

The $\delta^{18}\text{O}$ record explored within a dental targets by SHRIMP IIe/MC.

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A numerous spectacular research confirmed that oxygen isotope composition recorded within bioapatitic dental enamel or teeth-like component of a primitive marine vertebrates (conodonts) form a significant identifier of paleoenvironment. Conventionally, enamel has been sampled with a mini-drills or by a bulk analyses of the homogenized conodont material. An alternative method for analysing $\delta^{18}\text{O}$ is to use *in situ* techniques that employ secondary ion mass spectrometry, which is the only technique capable of sampling a spot within the innermost enamel thin layer or directly on microfossils surface, consuming of few ng of sample. This oxygen isotope study was realized on sensitive high resolution ion microprobe in PGI-NRI, Warsaw. We explored the ability of the SHRIMP IIe/MC equipped with demountable Cs⁺ ion source, electron gun, multiple collector and a magnetic field compensator around the sample chamber. Tests have included Devonian conodonts, from Famennian tropical sea (area of Holly Cross Mountain) and a human enamel from the archeological settlement in ancient Mesopotamia. Our tests demonstrate that *in situ* $\delta^{18}\text{O}$ SHRIMP IIe analysis of bioapatitic dental targets can resolve isotopic inhomogeneity on a fine spatial scale and reveal that dramatic changes in climate can have a impact various ecosystems.