

Fluid electrolytes of Mohailaheng Pb-Zn deposit in Tibetan plateau

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The Mohailaheng deposit, located in the north eastern margin of Tibetan collisional orogen, is a MVT-like Pb-Zn deposit controlled by thrust nappe structures [1] in the 'Sanjiang' metallogenic belt. Ore bodies in this deposit are stratabound and hosted by Early Carboniferous limestone in the hanging wall of a Cenozoic thrust fault system. Five mineralization stages are recognized, including minerals such as sphalerite, galena, dolomite, barite, calcite and fluorite.

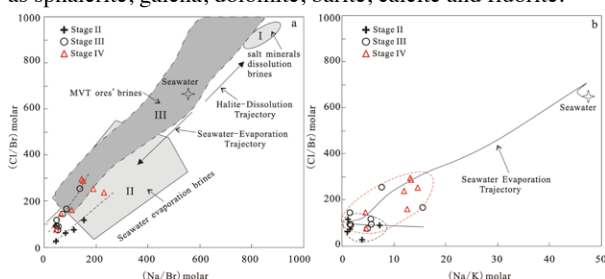


Fig.1 Binary plots of fluid inclusion electrolytes from the Mohailaheng deposit. (The field of I from [2], of II from [3], and of III from [4]. Seawater evaporation curves from [5].)

The solute compositions of ore-forming brines for the Mohailaheng deposit were measured from bulk extraction of fluid inclusions in barite, calcite and fluorite in different mineralization Stages. The Cl/Br and Na/Br molar of the solutes plot close to seawater evaporation line (Fig. 1a) and constrain the source of the ore-forming brine to evaporate seawater. Some Cl/Br and Na/K plot along but slightly above the seawater evaporation line (Fig. 1b) indicating seawater was evaporated beyond halite saturation. Some data in Fig. 1a plot in the compositional field for MVT basinal brines suggesting they all share a common origin. Other data out of MVT field in Fig. 1a may indicate other origins such as regional metamorphic fluid suggesting by microthermal work.

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[1] Hou *et al.*. (2008) *Mineral Deposits* 27, 420-441. [2] Heijlen *et al.*. (2001) *Miner Deposita* 36, 165-176. [3] Kesler *et al.*. (1996) *Geochim Cosmochim Acta* 60, 225-233. [4] Leach *et al.*. (2005) *Econ Geol* 100th Anniversary Volume, 561-607. [5] Fontes & Matray. (1993) *Chem Geol* 109, 149-175.

Boron isotopic composition in *Arctica islandica* shell: a potential historical, prehistorical and geological seawater pH indicator

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Research on the ocean carbon cycle is vitally important due to the projected impacts of atmospheric CO₂ on global temperatures and climate change, but also on ocean chemistry. The actual influence of this CO₂ rise on the pH of North Atlantic seawater is largely unknown because of the dearth of instrumental records or reliable proxies. The long-lived bivalve mollusk *A. islandica*, common in the shelf seas of the temperate to sub-polar North Atlantic, is an excellent high-resolution marine archive with great potential for monitoring pH as well as other seawater properties. Boron isotopic composition ($\delta^{11}\text{B}$) in aragonite biogenic carbonate has been suggested to trace ambient seawater pH because marine carbonates will primarily incorporate $\text{B}(\text{OH})_4^-$ into the carbonate structure during growth, in which the $\delta^{11}\text{B}$ is pH dependent. Here we aim to develop a $\delta^{11}\text{B}$ -pH transfer function in *A. islandica* to reconstruct mid to high latitude seawater pH record. An improved rapid throughput microsublimation technique coupled with Total Evaporation NTIMS method was conducted so that <1 ng boron could be measured. Reproducibility of boron isotopic composition of better than $\pm 0.3\text{‰}$ (2SE, $n > 10$) was achieved for a variety of isotopic standards and natural samples. We analyzed boron isotopic composition in the living shells reared at the Darling Marine Center, Maine, USA in which seawater temperature, salinity and pH were carefully monitored. During the experimental period (January 2010 to August 2010), the temperature raised from 2 to 18°C, with a 3 ppt salinity variation and a 0.2 pH unit change. Our pilot data suggest the the $\delta^{11}\text{B}$ value reflects the ambient seawater pH. This study will form the basis for reconstructing high-resolution seawater pH in the mid to high latitudes of the Atlantic Ocean through the living and fossil history of *A. islandica*.