

# Characterisation and interlaboratory comparison of a new calcite reference material for U-Pb geochronology - The “AUG-B6” calcite-cemented hydraulic breccia

THOMAS BLAISE<sup>1</sup>, ROMAIN AUGIER<sup>2</sup>, DELPHINE BOSCH<sup>3</sup>, OLIVIER BRUGUIER<sup>4</sup>, NATHAN COGNÉ<sup>5</sup>, PIERRE DESCHAMPS<sup>6</sup>, ABEL GUIHOU<sup>7</sup>, FRÉDÉRIC HAURINE<sup>8</sup>, GUILHEM HOAREAU<sup>9</sup> AND JULIUS NOUET<sup>8</sup>

<sup>1</sup>Université Paris-Saclay, CNRS, GEOPS

<sup>2</sup>Université d'Orléans, Institut des Sciences de la Terre d'Orléans (ISTO)

<sup>3</sup>CNRS-UMR5243, Géosciences Montpellier, Université de Montpellier

<sup>4</sup>Géosciences Montpellier, Université de Montpellier, CNRS

<sup>5</sup>University of Rennes

<sup>6</sup>CEREGE, Aix Marseille Univ, CNRS, IRD, INRAE, Coll France

<sup>7</sup>Aix Marseille Univ, CNRS, IRD, INRAE, Coll France, CEREGE UMR 7330

<sup>8</sup>Université Paris-Saclay, CNRS, GEOPS

<sup>9</sup>Université de Pau et des Pays de l'Adour, E2S UPPA, CNRS, TOTAL, LFCR

Presenting Author: [thomas.blaise@universite-paris-saclay.fr](mailto:thomas.blaise@universite-paris-saclay.fr)

We present the mineralogical, geochemical and geochronological characterisation of the calcite-cemented hydraulic breccia "AUG-B6" and propose it as a reference material for calcite U-Pb geochronology.

The material consists of millimeter-sized, well-crystalized sparite crystals that formed rapidly and synchronously [1]. LA-ICP-MS mapping shows relatively high U content together with large variations in the U/Pb ratios. As a consequence, randomly localized laser ablation spot analyses (100 – 150 µm) lead to an ideal dispersion in a Tera-Wasserburg space, with spots reflecting different mixing proportions between radiogenic and common Pb endmembers, and very-well constrained isochrons with MSWD ~ 1.

An interlaboratory comparison conducted with various equipment for *in-situ* analyses (LA-Q-ICP-MS, LA-TQ-ICP-MS, LA-HR-ICP-MS) shows very consistent and reproducible ages, within analytical uncertainties, on various AUG-B6 sub-samples. We show that AUG-B6 can be used as a suitable reference material for *in-situ* calcite U-Pb geochronology to better estimate the long-term excess-variance and to improve the precision and accuracy of measured ages.

## Reference

[1] Pagel M., Bonifacie M., Schneider D.A., Gautheron C., Brigaud B., Calmels D., Cros A., Saint-Bezar B., Landrein P., Sutcliffe C., Davis D., Chaduteau C., 2018. Chemical Geology 481, 1-17, <https://doi.org/10.1016/j.chemgeo.2017.12.026>.