

THE LEVEL OF THE URANIUM, RADIUM, AND OTHERS RADIONUCLIDES CONCENTRATION IN OBJECTS OF ENVIRONMENT AND BIOOBJECTS IN POWERFUL INDUSTRIAL CENTER

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The problem of actinides and radionuclides migration, distribution, and concentration process in objects of environment and bioobjects stay of one of the importance and actual. There are the samples of drinking water, soil, roots, and the leaf of hydrophyte "Pistia stratiotes", the teeth of patients (72) with odontogenic inflammatory diseases, and patients' kidney stones (54) with urolithiasis treated. The samples were taken from Kharkiv's region. The determination of actinides and radionuclides content in samples was performed by gamma spectrometer method on Ge(Li)-detector with the volume of 50 cubic cm and resolution of 3.2 keV at 1332 keV line. To reduce the influence of background the detector is equipped with three-layer Pb-Cu-Al protection. Samples irradiated by bremsstrahlung from the linear accelerator electron with energy 23 MeV and current 500 micro A. Activation of samples carried out on air, the temperature of samples in the course of the activation didn't exceed 40 degrees C. The more significant error is for ^{238}U (line 186 keV is equal sums of the line from ^{226}Ra + ^{235}U). The errors of measurements were from 7 to 25%. The limit of detection elements for photoactivation analysis was 100-0.1 ppm. The ^{235}U and ^{226}Ra in the nuclear reaction were calculated with help of the program complex PENELOPA. In addition to gamma activation analysis, there was the method of IR-spectroscopy (the spectral range 4000-400 cm^{-1} regions) and crystal-optical investigation for determination of different chemical components, crystalline form, classification kidney stones, etc. in biological samples.

The whole samples contained ^{235}U , ^{238}U and ^{226}Ra . In drinking water, there are these actinides 1.2 - 1.8 ppm Bk/cubic dm. The actinides content in various types of soil has differences. There are radionuclides content in hydrophyte ^{40}K , ^{131}I , ^7Be , ^{228}Ac , ^{212}Pb , ^{137}Cs , ^{235}U , ^{226}Ra . It has been found that the accumulation of ^{226}Ra , ^{212}Pb , ^{214}Bi in the teeth with odontogenic pathology is 15-40 times higher than in the teeth of patients with the same pathology in other countries. For the samples of teeth and kidney stones, ^{235}U content was from 1 to 100 ppb.

The detected actinides and radionuclides confirm the influence of technogenic pollution of the ecosystem, as well as their geochemical mobility and biogenic migration.

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