Determination of natural radioactivity in building raw materials from the quarries of Assiut cement company, Assiut, Egypt

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Abstract:

By using gamma spectrometry (NaI (Tl) 3"x3"), the concentrations of (226Ra, 232Th and 40K) were measured and its radiological hazards were presented in this paper for some building raw materials (sand, clay and limestone) collected from the quarries of Assiut cement company, Assiut, Egypt. The concentration values of (226Ra, 232Th and 40K) were in between (3.6 ± 0.4 and 16.8± 1.4), (1.1 ± 0.2 and 11.9 ± 1.6) and (4.3 ± 0.3) and (155.2 ± 9) respectively. The radiation hazard indices like: Radium equivalent (Raeq), external hazard index (Hex), activity concentration index (Iex), the specific dose rates in door (D), the annual effective dose (DE) due to gamma radiation and the annual gonadal dose equivalent (AGDE) were calculated, it was below the world average value 300 Sv y⁻¹. The excess lifetime cancer risk (ELCR) have been calculated, its values were lower than the world's average value of (0.29 x 10⁻³) comparing with internationally recommended values.

Keywords:

Building raw materials; Activity concentration index; Dose rate; Annual effective dose

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