

**Sr, C and O isotope composition of
Hyangsanni Dolomite in
northeastern Okcheon Metamorphic
Belt, South Korea: additional
constraints on Neoproterozoic
glaciation in the Sino-Korean Craton**

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There has long been controversy over the deposition times of the metasedimentary and metavolcanic sequences of the Okcheon metamorphic belt (OMB). However, the U-Pb zircon age determination allows a more detailed understanding. The Seochangni Formation, composed mainly of pelitic rocks with alternating quartzose sandstones and calcareous units, is located at the most northeast of OMB and shows detrital zircon U-Pb ages from late Paleoproterozoic to the latest Mesoproterozoic. A limestone of this formation shows an $^{87}\text{Sr}/^{86}\text{Sr}$ ratio of 0.70587, suggesting its deposition at ca. 850 Ma. The Buknori Formation in the west is composed of diamictite, showing detrital zircon age distributions similar to Seochangni Formation. The Hwanggangni Formation is also composed of diamictite, and the detrital zircon age varies from region to region. Adjacent to Buknori Formation, the Mesoproterozoic component is pronounced, but at distances, it is dominated by ca. 750 Ma and 1870 Ma, indicating its deposition after ca. 750 Ma. The Sr, C and O isotopic compositions were analyzed from Hyangsanni Dolomite, which is further west than Hwanggangni Formation. Samples yield comparatively consistent $\delta^{13}\text{C}$ (PDB) values (5-6‰) and $\delta^{18}\text{O}$ (SMOW) values (21-24 ‰). They also yield minimum initial $^{87}\text{Sr}/^{86}\text{Sr}$ ratios between 0.7071 and 0.7115. Assuming that the lowest Sr isotope value is the seawater value at that time, this value corresponds to a time of about 710-640 Ma. Considering the consistently high carbon isotopic values of about 5‰, we suggest that the depositions of Hyangsanni Dolomite and adjacent Hwanggangni diamictite were related to glaciation of about 710 Ma. The occurrence of the Neoproterozoic glacial deposit and the zircon age distribution characteristics of the northeast OMB are very similar to the southwest region of North Korea and the southern margin of North China Craton, suggesting that these areas have evolved into a single mass since Early Neoproterozoic.