

A Study of Indoor Radon, Thoron, Their Progeny Concentration Levels and Inhalation Dose in Dwellings of Different Districts of Punjab State, India

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Abstract : In the present study, indoor radon and thoron concentrations have been estimated using newly developed twin cup based pin hole dosimeter with single entry face in some areas of Punjab state, India. The equilibrium equivalent concentration (EEC) of radon and thoron has also been estimated directly by using progeny sensors, fabricated by BARC, India. Observed radon and thoron concentrations varied from 38.7 ± 5.79 to 98.7 ± 13.11 Bq/m³ and 25.38 ± 6.56 to 126.56 ± 14.23 Bq/m³ with an average value of 61.59 ± 8.11 & 70.89 ± 9.52 Bq/m³ respectively. Average equilibrium equivalent concentration of radon and thoron was 27.98 ± 4.66 & 2.24 ± 0.61 Bq/m³. Calculated equilibrium factor for radon and thoron was 0.467 and 0.034 in the present study. Annual inhalation dose calculated from the present observed concentrations, varied from 1.80 to 3.60 mSv/year with an average value of 2.52 mSv/year, which is well within reference level. It has been observed from the present study that thoron is a significant contributor to the inhalation dose which is about 25% of the total inhalation dose.

Keywords : radon, thoron, pin hole cup dosimeter, DTPS/DRPS, annual inhalation dose

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