

Radiation exposure from floor tiles

The presence of radioactivity due to the presence of natural radio-nuclides in building materials can be a potential radiological hazard. During the recent years various new floor materials of both local and foreign origin have been used in office and house construction. This work presents an evaluation of the external gamma radiation exposure from natural radio-nuclides present in floor tiles at 1m height from ground level at the middle point of a standard room of 3mx3mx3.6m.

Seventeen samples of five different types of floor tiles were analysed by gamma spectroscopy. The measured activity concentrations for ^{40}K , ^{232}Th and ^{226}Ra ranged from 107-1780, 14-120 and 14-111 Bqkg^{-1} respectively. The lowest activity concentrations for all three radio nuclides were measured in marble tiles. Higher activity concentrations of ^{226}Ra were measured in granite tiles.

The annual effective gamma radiation dose to an individual with an occupancy factor of one calculated from granite, ceramic and marble floor tiles is 92,66 and 11 nSv respectively. Estimated absorbed dose rate in air within typical masonry dwellings is reported to be 80 nGy h⁻¹ (0.56mSvy⁻¹)⁻¹. This study suggests the exposure from the tested floor tiles to be insignificant. Such estimates would enable assessment of any possible radiation hazard and help to develop necessary standards for the use of building materials.