**Determination of natural radioactivity and the associated radiation hazards in decorated vitrified tiles collected from Tamil Nadu, India**

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Gamma ray spectrometry with NaI(Tl) detector was employed to determine the activity concentration of 226Ra, 232Th and 40K in vitrified tiles which has been used as modern building materials in Tamil Nadu. It is found that, 68 ± 5 Bq kg-1is a mean value for 226Ra, 116 ± 8 Bq kg−1 for 232Th, 540 ± 40 Bq kg−1for 40K and these mean values are greater than the world average value of 50, 50, 500 respectively as suggested by UNSCEAR 1993. This leads the average indoor gamma absorbed dose rate (84 nGyh–1) and excess lifetime cancer risk (2.13×10−3 mSv y-1) slightly greater than the world average value proposed by UNSCEAR 2000. This implied that, regular attention is necessary to use as building materials. In order to assess the distribution pattern of radionuclides in tiles, multivariate statical analysis was performed and it reveals no health hazards due to presence of 40K.

**Keywords:** Vitrified tiles, Gamma ray spectrometry, radiological hazards, statistical analysis.