World Academy of Science, Engineering and Technology
International Journal of Environmental and Ecological Engineering
Vol:9, No:06, 2015

Time Integrated Measurements of Radon and Thoron Progeny Concentration in Various Dwellings of Bathinda District of Punjab Using Deposition Based Progeny Sensors

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Abstract : Radon and thoron are pervasive radioactive gases and so are their progenies. The progenies of radon and thoron are present in the indoor atmosphere as attached/unattached fractions. In the present work, seasonal variation of concentration of attached and total (attached + unattached) nanosized decay products of indoor radon and thoron has been studied in the dwellings of Bathinda District of Punjab using Deposition based progeny sensors over long integrated times, which are independent of air turbulence. The preliminary results of these measurements are reported particularly regarding DTPS (Direct Thoron Progeny Sensor) and DRPS (Direct Radon Progeny Sensor) for the first time in Bathinda. It has been observed that there is a strong linear relationship in total EERC (Equilibrium Equivalent Radon Concentration) and EETC (Equilibrium Equivalent Thoron Concentration) in rainy season (R2 = 0.83). Further a strong linear relation between total indoor radon concentration and attached fraction has also been observed for the same rainy season (R2= 0.91). The concentration of attached progeny of radon (EERCatt) is 76.3 % of the total Equilibrium Equivalent Radon Concentration (EERC).

Keywords : radon, thoron, progeny, DTPS/DRPS, EERC, EETC, seasonal variation
Conference Title : ICEBESE 2015 : International Conference on Environmental, Biological, Ecological Sciences and Engineering
Conference Location : New York, United States
Conference Dates : June 04-05, 2015