

CONTRIBUTIONS TO THE CHEMICAL STUDY OF THE BED-LOAD
SEDIMENTS COLLECTED ON ROMANIAN CROSS-SECTIONS OF
DANUBE RIVER

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Summary : Bed load sediments collected on selected cross-sections and verticals of Danube river during 1978-1979, by chemical and spectral methods were analysed. The distribution of the microelements as Zn, Co, Sr, etc., grain size and flow parameters are discussed.

Résumé. Des échantillons de sédiments prélevés pendant les années 1978-1979, à la surface du lit du Danube, depuis l'entrée du fleuve en Roumanie jusqu'à l'embouchure dans la mer Noire, ont été analysés par les méthodes de la chimie analytique et de l'analyse spectrale. 30 éléments chimiques environ ont été déterminés. Parmi les macroéléments figurent les suivants : Si, Fe, Al, Ca, Mg, Mn, P, Ti, Na et K. On discute la distribution des microéléments Zn, Co, Sr, etc. Les paramètres hydrauliques sont corrélés avec les verticales et les sections de prélèvement des échantillons.

The chemical composition of the bed river sediments has great influence on the retention and exchange of the man-made radionuclides between the crystalline lattice and the soluble form of the radionuclide in water. The aim of this work is to investigate the chemical composition of the bed load sediments of the Danube river during 1978 and 1979 from the entrance of Danube in Romania at Bazias, then in some interesting cross sections along the flow river till Sulina-Port at the Black Sea. The analytical and spectral methods used

are those described in /1/ for: Si, Fe, Al, Ca, Mg, Mn, P, Ti, Na, K, Zn, Sb, Sr, Co, Ag, Sn, Zr, W, Ge, Cu, Cd, Pb, V, Be, Ce, La, Y, Yb, Mo, As, Cr.

From the chemical analyses and others by X-ray diffraction it has been concluded the bed river of Danube is made of illite with general formula $(AlSi_3O_{10})nH_2O$, where Al is usually substituted by K and Fe. A sample of illite has more than 50% SiO_2 . Concerning the concentration of the macroelements in the bed load sediments during 1978 and 1979, there is not great differences, some of them being about constant. On the other hand it must be outlined the following conclusions for the microelements: *Arsen* was present during 1978 in eleven of twenty nine samples, while during 1979 it was lack. *Zinc* varied between 65 ppm at the entrance of Danube in Romania, at Bazias to 42-62 ppm at Bechet, 93 ppm at Tchatal-Ismail (Danube river delta) and 114 ppm at Sulina-Port at the Black Sea. In the dry residue of surface water layers, *Zinc* varied from 90, 180, 263 and 510 ppm in the whole period 1978-1979. *Cobalt* from 3 to 8 ppm, while *Silver* was present in fifteen of twenty nine samples. The content of *Strontium* was 45 to 90 ppm in most of samples, in eight 120 to 180 ppm while at Sulina-Port 800 and 1500 ppm. Two figures are illustrating the correlations between the flow velocity, turbidity, depth of the river and grain size diameter of the particles at Bechet cross section. Minimum diameter of the grain, $d_{min}=0.05$ mm, while maximum, $d_{max}=2.0$ mm.

REFERENCES

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