

Salt Marsh Sediment as source of Osmium to the oceans

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The use of catalytic converters in automobiles has significantly increased the release of platinum group elements to the environment and their coupled behavior was assumed to estimate the anthropogenic contribution [1]. However, new studies reveal a decoupling between Os and Pt because of different released mechanism and ability of dispersion (Pt is particulate and Os as gaseous OsO₄) or/and different dissolution and mobility [2,3].

Intertidal salt marsh cores were sampled in the Tagus Estuary under different vehicular traffic influence. Pt and Os concentrations and ¹⁸⁷Os/¹⁸⁸Os ratios were determined in sediments and interstitial waters. Surface sediment indicates significant Pt contamination (up to 40 ng·g⁻¹), but lack Os enrichment and vehicular traffic source is not detected by the ¹⁸⁷Os/¹⁸⁸Os ratios. Porewaters are not substantially enriched in Pt and Os, however. Intriguingly, Os concentrations and ¹⁸⁷Os/¹⁸⁸Os ratios of porewaters suggest that sediment supplies Os to interstitial water.

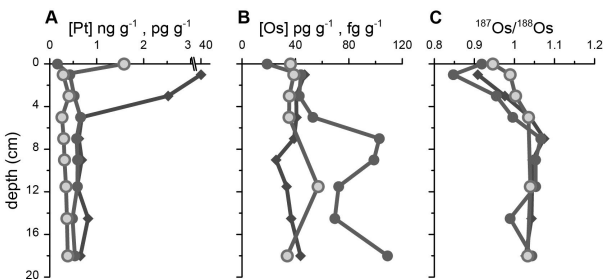


Figure1: Pt (A) and Os (B) concentrations and ¹⁸⁷Os/¹⁸⁸Os ratios (C) in sediment (diamonds) and porewater (circles).

Estimated diffusive fluxes between overlying and interstitial waters suggest that the salt marsh behaves as a sink for anthropogenic Pt and may be a significant Os source to estuarine and oceanic waters. We estimate 22-36 % of oceanic Os could come from salt marshes.

[1] Rauch *et al* (2004), *J. Environ. Monit.* **6**, 335–343 [2] Sharma (2011), *Handb. Environ. Isot. Geochem.* 205–227 (Springer). [3] Almecija *et al* (2014) *ES&T* (In prep).