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MODEL CALCULATION OF Pu, Am AND Np SPECIATION IN SEAWATER AT VARIOUS REDOX CONDITIONS

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The present work is a continuation of earlier experimental studies of Fukai et al. (1981, 1986) in which only simple model calculation was performed on plutonium. To get a more complete picture about predominant complexes of plutonium, neptunium and americium in sea water equilibrium calculation was performed, using computer program SOLGASWATER (Eriksson (1979).All major components of seawater have been used to prepare the composition matrix and also all available equilibrium constants for complex formation. Calculation was performed at constant value of pH (pH=8.0) and redox conditions were changed from $p\varepsilon$ = 12 to $p\varepsilon$ = (-4).
Speciation of plutonium, neptunium and americium is presented in Fig. 1 a, b, c. For plutonium it was found that five -valent species PuO_2^+ predominates and it is in equilibrium with hexavalent species $PuO_2(CO_3)_2^{2-}$ and tetravalent species $Pu(OH)_4$. According to our earlier results[3] fivevalent species will disproportionate to hexa- and tetravalent species.
For neptunium it was found that fivevalent bicarbonato complex $NpO_2(HCO_3)_2^-$ is very stable and that americium predominates as $AmCl^{2+}$ in the threevalent state. At anoxic condition is plutonium in threevalent state as $PuOH^{2+}$, neptunium is in tetravalent state as $Np(OH)_5^-$ and americium does not change the oxidation state.
Model calculation strongly depends on the validity of used constants, results will be compared with recent experimental data in the literature and discussed in connection with geochemical cycles of these elements.

LITERATURE:
Eriksson G. (1979), Anal. Chim. Acta 112 , 375-383.
Fukai R., Yamato A., Thein M. and Bilinski H. (1981) In: Techniques for identifying transuranic speciation in aq. env., IAEA Vienna. 37-41.
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Fig.1a

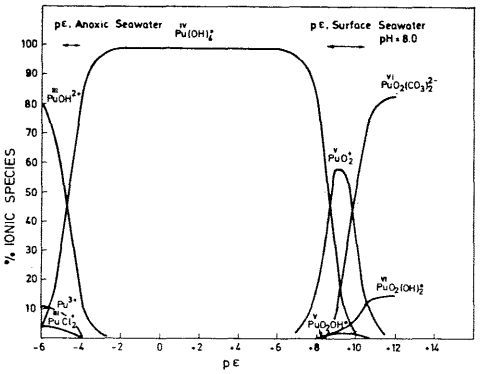


Fig.1b

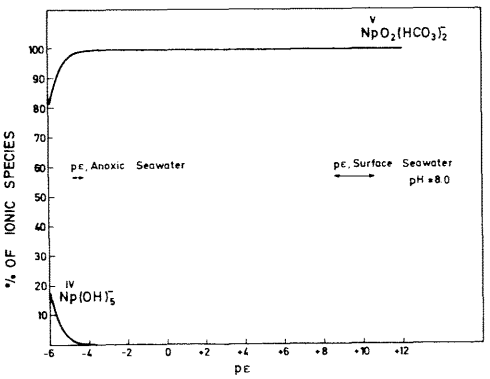
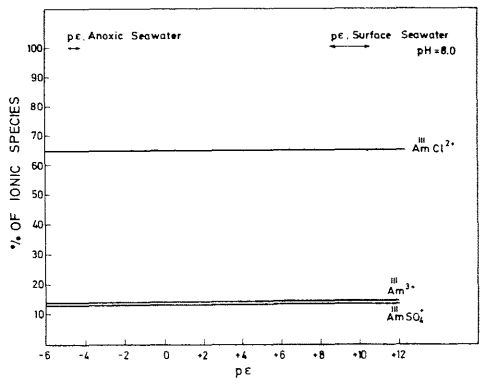


Fig.1c



Y-IV5

THE EFFECT OF MERCURY ON PROTEIN AND CHOLESTEROL SYNTHESIS IN THE MUSSEL MYTILUS GALLOPROVINCIALIS

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Abstract

The effect of mercury's different sublethal concentrations on protein and cholesterol levels in mussel's "Mytilus galloprovincialis" hepatopancreas and foot muscles, measured 10 days following mercury's administration, was investigated. In the foot the levels of protein and cholesterol, in comparison to that of hepatopancreas was found to be higher. In the control, the average protein and cholesterol levels of the foot were 21.32 % and 0.856 %, respectively; and in the hepatopancreas the same levels were 7.50 % and 0.773 % respectively. $HgCl_2$, at low concentrations causes an increase in protein and cholesterol levels in both the foot and the hepatopancreas as in comparison to the control. In inverse proportion with the increasing concentration of $HgCl_2$, the protein level decreases in both the foot and the hepatopancreas, but this diminished value is still higher than that of the control at the highest mercury level (1 mg/l) used. On the other hand, at this concentration cholesterol's level drops below that of the control. Thereby, according to these observations, chronic mercury poisoning causes an increase in protein and cholesterol levels.