

Zircon U-Pb geochronology, geochemistry and Sr-Nd isotopes of the post-collisional A type-granites from the Zenaga, Kerdous and Bas- Drâa inliers (western Anti-Atlas, Morocco)

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In the Southwestern domain of the Moroccan Anti-Atlas belt, three distinct late Ediacaran granites have been investigated: the Sidi El Houssein ring, Taфраout pluton and Taourgha batholith located, respectively, in Zenaga, Kerdous, Bas Drâa inliers. U-Pb zircon data obtained by SIMS yield the following ages: 584 ± 2.29 Ma/ 579 ± 3.83 Ma for Sidi El Houssein granite (Zenaga Inlier), 581 ± 2.05 Ma of Taфраout granites (Kerdous inlier) and 588 ± 2.67 Ma for the Taourgha intrusion (Bas-Drâa inlier). Geochemically, these pink granites display high SiO₂ contents that range from 69.19 to 77.3 wt. %. They are mainly peraluminous to weak metaluminous and high-K calc-alkaline with LILE (Rb, K, Th) and HFSE (Ta, Zr, Hf) enrichment, with depletions in Ba, Nb, Sr, and Ti. These rocks have relatively high zircon saturation temperatures (700–900°C), high Zr + Nb + Ce + Y contents >350 ppm, and $10,000 \times \text{Ga/Al}$ ratios > 2.6 that are typical of A-type granites. Isotopic compositions show that the granitoids have variable (⁸⁷Sr/⁸⁶Sr)_i ratios (0.67–0.73), εNd(t) values (-2.9 to -7.63) and T_{DM} model ages of 1.49 to 2.53 Ga, suggesting that they were derived from the partial melting of a continental crust with moderate mantellic contribution. These granitic intrusions are subcontemporaneous to the widespread volcanic and volcano-detrital rocks from Ouarzazate Group (580–545 Ma), marking the post-collisional transtensional period in the Anti-Atlas. All these data provide evidence of an emplacement of these late Neoproterozoic granitoids during a transtensional regime due to an asthenosphere upwelling that follows the lithospheric delamination related to the collapse of the Panafrican belts.