Sulfur isotope data from Beaver Brook Antimony deposit, Central Newfoundland, Canada: A hint for the source of mineralization?

DIRK SANDMANN*, THOMAS SEIFERT AND JENS GUTZMER

Department of Mineralogy, TU Bergakademie Freiberg, Brennhausgasse 14, D-09596 Freiberg, Germany (*correspondence: dirk.sandmann@mineral.tu-freiberg.de, thomas.seifert@mineral.tu-freiberg.de, jens.gutzmer@mineral.tu-freiberg.de)

The Beaver Brook Mine exploits one of the largest antimony deposits in the Americas. It has a current production level of 12,000 metric tons antimony concentrate (grading around 65% Sb) per year with current reserves sufficient for an estimated ten-year operating life. The mineralization (dominantly stibnite with traces of pyrite as well as quartz and carbonate gangue) is hosted by meta-sedimentary rocks of Ordovician to Silurian age and structurally controlled by faults and breccia zones. The conditions of formation of the deposit remain unknown, but it has characteristics similar to other Sb-dominated hydrothermal deposits that form at variable temperatures (100-400°C).

Stable sulfur isotope data of ten monomineralic stibnite samples were analyzed at the Department of Mineralogy, TU Bergakademie Freiberg. $\delta^{34}S_{VCDT}$ values for the stibnite samples occupy a very narrow range from -6.6 to -6.0‰ with an total analytical error of ≤ ±0.3‰. The narrow range of $\delta^{34}S$ values of stibnites from Beaver Brook suggests stable physico-chemical conditions as well as a large well-mixed sulfur reservoir. Obolensky *et al.* [1] suggest that mixing of neutral or alkaline metal-containing solutions with H_2S-bearing fluids sourced from sulfide-rich host rocks are well-suited for stibnite ore deposition. Accordingly, we suggest that the sulfur contained in the Beaver Brook deposit was provided by meta-sedimentary host rocks. The metal source, on the other hand, remains unconstrained [2, 3].

[1] Obolensky *et al.* (2007) Russ Geol Geophys **48**, 992–1001. [2] Evans (1992) *Curr. Res. Nfld. Dep. Mines Energy, Geol. Surv. Branch,* Report **92–1**, 231–243. [3] Evans & Wilson (1994) *Curr. Res. Nfld. Dep. of Mines Energy, Geol. Surv. Branch,* Report **94–1**, 211–223.

Sediment-water nutrient and Oxygen fluxes in two Antarctic continental shelf areas differently affected by climate change

E. SAÑÉ[1]*, E. ISLA[1] AND A. GRÉMARE[2]

[1]Instituto de Ciencias del Mar (ICM-CSIC), 08003 Barcelona, Spain (*correspondence: sane@icm.csic.es)
[2]UMR EPOC, Université Bordeaux 1- CNRS, Station Marine d'Arcachon, 33120 Arcachon, France

Larsen A and B ice shelves, in the Eastern Antarctic Peninsula (EAP), collapsed in 1995 and 2002, respectively. In 2006, during Antarctic expedition ANTXXIII/8, respiration experiments were carried out onboard R/V Polarstern to measure nutrient and oxygen water-sediment fluxes beneath the extinct Larsen ice shelves and off of the Northern Antarctic Peninsula (NAP), a region which has been free of ice shelves in the last 1000 years [1, 2]. Nutrient and oxygen water-sediment fluxes in EAP were studied to investigate how Larsen ecosystems evolved from a situation of negligible primary production and negligible vertical flux of organic matter to the sea floor under ice shelves [3] to a situation of ongoing primary production after Larsen ice shelves collapse [4]. We found higher nutrient and oxygen fluxes in NAP than in EAP probably related to the higher concentration of particulate organic matter found in NAP sediments [5]. Studies on benthic recolonization after iceberg scouring events suggested that the recovery time for an Antarctic mature benthic community is comprised between 230 and 500 yr [6, 7], with early recovery stages that may take up to 10 yr long, presumably like those found in the EAP benthic ecosystem [8].

[1] Ingólfsson *et al.* (1998) *Ant. Sci.* **10**, 326–344. [2] Anderson *et al.* (2002) *Quat. Sci. Rev.* **21**, 49–70. [3] Littlepage & Pearse (1962) *Science* **137**, 679–681. [4] Bertolin & Schloss (2009) *Polar Biol.* **32**, 1435–1446. [5] Sañé *et al.* (2011) *J. Sea Res.* **65**, 94–102. [6] Gutt *et al.* (1996) *Mar. Ecol. Progr. Ser.* **137**, 311–316. [7] Gutt & Starmans (2001) *Polar Biol.* **24**, 615–619. [8] Gutt *et al.* (2010) *Deep-Sea Research II*, doi: 10.1016/ j.physletb.2003.10.071.