MEASUREMENT OF RADON AND THORON ACTIVITY CONCENTRATION IN A LOCAL ENVIRONMENT

P. Mahawatte
Radioisotope Centre, University of Colombo.

A large proportion of the exposure to public from natural sources of radiation is due to indoor inhalation of the decay products of ^{222}Rn (Radon) and ^{220}Rn (Thoron) which are part of the ^{238}U and ^{232}Th series, respectively. The decay products of Radon and Thoron which are radioactive isotopes of solid elements, thereafter, get attached to nearby aerosol particles. When these aerosol particles are inhaled, a large percentage of them are collected by the walls and the membranes of the respiratory system, resulting in a large radiation dose to the bronchial epithella from the subsequent alpha particle emissions.

Activity concentrations of radon and thoron were determined in the University of Colombo from environments with different ventilation rates. Air was drawn through a glass fibre filter paper and alpha spectroscopy measurements were carried out on the aerosol particles collected. The concentrations of radon and thoron were estimated by the measurements of the accumulated activity of the decay products ^{214}Bi and ^{212}Bi respectively The activity concentration of Radon ranged from $< .03$ in outdoor air to 4 Bq/m^3 in poorly ventilated indoor areas. The activity concentration of the Thoron was found to be much less than that of Radon.

References:

UNSCEAR (1982) Ionizing Radiation:Sources and Biological Effects. United National Scientific Committee on the Effects of Atomic Radiation. 1982 Report to the General Assembly with Annexes.