Pore water geochemistry from a depth transect of cores collected on the Iberian Margin

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The chemical compositions of pore waters in marine sediments reflect two principal components. One; changes in the bulk sedimentary composition through diagenetic reactions such as the formation of Mg-rich alumina-silicate clays and dolomite [1]. Two; diagenesis of organic matter, dominated by organic carbon remineralization and reflected in the concentration profiles of redox sensitive trace elements [2]. The translation of chemical gradients into fluxes requires estimates of pore water chemistry across the bottom water - sediment interface. Additionally, the application of benthic foraminiferal calcite chemistry to seawater palaeochemistry requires estimation of the composition of pore waters over the depth habitat of infaunal benthic species, approximately the uppermost 10 – 15 cm, that may differ substantially from bottom seawater because of diagenetic reactions.

We investigate these factors along a depth transect of cores collected on the southwest Iberian continental margin, by utilising pore water measurements derived from shallow 40 cm mini cores and longer 8 m piston cores. We have collected alkalinity, oxygen, DIC and $\delta^{13}C$ in tandem with major and minor cations (e.g. Na, K, Mg, Ca, Li, B, Sr, Ba) and redox sensitive trace metals (e.g. Mn, Fe, Mo, Co, V, U). This approach has allowed us to investigate chemical behavior at the bottom water - sediment interface and downcore diagenetic reactions. Observations on selected cores include a large gradient in $\partial^{13}C$ of DIC, predictable profiles of established redox sensitive electron donors, new insight into non-traditional electron donors (viz: Cr and V), and a significant Li enrichment proximal to the oxygen minimum zone.

[1] Higgins & Schrag (2010) *Geochim. Cosmochim. Acta.* **74**, 5039. [2] Froelich *et al.*, (1979) *Geochim. Cosmochim. Acta.* **43**, 1075