

GROSS ALPHA BETA RADIOACTIVITY IN WATER SAMPLES OF ALBANIA

Florinda Cfarku¹, Manjola Shyti²

¹ Institute of Applied Nuclear Physics, University of Tirana – P.O.Box 85 Tirana, Albania
Email: fcfarku@yahoo.com

² Institute of Applied Nuclear Physics, University of Tirana – P.O.Box 85 Tirana, Albania

Abstract

Radioactivity in drinking-water is principally derived from two sources: the leaching of radionuclides from rocks and soils and the deposition of radionuclides from the atmosphere. Naturally occurring radionuclides from both these sources account for almost the entire radioactivity present in Albanian drinking water. It is found in ground and surface waters and the reference level for concentration of ²¹⁰Po is 1 Bq/L in drinking water.

According to Albanian legislation the total alpha/beta screening was first carried out since it is a simple radioanalytical procedure, without regard to the identity of specific radionuclides. For total alpha and total beta radioactivity concentration exceeding the screening levels of 0.1 Bq/L and 1 Bq/L respectively, the determination of ²¹⁰Po activity concentrations were determined by alpha-spectrometry with low-level-activity silicon detectors. In the paper, a study of the ²¹⁰Po radioactive content of surface and drinking water in Albania was carried out.

The radiochemical separation procedure on large volume of water samples (10 L) was applied. The chemical yield (efficiency) of this procedure was controlled using a standard source of ²⁰⁹Po. The screening of total alpha and beta showed the activity concentrations ranging from 90 mBq/L to 170mBq/L and from 650 mBq/L to 1200 mBq/L respectively. The results obtained for ²¹⁰Po activity concentration range from 0.7 ± 0.08 mBq/L (Vjosa river) to 6.1 ± 0.5 mBq/L (Erzen river).

Keywords: *Gross Alpha-beta Radioactivity, Gas proportional counters, Alpha spectrometry, Radiochemical separation, Polonium isotopes.*