SOME PHYSICO-CHEMICAL PROPERTIES OF SEAWATER SUSPENDED MATTER AND SEDIMENTS

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Summary. Suspended matter and sediment form seawater and an estuary were characterized by measuring the electrophoretic mobilities of particles cation exchange capacity and ability to adsorb cadmium (109-Cd). The seawater suspended matter and sediment are negatively charged, show low ability to adsorb/bind cadmium; C.E.C. values are low for seawater sediment, much higher for estuarine sediment.

Résumé. La matière en suspension et les sédiments de l'eau de mer et de l'estuaire ont été caractérisés par la mesure de la mobilité électrophorétique des particules, de la capacité d'échanges cationiques et de leur propriété d'adsorption du cadmium (109 Cd). La matière en suspension de l'eau de mer et des sédiments a une charge négative et montre une faible capacité d'adsorption du cadmium. Les valeurs C.E.C. sont basses pour le sédiment de l'eau de mer et plus élevées pour le sédiment de l'estuaire.

Suspended matter and sediment from the seawater (the Northern Adriatic) and estuarine water were characterized in order to obtaine some information on the ability of these materials to adsorb/and/or bind heavy metals. For this purpose electrophoretic mobilities of particles (sediment and suspended matter), cation exchange capacity (C.E.C.) of sediment and adsorption of cadmium on sediment and suspended matter were measured. The cationic ion-exchange capacity was determined for sediment only. The salinity of seawater was 37 $^{o}/_{oo}$ and of estuarine water 2 $^{o}/_{oo}$.

Electrophoretic mobilities of particles were -1.32×10^{-4} and -1.41×10^{-4} $cm^2V^{-1}sec^{-1}$ for seawater suspended matter and sediment respectively. Electrophoretic mobilities of estuarine seawater and sediment particles were -2.1×10^{-4} and -2.3×10^{-4} $cm^2V^{-1}sec^{-1}$, respectively. Electrophoretic mobilities of estuarine samples have similar values as the samples from unpolluted lakes an rivers. Seawater suspended matter and sediment particles have lower electrophoretic mobilities than the estuarine samples although the salinity of seawater used in electrophoretic experiments was similar to that of the estuarine water.

Cationic ion-exchange capacity (C.E.C) values for seawater sediment were 16.44 (fraction 32/um) and 11.19 meq/100 g (fraction 125-250 /um).

The above C.E.C. values correspond to the values determined for inorganic materials without organic cover, e.g., kaolinite or

quartz. The C.E.C. value for estuarine sediment samples was 44.4 meq/100g which corresponds to values of polluted river sediments and suspended matter.

Concentration factors (K_d values) for sediments and suspended matter for adsorption of cadmium (109 Cd) were determined and the results are presented in the following Table.

Table 1. Concentration factors (log K_d values) (ml/g)

Conc.Cd (µg/l)	t hours	North.Adr. susp.matt. S=37.4 °/oo	S=1.9	North.Adr. sediment S=1.9 °/oo	Krka est. susp.matt. S=2°/oo	Krka est. sediment S=2°/oo
1.17	2	no ads.	1.39	-	3.65	3.19
	24	2.23	3.19	2.34	3.71	-
2.9	2	no ads.	2.46	2.89	3.48	3.50
	24	2.70	2.07	2.93	3.39	2.47
11.7	2	no ads.	3.36	2.99	3.12	3.22
	24	2.92	3.27	1.93	3.34	3.14
175.6	2	no ads.	2.74	2.46	3.13	3.17
	24	2.06	2.57	2.76	3.36	2.38

Adsorption of cadmium on the seawater suspended matter and sediment is rather small even in diluted seawater (S=1.9°/oo). In undiluted seawater (S=37.4°/oo) after two hours adsorption there was no evidence of cadmium adsorption on suspended matter.
Samples of the Krka estuary suspended matter and sediment show higher K_d values but still one order of magnitude lower than suspended matter or sediment from continental polluted rivers. It seems that presence of seawater major constituents keeps cadmium in solution, specially chloride ions which with cadmium form relatively strong chloro (mono- and di-chloro) complexes.