
Imprints of the Cretaceous Pyrenean rifting in the Agly Variscan basement (Eastern Pyrenees, France): a petro-structural and geochronological study

Valérie Bosse^{*1}, Cyril Aumar , Olivier Merle , and Patrick Monié

¹Université Clermont Auvergne – Université Clermont Auvergne, Laboratoire Magmas et Volcans, Campus universitaire des Cezeaux, 6 avenue Blaise Pascal, 63170 Aubière ,France. – France

Résumé

A petro-structural and geochronological (U-Th/Pb and ⁴⁰Ar-³⁹Ar) study has been conducted in the Agly Variscan Massif located in the Northern Pyrenean Zone (France). The Lower Gneiss Unit (LGU) displays highly ductile deformation with a NNE-SSW oriented stretching lineation and opposite senses of shear in the directions top-to-the-NNE and top-to-the-SSW. Field observations and thin section analysis show that these two senses of shear are coeval with bulk coaxial vertical shortening and horizontal lengthening. Focusing on syntectonic minerals located within shear bands, Th-U/Pb monazite and ⁴⁰Ar/³⁹Ar mica dating yield a 94–127 Ma age bracket for the mylonitic deformation. The principal conclusion from these results is that the main ductile strain (i.e., stretching lineations and kinematic indicators) in the LGU should be ascribed to the Cretaceous rifting. A PTt path for the LGU is proposed showing the diachronism between the Cretaceous metamorphic evolution in the Agly Massif (peak temperature at 127 Ma) and the sedimentary basins (peak temperature at 95 Ma) bordering it to the north and south. Finally, a north-south crustal scale evolution of the whole area is put forward to explain this diachronism.

Mots-Clés: Agly Variscan Massif, Pyrenean Rift, Cretaceous, U, Th/Pb and ⁴⁰Ar, ³⁹Ar petrochronology

^{*}Intervenant