

**LA-ICP-MS U-Pb Zircon ages
and C-O isotope geochemistry
of the Fenzishan Magnesite,
North China Craton:
implications for the Great
Oxidation Event and ore genesis**

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The Great Oxidation Event (GOE) throughout overprinted by the early Paleoproterozoic metallogenic explosion in early Precambrian cratons, such as North China Craton (NCC). The greenschist-amphibolite facies 2.24 – 1.9 Ga Fenzishan Group of the Jiao-Liao-Ji belt, NCC, hosts numerous ore deposits and includes, in ascending order, the 2.24 – 2.193Ga Xiaosong (BIFs, marble), Zhujiakuang (tourmaline, andalusite, kyanite), Zhanggezhuang (marble, magnetite, talc), Jutun (graphite, marble) and Gangyu formations. Here we report LA-ICP-MS U-Pb Zircon dating of hanging-wall rocks from the No. 6 (FZS12) and the No. 5 (FZS22) ore bodies of the Fenzishan magnesite ore and present C and O isotope analyses of 30 samples from the Zhanggezhuang Formation. A total of 164 magmatic source zircon grains were analysed to FZS11 and FZS22 and obtained 87 and 77 concordant ages, respectively. They show age peaks at ~2.35–2.5 Ga and ~2.55–2.6 Ga, with four grains having Paleoproterozoic ages (> 3.1Ga). The youngest concordant detrital zircon ²⁰⁷Pb/ ²⁰⁶Pb ages are 2113±53 Ma for FZS11 and 2042±33 Ma for FZS22, respectively. Moreover, 30 samples of carbonates yield δ¹³C and δ¹⁸O values of -2.0–3.4 ‰ and 9.2–20.2 ‰, with average values of 1.3±0.6 ‰ and 13.6±2.9 ‰, respectively. It shows a character of the 2.22 – 2.06 Ga Lomagundi Event (unique positive δ¹³C_{carb} excursion), which is a sub-event of the GOE.