



New age constraints on the Permian magmatism in the Sallent area (Axial Zone, central Pyrenees)

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This contribution presents the first U-Pb SHRIMP age determinations on zircons from the mafic dyke swarm intruding Devonian slates and limestones from the Sallent area, in the Axial Zone of the Central Pyrenees. The dated sample is a dolerite with intergranular texture made of euhedral to subhedral phenocrysts of plagioclase and interstitial pyroxene. More than 75 % of primary labradorite was replaced by albite and primary augite is almost chloritized. On Zr/TiO₂ vs. SiO₂, Zr/P₂O₅ vs TiO₂ and Zr/TiO₂ vs Nb/Y diagrams (Winchester and Floyd, 1977) samples plot on the "alkaline basalt" field. High Ti/V > 50 values (Shervais, 1982) also agree with their alkaline nature.

Zircons were extracted from 30 kg of the selected sample. Only few zircons were obtained, since the crystallization of this mineral is usually prevented in basalts due to very fast cooling. Zircon grains were analyzed on a SHRIMP-II SIMS in the Centre of Isotopic Research at VSEGEI (Saint Petersburg). Analyzed zircons are large fragments (>200 μm) probably obtained after crushing larger euhedral crystals and they have oscillatory zoning. High ²³²Th/²³⁸U ratios (0.59-1.00) common in zircon from basic igneous rocks, have been observed. In order to date the intrusion age five analyses were made in the central areas of these zircons. All analyses define a Concordia age of 259.2 ± 3.2 Ma (2σ - MSWD 2.1).

The Devonian rocks of the Sallent area are discordantly covered by Carboniferous and Permian sedimentary sequences. A voluminous calc-alkaline volcanism with minor intrusive bodies, related to the opening of Stephanian-Permian troughs, is interlayered within Early Permian sediments. This volcanism has been commonly divided in three main episodes in the Sallent area (Bixel and Lucas, 1983; Ternet et al., 2004): The first one (Midi d'Ossau) produced peraluminous dacites and rhyolites at the base and high-K calc-alkaline andesites and dacites (with U-Pb ages between 278-272 Ma) and low-K calc-alkaline andesites at the top. The second episode (Anayet) is represented by transitional to alkaline andesites of imprecise age but a Late Autunian to Saxonian extrusion time is postulated based on the relative age of the country rocks. The last volcanic episode is formed by homogeneous alkaline basalt with unconstrained age yet.

The 259.2 ± 3.2 Ma age presented here allows us to consider that this type of dykes could represent the last pulse of the Permian magmatism in the Pyrenees, as it provides the youngest reported age for such magmatic event. The interpretation as late, vanished magmatic pulses is also consistent with the occurrence of the analyzed rock as dykes and sills at a deeper structural level than the older Permian volcanic materials that crop out extensively in the Anayet and Midi d'Ossau sectors. Finally, although it is beyond the scope of this work, the age and the geochemistry of the Sallent dyke seem to mark the transition to the new geodynamic setting prevailing in the Pyrenees during the Mesozoic, which was responsible for the generation of the Triassic "ophites" and the "Buntsandstein" facies.

Bixel, F., Lucas, C., 1983. *Revue de Géographie Physique et Géologie Dynamique*, 24, 329-342.

Ternet, Y. *et al.*, 2004. *Feuille Laruns-Somport (1069)*. BRGM.

Winchester, J.A., Floyd, P.A., 1977. *Chemical Geology*, 20, 325-343.

Shervais, J.W. 1982. *Earth and Planetary Science Letters*, 59, 101-118.