

Uranium isotope composition of Eocene marine sediments: does organic matter ?

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Oxygen in seawater is a key parameter for the development of life; changes in dissolved O₂ concentrations throughout the Phanerozoic have played a major role in the evolution of marine ecosystems through complex interactions with dissolved nutrients. However, the precise timing and magnitude of fluctuations in global ocean oxygenation in the past remain poorly constrained.

U stable isotope compositions recorded in marine anoxic sediments may be used to reconstruct the global extent of marine anoxia due to their sensitivity to the removal flux of reduced U(IV) from seawater. Nonetheless, it is critical to understand local sedimentary processes and their impact on U isotope fractionation before any global redox information can be inferred from $\delta^{238}\text{U}$ variations in the sediments. In particular, previous studies have suggested that U isotopes could be fractionated by organic matter in the water column, and that this process might affect the isotope value recorded in the sediment [1,2].

In this work, we explore the impact of organic matter on $\delta^{238}\text{U}$ values measured in Arctic Ocean sediments (IODP Expedition 302) deposited during the Early to Middle Eocene (~56–46 Ma), a period characterised by strong hydrographic restriction and high productivity in the Arctic basin.

[1] Holmden, Amini & François (2015), *Geochimica et Cosmochimica Acta* **153**, 202-215. [2] Hinojosa, Stirling, Reid, Moy & Wilson (2016), *Geochimica et Cosmochimica Acta* **179**, 89-109.