

Abstract

Gamma spectroscopic analyses of sand and rock samples from Tyaa River report an average activity concentration of 33 ± 1 , 55 ± 2.8 and 812 ± 40.46 Bqkg⁻¹ for ²²⁶Ra, ²³²Th and ⁴⁰K, respectively in the sand. A similar analysis of rock samples reveals a mean of 21 ± 2.47 , 49 ± 2.47 and 782 ± 39.13 Bqkg⁻¹ for ²²⁶Ra, ²³²Th and ⁴⁰K, respectively. The absorbed dose rate in rocks averaged 75 ± 3.78 nGyh⁻¹, while in the sand was 86.2 ± 4.31 nGyh⁻¹. The ranges and mean radiological hazard indices (radium equivalent, internal and external) were within the permissible limits and the use of sand and rocks from this mine as construction material pose no health risks. Correlation analysis between the radioactivity in the sand and rocks reveals weak non-linear positive relationships suggesting that they might be from different bedrocks.