

Radon Exhalation Rate Study of Sand Samples Collected from Sea Coast of Tirur, Kerala, India Using Track Etch Technique

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Abstract: The sand samples have been collecting from the sea coast (Unniyal beach) of Tirur of Malappuram district of Kerala state (India) by the grab sampling method. Radon exhalation rates have measured by “Sealed Can Technique” using LR-115 type II plastic track detector to estimate the health risk level in the environment. The value of radon activity varies from 444.44 to 2204.44 becquerel meter⁻³ (Bq m⁻³) with a geometric mean (G.M.)/standard deviation (S.D.) value of 1017.21 Bq m⁻³ /433.27. The value of mass exhalation rate for radon varies from 0.01 to 0.05 Bq kg⁻¹ h⁻¹ with a G.M./S.D. value of 0.024 Bq kg⁻¹ h⁻¹ /0.010. The value of area exhalation rate for radon varies from 0.27 to 1.33 Bq m⁻² h⁻¹ with a G.M./S.D. value of 0.62 Bq m⁻² h⁻¹ /0.26. The values of radon emanation ranged from 2.90 $\times 10^{-3}$ to 2.98 $\times 10^{-3}$ (%) with a G.M./S.D. value of 2.98 $\times 10^{-3}$ (%) /0.05. The alpha dose equivalent of the studied area is found and it varies from 0.68 to 1.66 milli sievert year⁻¹ (mSv yr⁻¹) with a G.M./S.D. value of 1.03 mSv yr⁻¹ /0.24. Good positive correlation is observed between the effective radium content and area exhalation rate for sand samples. Therefore, the obtained result shows that this region is safe as far as the health risk effects of radium and radon exhalation rate are concerned.