

Trends and noise in conodont Sr and Ca isotopic records

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Isotope composition of marine fossils in Sr ($^{87}\text{Sr}/^{86}\text{Sr}$ and $\delta^{88}\text{Sr}$) and Ca ($\delta^{44/42}\text{Ca}$) records the chemistry of past ocean. These proxies provide evidence for changes of weathering fluxes to the ocean and carbonate flux throughout Earth's history.

Conodont elements, made of fluorine-hydroxyapatite, constitute a superb archive for these proxies being abundant in the fossil record from the Cambrian to the Triassic (over 300 Ma). In addition, they often occur in intervals where other archives (*i.e.*, brachiopods) may be rare or absent. The radiogenic Sr ($^{87}\text{Sr}/^{86}\text{Sr}$), stable Sr ($\delta^{88}\text{Sr}$) and Ca ($\delta^{44/42}\text{Ca}$) isotopic compositions of conodonts from the Upper Devonian Kowala Quarry (central Poland) were measured. The studied interval just precedes the Hangenberg event, a major climatic and biotic event marking the Devonian-Carboniferous boundary. An unexpected signal on the evolution of the chemistry of the ocean before this environmental perturbation has been clearly detected in our material. This new dataset revealed in fact significant difference in the $\delta^{88}\text{Sr}$ and $\delta^{44/42}\text{Ca}$ record in different conodont genera. This result suggests that conodont stable isotope Sr and Ca records are subject to noise or artefacts, likely associated with different conodont ecologies. Reconstruction of the evolution of ocean Sr and Ca chemistry based on conodont elements, thus, requires preliminary investigation of the variability of $\delta^{88}\text{Sr}$ and $\delta^{44/42}\text{Ca}$ record of different conodont genera, or measurement of a single genus along the studied interval.