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Radiological dose assessment of sludge samples collected from northern Iraq gas separation stations

We evaluate the activity concentrations (ACs) of various radioactive elements in the soil samples collected from seven petroleum gas separation stations located at Northern Al-Rumaila of Iraq. The baseline data from such soil samples are obtained to assess the health risks of the personnel working in such gas separation stations. Hyper pure germanium (HPGe) detector is used to measure the ACs of 232Th,226Ra, and 40K radioactive isotopes present in the sludge. The mean value of ACs of 232Th, 226Ra and 40K are found to be 592±30 Bq kg-1, 1042±46 Bq kg-1 and 325±22 Bq kg-1, respectively. The ACs for 232Th and 226Ra are discerned to be higher and for 40K it is lower than the world average. A correlation between the ACs of 226Ra and 232Th is established. The radiological hazard parameters mean outdoor annual effective dose, radium equivalent activity, external and internal hazard indices are found to be 1.046 mSv, 1914 Bq kg-1, 5.170 and 7.988, respectively. Based on the results it is asserted that some gas separation stations displaying excessive exposures to the onsite workers and local communities must be taken precautionary measure to avoid severe health hazards.

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