

Adsorption of Cadmium and Lead ions on varied calcite concentrations from estuarine water and seawater

S. KOZAR¹, H. BILINSKI², S. SIRAC² and M. BRANICA¹

¹ Center for Marine Research, "Rudjer Boskovic" Institute, ZAGREB (Croatia)

² Department for Physical Chemistry, "Rudjer Boskovic" Institute, ZAGREB (Croatia)

Laboratory experiments on the adsorption of lead and cadmium on model phases improve our knowledge on the behaviour of these metal ions in natural aquatic systems. Recently, we have investigated their adsorption on calcite, in order to explain the distribution of these ions in the waters of the calcereous Krka River Estuary (1). The adsorption data obtained can be described by the S-1 type of empirical adsorption isotherm, rather than by the Langmuir's model. These curves were clearly incomplete because the saturation of the calcite surface in the systems studied has not been reached, so that the adsorption constants could not be calculated.

In the present work the particle concentration effect on the adsorption of lead and cadmium ions from estuarine water and seawater was studied. A Coulter Counter method was used to study the change of particle size and their specific surface area with the particle concentrations in the range between and 1×10^{-5} to 1×10^{-3} kg dm⁻³. Measurements were performed in waters of different salinities, after equilibration of 24 hours. Results have clearly demonstrated that with an increase of particle concentration also increases the percentage of large particles. The indicated aggregation of the calcite particles consequently leads to a loss in the specific surface area.

Using the measured relationship between the concentration and the specific surface area of the calcite particles, the adsorption isotherms of cadmium and lead ions on calcite was reinterpreted and the values of the adsorption constants were obtained.

REFERENCES

1. KOZAR S., BILINSKI H., and BRANICA M., 1992.- Adsorption of lead and cadmium ions on calcite in estuarine waters and seawater. *Mar. Chem.* (in press).

The distribution of nutrients in the surface layer of the Krka Estuary

Grozdan KUSPILIC

Institute of Oceanography and Fisheries, SPLIT (Croatia)

The traditional method of reporting nutrient distribution in estuaries is their presentation against normalized salinity.

In the case of the Krka Estuary (Middle Adriatic Sea), which can be classified as a "salt wedge" type (Fig. 1.a), this method is also useful.

The information obtained can be immediately visible (Fig. 1.b) and as in the case of silicate allow a conclusion of its conservative behaviour.

The more frequent occurrence given on the example of ammonia (Fig. 1.c) shows that basic direction of nutrient deviations along the estuary can also be observed, but the identification of the corresponding station, however, is difficult.

Figs. 1.e and 1.f show a modified representation of the nutrient deviations from their theoretical values, taking in account the station position.

This type of diagram appears to be useful in combination with other available parameters, i.e. Chl a (Fig. 1.d) (1).

Based on the data for the Krka Estuary in 1990 and 1991 (2), this paper demonstrates the non-conservative behaviour of nutrients in the surface layer and discusses their deviations.

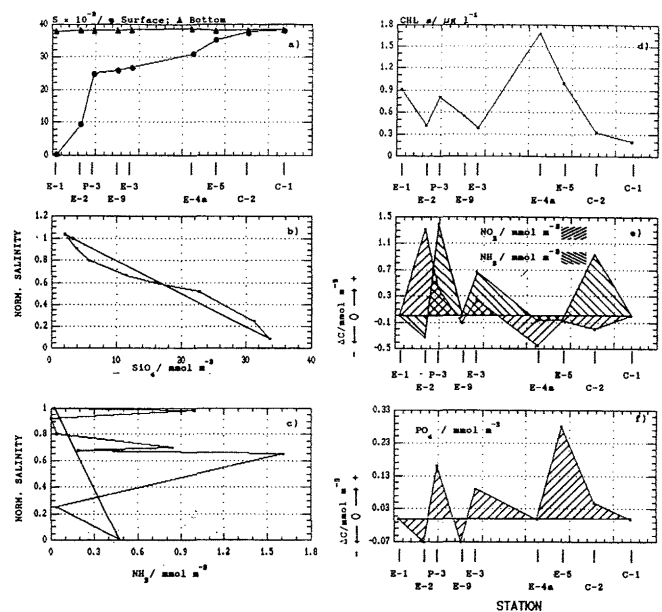


Fig.1. a) Salinity values in the surface and near bottom layer, b) Silicate against normalized salinity, c) Ammonia against normalized salinity, d) Chlorophyll a, e) Modified diagram of nitrate and ammonia deviations along the Estuary, f) Modified diagram of phosphate deviation along the Estuary. All values are given for August 1990, except silicate (April 1990).

REFERENCES

- (1)PRECALI R.- *Pigments*, in V. Zutic (coordinator): Long-term Investigation and Pollution Monitoring of the Krka Estuary and Kornati Archipelago. MED POL-Phase II. Annual Report for 1990 and 1991. Center for Marine Research, Zagreb. R. Boskovic Institute.
- (2)GRZETIC Z. and KUSPILIC G.- *Nutrients*, in V. Zutic (coordinator): Long-term Investigation and Pollution Monitoring of the Krka Estuary and Kornati Archipelago. MED POL-Phase II. Annual Report for 1990 and 1991. Center for Marine Research, Zagreb. R. Boskovic Institute.