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PAPER TITLE The Technique of the I-129 Amount Measurement in the Soil Samples Using Radiochemical and Neutron Activation Analysis.

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ABSTRACT (See instructions overleaf) The original technique of the I-129 amount measurement in the soil samples using radiochemical and neutron activation methods was developed in the IPPE. Its main stages are the following :

- isolation of iodine from a sample by extraction with transfer of iodine into PbI_2;
- sediment irradiation in a reactor channel in a flow of thermal neutrons not less then 4×10^{13} n/cm$^2\times$s for transfer of I-129 in I-130;
- repeated precipitation of PbI_2 in CuI_2 after irradiation for decrease of interfering elements contents (Na, Br, Sb and others) up to a acceptable level;
- measurement of I-130 activity on a gamma-spectrometer device with Ge-Li detector;

The technique was tested on the soil samples which were taken from different regions of Russia contaminated as a result of Chernobyl accident (Cs-137 surface contamination ranges from 5 up to 18 Ci/km^2), and also in the vicinity of nuclear installations (near Obninsk).

The technique permits to determine the I-129 amount in quantities up to 3×10^{10} nuclee/kg at the I-129/I-127 ratio not more then 10^{-12}.

The limits of the technique sensitivity permit to use it not only for the restoration of "iodine impact" characteristics in the first period after nuclear power plant accident but also for the I-129 measurement in global fallout as a result of nuclear weapon tests and registration, control and reconstruction of iodine fallout near nuclear power plants.