

BIOGEOCHEMICAL INFLUENCES ON THE BEHAVIOUR OF RADIOIODINE IN SURFACE FRESH WATER AND SOILS

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The paper deals with some new detailed insights into the chemistry of iodine in aquatic environments. These may have some importance for understanding the radioecological behaviour of radioiodine, since the transfer of radionuclides in general is basically connected with their chemical states and reactions. In detail it was found:

- In surface water and in aerated soil water, iodide undergoes chemical reactions involving oxidation and tending to reach an equilibrium in which only a small part of the iodine remains in the form of iodide.
- The chemically converted iodine does not turn out to be iodate. In fact the evidence strongly indicates the formation of organic iodine compounds. Moreover iodate shows a tendency to be reduced and thus to be included in these processes.
- The above chemical transformations are instigated by microbiological activity; a great deal can be said about the mechanism of instigation.
- In surface water the formed iodine compounds are mainly dissolved, while in soils a nearly complete incorporation of the iodine into indissolved materials occurs.
- The exact nature of these organic iodine compounds has not yet been determined, but on the basis of the chromatographic techniques, electrophoresis, extraction and precipitation procedures used in these investigations a good deal about their chemical and physico-chemical properties has been revealed.

The observed effects can play a decisive role in the behaviour of radioiodine in the environment, e. g. they can explain the relatively strong retardation of radioiodine observed in soils. They also will have some importance for the performance of analytical procedures in radioecological studies.