

Decoupling of Hf and Nd isotopes in western Pacific Fe-Mn crusts

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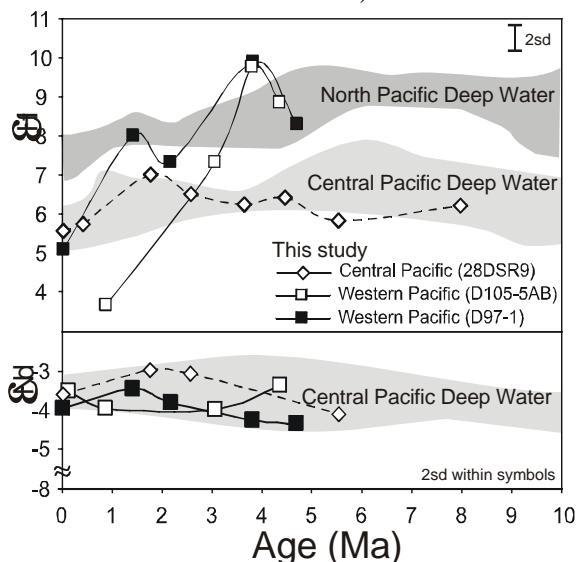
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Previous investigations of Fe-Mn crusts show that both Nd and Hf isotopic compositions of Pacific Deep Water remained relatively constant throughout the Late Neogene (1-3; see Figure 1). Here, we present new ϵ_{Nd} and ϵ_{Hf} records for two Fe-Mn crusts recovered in the Izu-Bonin back-arc Basin (Western Pacific Ocean). In both crusts, the Hf isotopic composition decreases drastically from $\epsilon_{Hf} \sim +10$ to $+4$ over the last 4 Ma (Figure 1). By contrast, ϵ_{Nd} ratios do not exhibit any significant fluctuation in these crusts.

We will discuss potential causes (e.g. circulation changes, volcanic activity, weathering, hydrothermal and aeolian inputs) for this apparent decoupling of Hf and Nd isotopes in Pacific Deep Water through time; and will present complementary Pb isotope data for the same samples.

Figure 1. ϵ_{Nd} and ϵ_{Hf} fluctuations in Pacific Fe-Mn crusts (previous studies shown in shaded areas)



References

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Role of colloids in the metal mobilisation in soils : a field study

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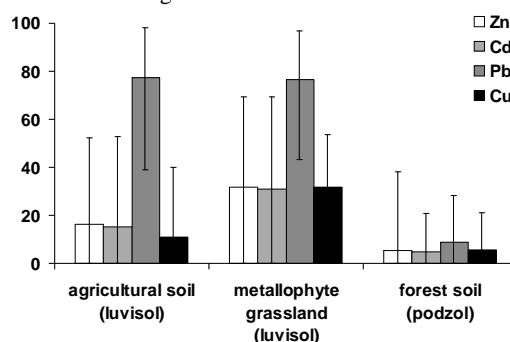
Context

The impact of mobile colloids on the transport of trace metals in soils is not well understood. One of the reasons is the low number of field studies. This study aimed at determining (i) the nature of colloids in gravitational waters collected *in situ* by zero-tension lysimetry in various types of soils, (ii) the role of these colloids in metal mobilisation in contaminated soils by Zn, Cd, Pb, and Cu.

Results

Colloidal and dissolved forms of trace metals are separated by ultracentrifugation and colloids observed by analytical electron microscopy. Results after two years of *in situ* study show that (i) the nature of mobile colloids is very different according to the nature of soils (Citeau et al., 2001) and (ii) colloids are not involved for all metal transfers: while Pb is present in colloidal forms in gravitational waters with a mean of 70 to 80 %, Zn, Cd, and Cu are found mostly in dissolved forms (figure). However proportion of colloidal forms depends on the nature of soil. Colloidal forms of metals are found to be either organic (bacteria) or mineral (phyllosilicates, Al- or Fe oxyhydroxides and phosphates).

Percentage of metals in colloidal form with max and min values observed in gravitational waters



Conclusion

If the Pb-link with colloids is stable then colloids play a real role in the transport of Pb in soil profiles. For Zn, Cd, and Cu the mobilisation in colloidal form seems to be more influenced by specific soil physico-chemical conditions depending on soil type and land management. Reactivity and stability of colloids towards metals according to the nature of soils are further studied.

Reference

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