



Measurement of radioactive nuclides present in soil samples of district Tourij of Karbala province for radiation safety purposes

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Abstract : The study was conducted for the investigation of amount of radioactivity in the different Tourij region in Iraqi town in the province of Karbala, is located just 108 km to the southwest of the Iraqi capital Baghdad. The technique of gamma ray spectrometry was applied using NaI(Tl) gamma ray detector and a PC based Maestro Activity concentration levels due to ⁴⁰K, ²³⁸U and ²³²Th were measured in. Activity concentrations ranges of the concerned radionuclides for the soils were as follows: ⁴⁰K was (271.2-170) with the average (245.1), ²³⁸U, (30.96-5.86) Bq/Kg with the average (19.45)Bq/Kg, and ²³²Th, (67.09-2.9) with average(24.47) Bq/Kg respectively. The results have been compared with those of different countries of the world and Iraq. To assess the radiological hazard of the natural radioactivity, the absorbed dose rate, the radium equivalent activity (Raeq), the effective dose rate (Eeff), the annual effective dose equivalent (AEDE), Excess Lifetime Cancer Risk (ELCR), the radioactivity level index (I_γ), and the external (Hex) and internal (Hin) hazard indices were calculated. It can be concluded that no risk may threat the residents around and center of Holy shrines . Hence the probability of occurrence of any of the health effects of radiation is low. Hence, measurements have been taken as representing baseline values of these radionuclides in the soil in studying area.

Keywords: NaI(Tl)detector, natural radioactivity, ⁴⁰K, ²³²Th, ²³⁸U ,specific activity, soil.

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