

Diagenetic signals archived in calcitic glendonite of the Ediacaran Doushantuo Formation, South China

ZHOU WANG¹, JIASHENG WANG¹, SHUHAI XIAO²

¹ State Key Laboratory of Biogeology and Environmental Geology & College of Marine Science and Technology, China University of Geosciences, Wuhan 430074, PR China (Z. Wang: wungchou@qq.com; J. Wang: js-wang@cug.edu.cn)

²Department of Geosciences, Virginia Tech, Blacksburg, VA 24061, USA (S. Xiao: xiao@vt.edu)

Calcitic glendonites in the Ediacaran Doushantuo (DST) Formation are pseudomorphs of precursor ikaite, and preserve the diagenetic history of the DST Fm. We analysed C, O, Sr, and carbonate clumped isotope compositions (Δ_{47}) of DST glendonites from two drill cores. Sparry and blocky calcite in DST glendonites yielded variable and sometimes extremely negative $\delta^{13}\text{C}$ values, which are negatively correlated with $\delta^{18}\text{O}$ values. A thermal history with temperatures of 100–170°C is inferred from the Δ_{47} thermometry. The Δ_{47} -temperatures of DST glendonites are compatible with the upper limit of Δ_{47} -temperatures from the EN3 unit (Lloyd et al., 2015) that overlies the glendonite-bearing strata, which is characterized by the EP1 feature. DST glendonite may have been altered (e.g., recrystallization) during burial diagenesis. Sr isotopes of DST glendonite, particularly those of extremely ^{13}C -depleted samples, deviate from $^{87}\text{Sr}/^{86}\text{Sr}$ ratios of bulk dolostone of DST Member II (EP1) (Sawaki et al., 2010) that is correlated with the glendonite-bearing strata. This deviation is further evidence for diagenetic alteration of DST glendonite.