

## Metal geochemistry in sediment core from the SW Portuguese continental shelf

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In order to assess the temporal variation of the terrestrial contribution from rivers of the South Iberian coast linked with the paleoenvironmental evolution of the continental shelf, a long sediment core was collected offshore the Santa Maria Cape. The 5-m long core (VC2B) was collected at 36°53'16"N e 8°04'06"W, 96m below sea level and sliced in 1-cm thick layers. Geochemical (major, minor, trace and rare earth elements) and sedimentological (grain-size, organic matter, carbonate, sand and fine fraction composition) analyses were performed. Three bivalve shells of the VC2B were <sup>14</sup>C-dated by AMS giving 4992 years BP for the base of the core. Sedimentation rate calculated based in <sup>210</sup>Pb excess was 0.50cm.y<sup>-1</sup> for the upper part of the core. The sediment column was divided into three major sedimentary units. The upper one (top to 130cm) is constituted by muddy sediments with Al contents decreasing gradually from 7.3 to 5.3 %. Higher Zn/Al, Cu/Al, Cr/Al, As/Al and Pb/Al ratios were found in the top 40cm, which may be related to mining exploration in the Iberian Pyrite Belt settled in the Guadiana, Tinto and Odiel river basins. The second sedimentary unit (130-456cm) is rather uniform and constituted

by coarser sediments (fine sandy mud) with narrow Al variation (5.0-5.8%). However, a peak in Cu/Al, As/Al and Pb/Al ratios was found at 200cm (1579-2057 cal. yr BP) indicating an input of material probably contemporaneous of Roman mining exploitation. The deeper sedimentary unit (456-500cm) was composed of muddy sand with high carbonate. These units also express different stages of palaeoenvironmental evolution, mainly related with the Holocene sea level rise

Concentrations of total REE ( $\Sigma$ REE) followed the Al variation with higher values in the upper sedimentary unit (105-150 $\mu$ g.g<sup>-1</sup>) in comparison to the deeper one (68-83 $\mu$ g.g<sup>-1</sup>), suggesting that REE abundance is driven by sediment composition. In the upper sedimentary unit, the REE patterns normalized for the European Shale showed an enrichment of LREE compared to HREE. This proportion decreases with depth where an almost flat profile was found in bottom sediments, probably due to a dilution effect from the increase of carbonate biogenic particles. Sediments showed a positive Ce anomaly (Ce/Ce\* = 1.15-1.20) reflecting post-depositional retention of Ce from the water column.

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