

# The 600 Ma-Old Pan-African Magmatism in the In Ouzzal Terrane (Tuareg Shield, Algeria): Witness of the Metacratonisation of a Rigid Block



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**Abstract** The high-level sub-circular North Tihimatine granitic pluton, intrusive in the In Ouzzal terrane, has been dated at  $600 \pm 5$  Ma (LA-ICP-MS U–Pb zircon) and at  $602 \pm 4$  Ma (SHRIMP U–Pb zircon). At this time, while Tihimatine intruded a brittle In Ouzzal without major metamorphism, large high-K calc-alkaline granitoid batholiths emplaced in the adjacent terranes under ductile conditions and regional amphibolite facies metamorphism. Outside In Ouzzal, high-level plutons emplaced under brittle conditions are known only at c. 580 Ma. The In Ouzzal terrane (500 km  $\times$  80 to 5 km), made of c. 2 Ga very high-temperature granulitic lithologies with Archean protoliths, is the sole terrane within the Tuareg Shield to have been largely unaffected by the Pan-African orogeny. The field, petrographic, geochemical and isotopic characteristics of the In Ouzzal granitic plutons studied herein, give keys for the understanding of the atypical behavior of the In Ouzzal terrane. The In Ouzzal Pan-African granitoids present chemical compositions varying from medium-K to high-K calc-alkaline to alkaline compositions. This is recorded by the Sr and Nd radiogenic isotopes

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