

Detrital zircon U-Pb geochronology of the Nancaode and Zhuanghegou Formations in the Mouzigou area of the S-OB, North China Block

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The south margin of Ordos basin (S-OB) is located at the west part of the South-sector of North China Block (S-NCB), involved in the multiple orogeny of the North Qinling Belt (NQB) that is composed of the S-NCB to the north and the north Qinling terrain (NQT) to the south. The pre-Ordovician tectonic correlation between the NQT and NCB has long been controversial. Here, detrital zircon U-Pb dating analysis of sandstone samples from the neritic-littoral deposits of the late Neoproterozoic Nancaode and Zhuanghegou Formations, outcropped in the Mouzigou area of the S-OB, are carried out at the State Key Lab. of Continental Dynamics, China. All the concordant zircons ($n=155$) from sampled sandstones show broadly similar age patterns with a wide range of 825~2445 Ma. The largest population exhibits ages of 1659~1935 Ma ($n=39$) with a peak at $1.86 \text{ Ga} \pm$; and the subordinate populations display ages of 2017~2445 Ma ($n=7$), 1458~1650 Ma ($n=24$), 1223~1451 Ma ($n=36$), 1041~1203 Ma ($n=23$) and 825~995 Ma ($n=13$) with the peaks of $2.09 \text{ Ga} \pm$, $1.59 \text{ Ga} \pm$, $1.33 \text{ Ga} \pm$, $1.12 \text{ Ga} \pm$ and $0.83 \text{ Ga} \pm$, respectively. It indicates that the detritus of the the 2-formation deposits were mainly sourced from the metamorphic basement rocks of the NCB and subordinately from the complex and igneous rocks of the NQT. Besides, almost every spectrum of the each sample is quite similar to that of the intercalated sandstone of the late Neoproterozoic (Sinian) tillites exposed in the S-OB, and there are 4 youngest zircon ages of $744 \pm 8 \text{ Ma}$, $825 \pm 17 \text{ Ma}$ and $829 \pm 11 \text{ Ma}$, suggesting the deposit time of the Nancaode and Zhuanghegou Formations to be no more than *ca.* 825 Ma. All of the above reveal that the NQT was amalgamated to the NCB during late Grenvillian period, and It can be therefore supported that the S-NCB amalgamated with the NQT as a whole experienced a extensional sedimentary process after *ca.* 0.825 Ga, corresponding to the Rodinia break-up event, and also indicating there was developed the Grenvillian collision to uplifting process in the S-NCB.