

## Two Variscan magmatic events in HT/LP g bt sil semipelitic gneisses (Guilleries massif, Catalan Coastal Ranges, NE Iberia)

Joan Reche (1), Francisco J. Martínez (1), Jordi Cirés (2), and John Aleinikoff (3)

(1) Universitat Autònoma de Barcelona, Facultat de Ciències, Geologia, Spain, (2) Institut Cartogràfic i Geològic de Catalunya, Parc de Montjuïc, 080393 Barcelona, Spain, (3) U.S. Geological Survey, MS 963, Denver, Colorado 80225, USA

The Osor complex in the Guilleries massif (Catalan Coastal Ranges-CCR-,NE. Iberia) is a HT/LP Variscan metamorphic domain, where no evidences are found of previous high P episodes (Durán, H., 1985). Thus, the anomalous Variscan geotherm is thought to be generated during heating of a moderately thickened crust. Peak T of near  $700\pm 50^\circ\text{C}$  occurs due to anomalous heat flow at  $6\pm 0.5$  kbar and are recorded by an alternance of q-rich semi-pelitic gneisses. These rocks are Ca and alkali poor and Fe rich ( $FM \approx 0.8$ ) and contain the equilibrium assemblage g-bi-sil-crd-pl-q. Inclusions of st and hercinitic sp are found inside g, pl and bi. Garnets are big cm-sized porphyroblasts with a dominant sieve-like texture. In most samples g has a rotational/helicitic texture and is always found in the q-pl rich part of the matrix. A dominant foliation defined mainly by bi and fibrolitic sil (in places both reacted out to mimetic crd) wraps around the g porphyroblasts. Garnet shows cores that are inclusion rich (ilm, q) and subhedral rims almost devoid of inclusions. The q-pl rich domains are preferentially found located around g and on its pressure shadows but also homogeneously distributed as little matrix lenses or in bigger lenticular domains. In all cases the leucosomes are also wrapped by the dominant foliation (a previous foliation is deduced by opaque-q alignments inside g). The subhedral morphology of pl grains suggest that g-bearing, q-pl rich leucosomatic domains represent more or less modified pl-rich (trondhjemitic like)melt lenses having peritectic g generated during the main deformation episode. Relict st is found inside g at diverse crystal depth levels as well as inside pl and bi in the matrix. A Theriak-Domino (de Capitani & Petrakakis, 2010) model pseudosection suggest that a previous g st bi sil pl assemblage was de-stabilized during T increase ( $\approx 600$  to  $750^\circ\text{C}$ ) at around 6 kbar to a g-pl-q-bi-liq giving the pl-rich (ksp-devoid) melts. In addition, leucogranitic, ksp-bearing veins, are found as injections that sometimes clearly crosscut the foliation. SHRIMP U-Pb zircon ages for the leucogranites where found to be between  $299.0\pm 2.3$  Ma and  $305.3\pm 1.9$  Ma (Martínez, et. al., 2008). Otherwise nine SHRIMP U-Pb monazite age determinations in the semipelitic gneisses (Martínez et. al., 2016) have yielded three age groups (360 Ma,  $320\pm 5$  Ma and  $305\pm 6$  Ma) for both mz included in g or matrix mz. Besides the older 360 Ma episode for which explanation has not been still found, there is also the need to stablish if the q-pl melting episode corresponds to the  $320\pm 5$  Ma. age clustering in mz. If so, nearly 20 Ma. separate this heating episode from a new heating by leucogranites at around 300 Ma. If middle crust simply cooled or cooled and exhumed between the two heating episodes needs also to be firmly stablished.

de Capitani C. and Petrakakis K. (2010): The computation of equilibrium assemblage diagrams with Theriak/Domino software. *American Mineralogist* 95:1006-1016.

Durán, H., 1985, El Paleozoico de les Guilleries [Ph.D. thesis]: Barcelona, Spain, Universitat Autònoma de Barcelona, 243 p.

Martínez, F.J., Dietsch, C., Aleinikoff, J., Cirés J., M.L. Arboleya, M.L., Reche, J., and Gómez-Gras, D., (2016). Provenance, age, and tectonic evolution of Variscan flysch, southeastern France and northeastern Spain, based on zircon geochronology. *Geological Society of America Bulletin*, v. 128;no.5/6;p.842-859.

Martínez, F.J., Reche, J., and Iriondo, A., (2008). SHRIMP-RG zircon ages of Variscan igneous rocks from the Guilleries massif (NE Iberia pre-Mesozoic basement): Geological implications: *Comptes Rendus Geoscience*, v. 340, p. 223–232.