

Experimental research concerning the radionuclides transport in Danube river delta

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Abstract - In previous works, a general insight on the transport and sedimentation of suspended matter in the storage lakes of inland rivers of Romania, have been investigated. A search to find a correlation between the velocity and solid discharge of Danube river and the radionuclides distribution in a certain cross section, is presented.

Résumé - Des mesures ont été effectuées dans une section du delta du Danube, concernant les vitesses du courant de l'eau, de la turbidité, ainsi que la présence de dix radionuclides artificiels dans l'eau filtrée, les suspensions et les sédiments. Les expériences ont été poursuivies dans différentes conditions hydrologiques, en vue d'établir une prognose sur le transport des radionuclides.

Introduction

The aim of this work, is to establish a relative prediction for the transport capacity of radionuclides by Danube river. Preliminary experiments in front of Chatal site (bifurcation of Danube river into Sulina and Sfîntul Gheorghe branches), have been performed. Because suspended matter is very important in transporting the radionuclides, it was necessary to check some engineering data known in the literature^(1,2), with our specific conditions concerning the mechanism transport of suspended matter by Danube. Instead of using a radio-tracer, the artificial radionuclides already present in water were applied, despite their activity.

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Materials and Methods

The hydrological measurements in ten vertical sections for liquid and sediment discharge have been carried out. Ten fission and neutron induced nuclide distribution have been determined by analyzing their characteristic gamma-lines, by means of a Ge(Li) detector coupled to a multichannel pulse height analyzer. The suspended matter, the surface water as well as the corresponding vertical bedload sediments have been investigated.

Conclusions

The distribution coefficient of some radionuclides in Danube samples has been determined. The interpretation of the experimental data on the radionuclides transport has been computed, taking into account the following hydrological data of Danube for 29 March 1976: liquid discharge, 2360 m³/s; solid discharge, 249 kg/s; maximum turbidity, 0.204 g/l; average velocity, 0.684 m/s; average depth per cross section, 9.13 m.

References

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No question.