

PRELIMINARY STUDY OF URANYL ION INTERACTION WITH SALYCILIC
AND PHTHALIC ACID IN SEAWATER

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Summary. The interaction of uranyl ion with salycilic and phthalic acid in seawater was investigated applying a.c. and differential pulse polarography. The results of these measurements were compared with the binding mechanism of uranyl ions with humic acid in seawater.

Résumé. *L'interaction d'uranyl-ion avec l'acide salycilique et phthalique dans l'eau de mer a été examinée par polarographie de courant alternatif et par polarographie différentielle impulsionnelle. Les résultats obtenus ont été comparés au mécanisme de la liaison d'uranyl avec l'acide humique en eau de mer.*

The purpose of this study was electrochemical investigation of uranyl ion interaction with model substances-salycilic and phthalic acid - of the humic acid's active part. In-phase a.c.⁽¹⁾ and differential pulse polarography⁽²⁾ proved to be the most convenient. By a.c. polarography with hanging mercury drop electrode at the natural pH of seawater (8.2), only reduction of uranyl hydroxide was registered, because of a very irreversible nature of the uranyl tricarbonate ion reduction, which is the predominant species in seawater under these conditions. By differential pulse polarography with dropping mercury electrode the reduction peak of uranyl tricarbonate (at -0.85 V/SCE) and uranyl hydroxide (at -0.55 V/SCE) were recorded in pH range from 8.2 to 5.0 according to the theoretical distribution of uranyl species in seawater⁽³⁾. At lower pH values (about 4) the reduction of uranyl phthalate complexes was registered at -0.45 V/SCE and -0.40 V/SCE, both on a.c. and differential pulse polarograms. At pH < 3 only free uranyl ion exists in the solution which is reduced at -0.2 V/SCE. These results can be compared with the proposed binding mechanism^(4,5) of uranyl ion with humic acid in seawater. Furthermore, they showed that it is possible to use electrochemical methods for the investigation of uranyl ion complexes with organic acids - models of humic acids, which showed to be a very good substrate in the recovery of uranium from seawater. Other than a.c. and differential pulse polarography were less convenient because no separate reduction waves of free and complexed uranyl ion were registered and adsorption phenomena were very distinct.

References.

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