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Rare earth elements in sediments of the Vigo Ria, NW Iberian Peninsula

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The abundance and distribution of rare earth elements (REE) and their signatures in the Vigo Ria were studied from 50 samples of surface sediments and related to the geological formation in its watershed. The total amount of REE in the Ria is heterogeneous. It ranges from 220mg kg⁻¹ in the southern middle Ria margin in the vicinity of the Galinheiro geological shore complex, which contains REE-enriched minerals, to 2mg kg⁻¹ near the Ria mouth due to dilution with high levels of carbonated biogenic particles (31% of Ca). Rare earth elements of the Ria sediments are considerably enriched in light-REE relative to heavy-REE (a LREE/HREE ratio of 9.771.6) and also show a slightly negative Eu-anomaly. Low European shale normalised REE patterns were distinguished in the innermost sediments of Vigo Ria, but were not correlated with Al. This suggests a minor contribution of REE from upstream freshwater inputs to the sediments in the middle Vigo Ria zone. Normalised REE ratios in the middle Ria imply that fine particles enriched in REE may be exported from the Ria to shelf mud patches and REE can be useful as sediment tracers of Ria input on the shelf.

Palabras clave: Coastal Zone, sediment, Spain, REE, Lanthanides, tracer

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