Statistical Distribution of Natural Radioactivity levels in Rajanna Sircilla District, Telangana State, India

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ABSTRACT

Radon and thoron are radioactive isotopes which generally originate in the nuclear decay of uranium and thorium and cause ionizing gas in living environments of human habitat. The assessment of natural radioactivity levels in the environs of radioactive anomaly is of most significance as the exposure to ionizing radiation leads to health hazardous issues. An attempt has been made to estimate the radon, thoron and natural background gamma radiation levels in the environs of Rajanna Sircilla district of Telangana State, India. The study area has been partially spread in Karimnagar granuilitic terrain (KGT) and also radioactive anomaly, identified in the earlier studies conducted by Atomic Minerals Directorate for Exploration and Research (AMDER) Hyderabad. The radiation measurements attempted in the study area comprise of 15 data samples at various locations covering all the seasons and dwellings with different building materials. The radon concentration has been observed tovary from 43 Bq.m^{-3}to 427 Bq.m^{-3} with an average of 130 ± 118 Bq.m^{-3}. Thoron concentration is found to vary between 6 Bq.m^{-3}and 143 Bq.m^{-3}with an average of 57 ± 47Bq.m^{-3}. The data acquired in the estimation of indoor radon and thoron levels is observed to follow lognormal distribution. The radiation levels measured in the dwellings of various types of building materials are analysed with multivariate statistical approach.

Keywords: Thoron, Radon, natural background gamma radiation, log-normal; Karimnagar; Twin chamber cup dosimeter.