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# Mo dynamics at the sediment/water interface of tidal flats (NW Germany): An experimental approach

N. Kowalski (1), O. Dellwig (1), M. Beck (2) and M. E. Böttcher (1)

(1) Leibniz Institute for Baltic Sea Research Warnemünde, 18119 Rostock, Germany, (2) Institute for Chemistry and Biology of the Marine Environment, Carl von Ossietzky University of Oldenburg, 26111 Oldenburg, Germany

(nicole.kowalski@io-warnemuende.de / Fax : +49 (0) 381-5197-352 / Phone : +49 (0) 381 5197-361)

Molybdenum generally behaves conservative in oxygenated ocean water, i.e. its distribution exclusively follows salinity. However, non-conservative behaviour of Mo was observed during certain time periods which are connected with changes in productivity in the Wadden Sea of NW Germany. During early summer month in 2005 and 2007 the concentration of dissolved Mo decreased rapidly by more than 50% along with a corresponding Mo-enrichment in the particulate phase. A few weeks later, Mo concentrations increased drastically in pore waters and were up to four-times higher than the usual seawater level. Additionally, elevated values are observed in the open water column most probably caused by a release from the sediments.

To understand this phenomenon we postulate a conceptual model which is based on a tight coupling between geochemical, biological, and sedimentological processes (Dellwig et al., 2007). The occurrence of elevated Mo concentrations in pore waters and their release to the open water column however remains obscure. Thus, the transformation processes at the sediment/water interface is studied by laboratory experiments with natural and artificial sediments. One goal of the experiments is to examine the exchange processes between the solid and dissolved phase in partly sulfidic systems. Under controlled conditions the material input is manipulated to investigate its effects on microbial activity and corresponding trace metal cycles. The manipulation of environmental conditions may provide information about the influence of

abiotic and microbial processes on the release and fixation of Mo in the sediments. Bulk geochemical analyses by ICP-MS and ICP-OES will be complemented by measurements of Mo-isotopes. Preliminary results of these experiments will be presented in this contribution.

References

O. Dellwig M. Beck, A. Lemke, M. Lunau, K. Kolditz, B. Schnetger, H.-J. Brumsack (2007): Non-conservative behaviour of molybdenum in coastal waters: Coupling geochemical, biological, and sedimentological processes. Geochim. Cosmochim. Acta 71, 2745-2761