

Abstract

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Determination of Depleted Uranium Using High Resolution Gamma Rays Spectrometer and Applications in Soil and Sediments

High resolution gamma rays spectrometer of hyper pure germanium detector has been used to determine the depleted uranium in ground features subjected to military operations during Gulf war 1991 and in beach sediment samples collected from northern side of Arabian Gulf. The determination of $^{235}\text{U}/^{238}\text{U}$ has been evaluated using spiked samples with a series of depleted uranium solutions. According to this method it was found that the levels of depleted uranium should exceed 6.5% of total natural uranium to get reasonable levels for detection. Soil results showed the average of total radioactivity of ^{238}U is 50.59 Bq/kg and about 41.41% from this is depleted uranium. For on-site and off-site individuals in an area of 10000 m², RESRAD computer code has been applied to calculate the annual radiological dose, found 0.0031 mSv of total U, and to estimate the cancer risk, found 4.75×10^{-6} and 1.9×10^{-6} due to total U and DU, respectively.