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Model Adsorption Studies of Zn, Pb, Cu and Cd on SiO_2,-Al_2O_3 and MnO_2 Added to Adriatic Sea Water Samples

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For most heavy metals in sea water undersaturated with respect to any likely solid phase and Krauskopf (1) has suggested that the concentration is reduced due to adsorption processes. It was pointed out recently (2) that speciation and interfacial processes of trace metals in sea water is not known enough. In Adriatic sea up to present time only the concentration of reducible and total trace metal ions have been controlled. For better understanding of the solubility and geochemical cycles of some trace metal ions in Adriatic sea, the adsorption of Zn, Pb, Cu and Cd was studied on various model oxide surfaces, added to sea water samples. Experimental data on adsorbents SiO_2 (Ludox SM 30) and Al_2O_3 (Alon), which have been reported recently (3) are completed with the new data on MnO_2. Experimental data are presented in forms of Langmuir adsorption isotherms and are discussed in dependence on the speciation in sea water.

Surface coverages as well as approximate values of adsorption constants of the studied trace metals are compared for each oxide surface separately. Cadmium as not adsorbable ion could present a special danger in polluted sea water.

REFERENCES

1. K.B. Krauskopf, (1956), Geochim. Acta, 9, 1.

2. Dahlem Konferenzen, "The Nature of Sea Water", ed. E.D. Goldberg, Berlin 1975, p. 467.

3. H. Bilinski, S. Kozar, and M. Branica, (1976), Adsorption of Heavy Metal Traces on Particulate Matter in Sea Water, Paper presented at ICCS, San Juan, Puerto Rico, June 21-25.

DISCUSSION

Questions and comments:

1. In formula $y=(bx^2 + ax)/(bx^2 + ax + 1)$ it is possible to make a best-fitting with experimental points and sea the difference of a and b constants found and the theoretical ones? (C. DEJAK, Italy).

- In published paper the values of a and b will be redetermined to fit the experimental points and compared with values used for calculation of theoretical curves. Thank you for this suggestion.

2. Has the so called Student´s (T) test been applied to the data? This is a standard statistical test to arrive at a coefficient of correlation, i.e. a confidence coeficient. (P. SONNENFELD, Canada).

- No statistical interpretation was used.

3. Have you done experiments like this with $Fe(OH)_3$? (F. CANADA, Spain).

- We plan to extendour experiments and use goethite (α-FeO OH) as an adsorbent. Also, experiments imitating adsorption at estuary conditions are already in progress (H. Bilinski, M. Bacaj and M. Branica).