

International Conference on the Management of Naturally Occurring Radioactive Materials (NORM) in Industry

VIRTUAL EVENT

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Estimation of natural radioactivity in local and imported granite used as building materials in Tunisia

Measurements of natural radioactivity in local and imported samples of commercial granites used in Tunisia were carried out by using gamma-ray spectroscopy with hyper-pure germanium detector. The activity concentrations measured of granite samples were determined for ^{226}Ra (from 0.54 to 90.12 Bq.kg^{-1}), ^{232}Th (from 0.47 to 128.36 Bq.kg^{-1}) and ^{40}K (from 14.36 to 1792.08 Bq.kg^{-1}).

The corresponding average activity concentrations for ^{226}Ra , ^{232}Th and ^{40}K were 36.70, 62.16 and 1068.40 Bq.kg^{-1} , respectively. The radiological hazard parameters (radium equivalent, gamma index, external hazard index, internal hazard index, absorbed dose and annual effective dose) were calculated to assess the radiation hazards associated with granite samples. The annual effective dose values ranged from 0.01 in the sample (S1) to 1.8 mSvy^{-1} in the sample (S9). The international upper limit annual effective dose of 1 mSvy^{-1} is exceeded in some granites samples.

According to the obtained results, we can recommend that some of the granite samples are safe and can be used for building as interior decoration materials of the dwelling without any radiological complication. The obtained results are lower than the recommended limits; only eight granites samples have a higher value. The results were compared with the published data of other countries. The measurements will help in the development of standards and guidelines for the use and management of these materials.

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