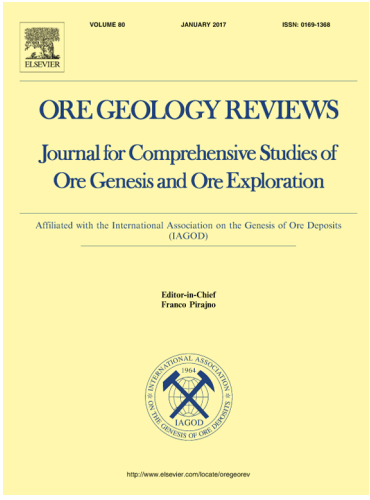

Sedex brine expulsions to Paleozoic basins may have changed global marine $^{87}Sr/^{86}Sr$ values, triggered anoxia, and initiated mass extinctions

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PII: S0169-1368(16)30759-4
DOI: http://dx.doi.org/10.1016/j.oregeorev.2017.02.031
Reference: OREGEO 2133

To appear in: *Ore Geology Reviews*

Received Date: 23 November 2016
Revised Date: 22 February 2017
Accepted Date: 27 February 2017

Please cite this article as: P. Emsbo, Sedex brine expulsions to Paleozoic basins may have changed global marine $^{87}Sr/^{86}Sr$ values, triggered anoxia, and initiated mass extinctions, *Ore Geology Reviews* (2017), doi: http://dx.doi.org/10.1016/j.oregeorev.2017.02.031

Sedex brine expulsions to Paleozoic basins may have changed global marine $^{87}Sr/^{86}Sr$ values, triggered anoxia, and initiated mass extinctions

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Abstract

Sedimentary-exhalative (sedex) ore deposits were formed by discharge of metal-rich brines into ancient ocean basins. Chemical, isotopic, and geologic data from several Paleozoic sedex districts suggest that the brine discharges also supplied enormous quantities of radiogenic Sr and biolimiting nutrients to the oceans. Seven middle Paleozoic sedex events appear to coincide with short-duration positive excursions ("spikes") in the global marine Sr-isotope record that are not explained by current oceanic models. These strong temporal correlations, combined with mass balance evidence and oceanographic modeling, suggest the flux of radiogenic Sr-rich sedex brines may have been sufficient to cause these prominent spikes. If these sedex hydrothermal events are recorded in the secular record, then the $^{87}Sr/^{86}Sr$ record may provide a unique tool for ore genesis studies and for assessing the mineral potential of sedimentary basins of different ages.