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U-Th-Pb and Hf isotopic studies of zircon from the West Congo Belt of NW Angola and the adjacent igneous basement

Gärtner, A.[1], Toto Nienguesso, A.B.[2], Linnemann, U.[1], Hofmann, M.[1], Gerdes, A.[3], Marko, L.[3], Krause, R.[1], Lana, C.[4], Makenda, A.[5]

[1] Senckenberg Naturhistorische Sammlungen Dresden, Museum für Mineralogie und Geologie, Sektion Geochronologie, Königsbrücker Landstraße 159, 01109 Dresden, Germany; andreas.gaertner@senckenberg.de

[2] Albrutoni Angola Lda, Rua do Comercio, Edifício NCH n°7, Uíge, R. Angola; albrutoni_angolalda@outlook.de

[3] Institut für Geowissenschaften, Goethe Universität Frankfurt, Altenhoeferallee 1, 60438 Frankfurt, Germany

[4] Universidade Federal de Ouro Preto, Departamento de Geológia, Ouro Preto, Minas Gerais, Brasil, 35400000

[5] Ministerio de Geológia e Minas e da Industria, Instituto Geológico de Angola, C. Postal 1260-c, Luanda, Angola

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The Neoproterozoic West Congo Belt of northwestern Angola lies unconformably above an Eburnian basement with local occurrences of ca. 1000 Ma granites (Noqui type) and ca. 940 Ma granitoid veins [1, 2]. The belt itself is mainly equal to the West Congolian Group, which is subdivided into four subgroups that are from bottom to top: Sansikwa, Alto Shiloango, Schisto-Calcaire, and Mpioka. Among siliciclastic sediments of variable grain sizes and stromatolite-bearing limestones, some rare occurrences of mafic and felsic volcanics are present. At least two glacigenic diamictites can be found at the bases of the Alto Shiloango and the Schisto-Calcaire Subgroups that are attributed to the Sturtian and Marinoan glaciations. The West Congolian Group is covered by the Late Ediacaran to Early Cambrian Inkisi Subgroup, which mainly contains siliciclastic sediments.

Detrital zircon grains were obtained from sediments of the main stratigraphic units of the West Congolian Group and the overlying Inkisi Subgroup, whereas zircons from igneous basement rocks were collected from the Kwanza horst as well as the Central Eburnean Zone of western central Angola. New U-Th-Pb and Hf isotope data of these zircon grains reveal significantly changing sedimentary provenances and a polyphase magmatic record at the western margin of the Congo Craton. The main zircon age populations are at ca. 600 Ma, 900-1100 Ma, 1900-2100 Ma, and 2600-2800 Ma. This distribution pattern of zircon ages is in accordance to the already published data from the northern parts of the West Congo Belt [e.g. 1, 3], the recent Congo River [4, 5], and the newly obtained data from the Cuanza River that are thought to be representative for the western Congo Craton. However, some rocks, e.g. clasts from both of the glacigenic diamictites or pelites from the Sansikwa Subgroup, show main peaks at ages between 1200 and 1600, as well as around 1800 Ma. These age distributions are in clear contrast to the previously mentioned zircon age pattern of the western Congo Craton. Previously published Hf isotope data of zircon from the Congo Craton show large spreads of $\varepsilon Hf_{(t)}$ values around 600 Ma and between 900 to 1100 Ma [5, 6], which are thought to be related to crustal mixing. The newly obtained Hf data mostly corroborate this interpretation. Finally, some of the igneous rocks from the Eburnean basement that crop out at the southern limit of the West Congo Belt show high abundances of inherited zircon. In addition to the youngest zircon ages that confirm the Eburnean age of the basement, various age groups between 2350 and 2650 Ma were recognised. They may represent a sedimentary sequence that was intruded by the granitoids.

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