



Influence of diagenetic processes and terrestrial/anthropogenic sources in the REE contents of the Cascais submarine canyon (Iberian western coast)

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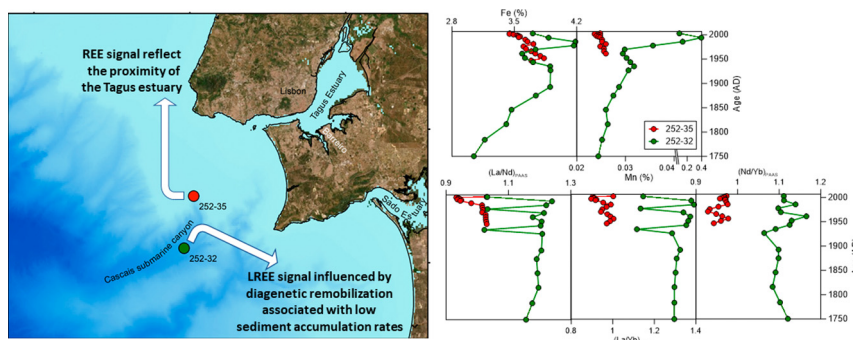
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HIGHLIGHTS

- REE contents were measured in two sediment cores of the Cascais submarine canyon (CSC).
- PAAS-normalized REE patterns show input of Tagus contaminated sediment at the CSC shallower site.
- Influence of diagenetic processes is reflected in the LREE signal at the deeper site.
- The signature of anthropogenic Pb and Hg contamination is clearer in CSC than that of REE.
- REE cannot be considered as contaminants of emerging concern in the CSC sediments.

GRAPHICAL ABSTRACT



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ABSTRACT

Temporal variations of rare earth elements (REE) and their fractionation patterns, major elements, Pb and Hg were determined in two multicores collected at 445 and 2100 m water depth (mwd) in the Cascais submarine canyon (CSC). The PAAS-normalized REE patterns suggest mixing of Tagus estuarine and marine sediments, marked by MREE (Nd-Dy series) enrichment and by positive Eu-anomaly, with marine sediments. The positive Eu/Eu* implies incorporation of detrital feldspar minerals derived from the estuary. Ce/Ce*, (La/Yb)_{PAAS} and (Nd/Yb)_{PAAS} show differences between the two cores. Core 252-35 from the shallower site is enriched in HREE (Ho-Lu series) over LREE (La-Pr series), a pattern also found in the Tagus estuary in the vicinity of an abandoned chemical complex, where the environment is affected by the legacy of massive-sulfide ores processing. There seems to be only limited down-canyon sediment transport to the deeper reaches where core 252-32 was collected. This deeper site shows Ce/Ce* peaks coinciding with low (La/Yb)_{PAAS} values suggesting preferential diagenetic remobilization of LREE relative to HREE. Upcore Pb/Al and Hg/C_{org} trends observed in both cores indicate

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