

Paleo-redox conditions in the Marinaon glaciation aftermath from Rare Earth Element, Araras carbonate platform (Mato Grosso, Brazil)

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Tracing Precambrian-ocean redox state is a central challenge in the Earth science community. Because of their specific geochemical properties, extended Rare Earth Element pattern (REE+Y) are widely used as a redox and paleo-environmental tracers. Distribution in REE+Y differs in function of the chemical water source (marine, hydrothermal or fresh water and anoxic vs oxic environment) and it has been shown that microbial carbonates are good materials to reflect seawater REE+Y distribution.

Here we present new REE+Y data from 115 Brazilian post-Marinoan Snowball Earth (~ 635 Ma) samples of 5 sections spanning the carbonate platform from proximal section to deeper water distal sections. We compare bulk rocks analyses to specific carbonate leachates and discussed the influence of diagenesis and detrital inputs on the Rare Earth Element signals.

REE+Y patterns obtained on the proximal part of the Araras carbonate platform show strong similarities with modern oxic oceanic water with a Negative anomalie in Ce (with Ce/Ce* reaching 0.69, positive anomalie in Y, enrichment in HREE and a supra chondritic Y/Ho of 49). Values indicates a strong influence of freshwater inputs, in agreement with the silici-clastic deposits observed and with the sedimentary features indicating shallow water deposition for the first carbonate formation deposited (Mirassol d'Oeste Formation).

Deeper in the platform in the upward section of Guia Formation few samples show positive Eu anomaly, no Ce anomaly coupled to LREE enrichment suggesting reduced conditions.