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Insights on the crustal evolution of the West African Craton from combined U-Pb ages and Hf isotopes in detrital zircons from the Anti-Atlas belt

J. Abati (1,2), A.M. Aghzer (3), A. Gerdes (4,5), and N. Ennih (3)

(1) Universidad Complutense de Madrid, Petrología y Geoquímica / Facultad de Geología, Madrid, Spain (abati@geo.ucm.es), (2) Instituto de Geociencias, Consejo Superior de Investigaciones Científicas, 28040 Madrid, Spain, (3) Departament Géologie, Faculte des Sciences, Université Chouaib Doukkali, El Jadida, Morocco , (4) Institut für Geowissenschaften, Mineralogie, Goethe-University Frankfurt (GUF), Altenhöferallee 1, D-60438 Frankfurt am Main, Germany, (5) Department of Earth Sciences, Stellenbosch University, Private Bag X1, Matieland 7602, South Africa

U-Pb dating combined with Lu-Hf isotopic composition of detrital zircons of the Anti-Atlas belt in Morocco have been used to refine the lithostratigraphy and investigate the crustal evolution of the northern part of the West African Craton (WAC). The zircons were separated from six samples of siliciclastic sedimentary rocks from the main Neoproterozoic stratigraphic units of the Anti-Atlas belt, from the Sirwa and Zenaga inliers. The data suggest that the north part of the WAC formed during three cycles of juvenile crust formation with variable amount of reworking of older crust. The younger group of zircons, with a main population clustering around 610 Ma, has a predominant juvenile character and evidences of moderate mixing with Paleoproterozoic and Neoarchean crust, which supports that most igneous and metamorphic rocks where zircons originally crystallized were formed in an ensialic magmatic arc environment. The group of zircons in the age range 1.79-2.3 Ga corresponds to the major crust forming event in the WAC: the Eburnian orogeny. The isotopic data indicate that the provenance area should represent a crustal domain that was separated from a mantle reservoir at ∼2050 – 2300 Ma, and further evolved with a time-integrated $^{176}Lu/^{177}Hf$ of ∼0.01, characteristic of continental crust. The evolution of the Eburnian orogeny is apparently dominated by new crust formation in a magmatic arc environment. The Lower Paleoproterozoic and Neoarchean evolution (2.3-2.75 Ga) includes a group of detrital zircon ages that has not been identified up to now in the igneous or metamorphic rocks of the north WAC basement. Their Hf isotopic signature points to reworking of mainly juvenile Neoarchean crust with some Meso- to Palaearchean contributions. The significance of these ages is uncertain: they can represent a tectonothermal event not discovered yet in the Reguibat Shield or the zircons can be far travelled from an unknown source.