

**Study of Cadmium Interaction with Humic Substances at the  
Mercury/Water Interface**

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The fate of many trace substances especially trace metals in natural waters depends on the interaction with present organic matter and different surfaces. A large amount of organic substances beside complexing properties towards metal ions exhibit also surface active properties. Because of their characteristic molecular structure consisting of structural groups that have very little affinity for the water phase (hydrophobic groups) together with the groups that have a strong attraction for water (hydrophilic groups). Such organic substances accumulate at different phase boundaries. On that way they mediate the behaviour of trace metals on the phase boundaries. Adsorbed organic compounds on the mineral/water interface can influence dissolution processes and crystal growth as well as adsorption and scavenging processes of microconstituents and contaminants.

Electrochemical investigations of adsorption processes and interactions in the adsorbed layer at the mercury/water interface were found very useful for the study of interfacial phenomena which are interesting for natural aquatic systems (1,2,3).

Very useful information on the adsorption behaviour of different organic substances and their mixtures can be obtained by investigation of the influence of the adsorbed layer on the electrode processes of metal ions. So far the reduction process of metal ions at the electrode surface in the presence of the adsorbed organic layer has been studied. This can serve as a simplified model for adsorption and precipitation of metal ions at natural mineral/water phase boundary in the presence of organic coatings.

Additional information on mineral dissolution one can obtain by electrochemical investigation of anodic dissolution of metal at the mercury/water interface covered by the film of adsorbed organic molecules.

By using differential pulse voltammetry at the HMDE in this work we compare anodic dissolution and cathodic deposition of cadmium in the presence of humic acid in chloride solutions and seawater. The complexing properties of the used humic substance towards cadmium ions were examined as well. The influence of Ca and Mg ions and pH value of solution upon adsorption and interactions of cadmium ions with humic acid were studied.

**References:**

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