

## Precipitation Processes of Slightly Soluble Lead(II) Salts in Electrolyte Solutions

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Precipitation processes of slightly soluble lead phosphates and carbonates stable in conditions of seawater are studied by turbidity, anodic stripping voltammetry, Coulter Counter, electron and optical microscopy methods. X-ray diffraction patterns were used to identify various precipitates.

In order to understand the behaviour of lead in natural waters we need to know: the solubility and kinetics of the formation of thermodynamically stable solid phases in addition to chemical speciation and adsorption properties of lead.

Solubility of lead in various types of waters can be determined by different lead phosphates and/or carbonates.

Model precipitation studies in electrolyte solutions and in seawater and model calculations have been performed to complete limited knowledge of the nucleation and crystallization processes in natural waters.

## DISCUSSION

## Questions and comments:

1. What is the solubility limit of lead in sea water?  
(Lj. Musani, Yugoslavia)
  - In the case that solubility of lead is determined by the solubility of  $\text{PbCO}_3$  as the most stable phase, the solubility limit is about  $5 \times 10^{-7} \text{ mol dm}^{-3}$ . In order the case of chloropyromorphite formation, solubility of lead is about  $4.5 \times 10^{-9} \text{ mol dm}^{-3}$ , what is in very good agreement with the experimental value determined by Branica et al. (1974) in Northern Adriatic sea water. We have calculated this value in our recent paper (H. Bilinski and M. Marković, Croat. Chem. Acta 50 (1977) 125.).
  
2. Is the coulter-counter a good instrument for determining particulate matter with very different size? (R. Ferrara, Italy)
  - I would like to ask Mr. M. Juračić and Mr. M. Marković to answer this question in details. My opinion is that the instrument is suitable for such determination. (H. Bilinski, Yugoslavia)
  
3. I'd like to add that Coulter-counter is a very good instrument for such measurements. The new model used, divides particles according to their diameter in sixteen channels in the range of 0,3 - 18  $\mu\text{m}$ . (M. Juračić, Yugoslavia)
  
4. Particles suspended in an electrolyte are sized and counted by passing them through an orifice (aperture) with a specific path of current flow for given sample volume. Particle number and sizes are determined using 30  $\mu\text{m}$  - 2000  $\mu\text{m}$  orifice tubes. Each orifice tube measures particles with volume diameter of 2 - 35% of the aperture diameter. (For instance 30  $\mu\text{m}$  orifice tube detects particles

of 0.6 - 10.5  $\mu\text{m}$  in volume diameter). By combination of different tube orifices instrument can detect particles of 0,6 - 700  $\mu\text{m}$  in volume diameter.

Coulter Counter Mo TA instrument is a 16 channel particle size analyzer. The particles are distributed into channels by their volume. Since the volume of particles placed in two adjacent channels relate as 1 : 2, the relation between the particle volume in the first and sixteenth channel is 1 :  $2^{15}$  (geometric series where  $q = 2$ ). The output data of the instrument are the total number of particles in a certain suspension volume and the volume distribution by volume diameter. (M. Marković, Yugoslavia).

