Instrumental neutron activation analysis and chemical composition of the sediments collected at 200 m depth on the floor of the Black Sea

by

IULIA I. GEORGESCU,* MARIA SALAGEAN** and SANDA LUPAN***

**Polytechnic Institute, Bucharest (Romania)*
***Institute of Atomic Physics, Bucharest (Romania)*
****Geological Committee, Bucharest (Romania)*

Summary

Sediments taken from 200 m depth on the floor of the Black Sea, as well as those of lagoonar region of Razelm, were analysed by instrumental neutron activation analysis. Were identified : Al, Mn, I, Cl, Ba, K, Sc, Cr, Co, Rb, Sb, Cs, La, Ce, Eu, Tb, Lu, Hf, Ta, Th and Na. By spectral analysis were determined the content of Cu, As, Pb, Mo, Ni, Ag, Fe, V, Zr, P, S.

Résumé

En appliquant l'analyse par activation neutronique, on a déterminé les microéléments des sédiments de la mer Noire à une profondeur de 200 m, ainsi que ceux de la région lagunaire de Razelm, pour comparaison. On a identifié les éléments suivants : Al, Mn, I, Cl, Ba, K, Sc, Cr, Co, Rb, Sb, Cs, La, Ce, Eu, Tb, Lu, Hf, Ta, Th et Na. Par analyse spectrale ont été déterminés : Cu, As, Mo, Ni, Fe, V, Zr, P, S, et l'Argent par absorption atomique. On a conclu que le manganèse, le barium, l'iode et le chlore sont plus concentrés dans les sédiments lagunaires de la zone aérobe.

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Introduction

In a previous paper has been studied the concentration of the microelements in the sediments of the aerobe zone of the Black Sea Romanian coast [1]. In the present work it will be reported some results concerning the microelements content in the sediments of the anerobe zone of the Black Sea, in comparison with those collected in the lagoonar region of Razelm (South of Danube Delta).

Methods used, results and conclusions

All the samples (few mgs of dry matter) and standards embedded in pure thin aluminium foil, put in the same geometry, have been irradiated in two steps, for short and long — lived (n, γ) radionuclides in the VVR-S Atomic Reactor of the Atomic Physics Institute of Bucharest. The irradiation time was 50 hours in a flux of 1.5×10^{13} neutrons/cm^2/s and a decay time of 10 days for long-lived nuclides and 15 minutes in a flux of 10^{12} neutrons/cm^2/s and a decay time of 15 minutes for short-lived nuclides. It has been identified 21 elements : Al, Mn, I, Cl, Ba, K, Sc, Cr, Co, Rb, Sb, La, Ce, Eu, Tb, Lu, Hf, Ta, Th and Na, making use of a Ge(Li) crystal of 3.4 cc^3 planar. By chemical and spectral analysis, the following elements were determined : Cu, As, Pb, Mo, Ni, Fe, V, Zr, P and while silver by atomic absorption. It must be outlined the following conclusions :

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1. — The elements Mn, Ba, I, Cl, are more concentrated in the aerobe zone of lagoonar region (South of Danube Delta).

2. — The sediments taken from the anerobe zone of H_2S on the floor of the Black Sea, are more concentrated in lanthanides and other elements, except those mentioned at point 1.

3. — Ferromanganese concretions were lack in the Midwest basin of the Black Sea at 200 m depth.

Reference

[1] GEORGESCU (I.I.), LUPAN (S.), SĂLĂGEAN (M.) & OANCEA (M.), 1973. — On the chemical composition of Danube water, sea water, algae and sediments of the Black Sea, by analytical methods and instrumental neutron activation analysis. *Thallassia Jugoslavica (sous presse)*.