



Contribution ID: 284

Type: Oral

Determination of $^{238,239+240}\text{Pu}$, ^{241}Am , ^{244}Cm , ^{90}Sr and ^{137}Cs activities collected on dust masks during visiting Pripyat city using sequential radiochemical procedure

Eleven dust mask were obtained from tourists visiting Pripyat city (northern Ukraine) by one day in July 2016. For determination of ^{137}Cs , masks were placed in marinelli beaker and ^{137}Cs (661.65 keV gamma line) was measured directly using HPGe detector (Ortec GMX30 series). After gamma-ray measurements, masks were placed in oven and combusted. Ash after combustion was dissolved in concentrated nitric acid. Actinides ($^{238,239+240}\text{Pu}$, ^{241}Am , ^{244}Cm) and ^{90}Sr were extracted from sample matrix using ion exchange chromatography with Dowex 1x8, TEVA and Sr-Resin ion exchange resins. For measurements of $^{238,239+240}\text{Pu}$, ^{241}Am and ^{244}Cm activities, alpha spectrometry sources were prepared by microcoprecipitation with NdF_3 and were measured using silicon alpha particle detectors (Canberra P.I.P.S). For ^{90}Sr determination, sample was mixed with scintillating cocktail and measured on LSC spectrometer (Wallac).

Our measurements showed, that during visiting Pripyat city, tourist are inhaling radionuclides, which can be easily detected using low background radioanalytical methods. Obtained results were expressed by Bq per gram of aerosols deposited on filtrating material:

$0.295 \pm 0.027 \text{ Bq g}^{-1} \text{ }^{239+240}\text{Pu}$

$0.103 \pm 0.011 \text{ Bq g}^{-1} \text{ }^{238}\text{Pu}$

$0.395 \pm 0.043 \text{ Bq g}^{-1} \text{ }^{241}\text{Am}$

$0.037 \pm 0.006 \text{ Bq g}^{-1} \text{ }^{244}\text{Cm}$

$4.40 \pm 0.36 \text{ Bq g}^{-1} \text{ }^{90}\text{Sr}$

$11.6 \pm 0.9 \text{ Bq g}^{-1} \text{ }^{137}\text{Cs}$

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Track Classification: Applied Research