Geophysical Research Abstracts, Vol. 8, 09939, 2006
SRef-ID: 1607-7962/gra/EGU06-A-09939

In-situ microsensor measurements of pore water sulfate gradients at different salinities

A.M. Al Raei (1) , M.E. Böttcher (1,2), D. deBeer (1), T.G. Ferdelman (1)

(1) Max Planck Institute for Marine Microbiology, D-28359 Bremen, FRG, (2) Leibniz Institute for Baltic Sea Research, D-18119 Warnemünde, FRG

Precise high-resolution sulfate measurements are fundamental for the evaluation of consumption and production of sulfate in dynamic surface sediments such as intertidal flats. Especially sediments with high near-surface activities of sulfate-reducing bacteria and in sulfate-limited fresh-water sediments, steep sulfate gradients may develop. We have adapted a potentiometric sulfate microsensor for in situ measurements that has a membrane containing an ionophore with a high selectivity for sulfate. Our sulfate microelectrodes exhibit a Nernstian response to sulfate in the concentration range from 10-6 to 10-2 M and work well in fresh water. We have modified the electrode to minimize chloride interference for use in marine sediments; results from Wadden sea sediments appear promising. Examples will be presented from different fresh water sediments as well as coastal marine intertidal sediments.