarm of aplitic/pegmatitic S-type laminar leucogranite dikes (305 ± 1.9 Ma. Martínez et al., 2008, 2016) and all data point to an alkali-type metasomatic event related to increased magmatic component in fluids as main factor of increasing blastesis of micas in an increasing K-rich bulk composition. As responsible for major changes in mineralogy, this alkali-metasomatism could have produced changes in rock rheology properties and thus in deformation style, triggering increasing exhumation velocities of the complex via nucleation and development of the $D3$ shear bands.

Martínez, F.J., Reche, J. and Iriondo, A., (2008). U-Pb Shrimp RG zircon ages of Variscan igneous rocks from the Guillerries massif (NE Iberia pre-Mesozoic basement). Geological Implications. *C.R. Geoscience* 340, 223-232.

Martínez, F.J., Dietsch, C., Aleinikoff, J., Cirés, J., Arboleya, M.L., Reche, J., Gómez-Gras, D., (2016). Provenance, age, and tectonic evolution of Variscan flysh, southeastern France and northeastern Spain, based on zircon geochronology. *Geological Society of America Bulletin*, 128 (5-6), 842-859.