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A03

DOSE ASSESSMENT DUE TO RADON EXPOSURE IN DWELLINGS, SCHOOLS AND KINDERGARTEN

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Radon concentrations measurements were performed in 40 dwellings, 35 elementary schools and 5 kindergartens in 3 municipalities in Republic of Macedonia by two types CR-39 nuclear track detectors. In the dwellings, the measurements were performed with detectors commercially named RSKS for one year period from June 2013 to May 2014 in the most occupied rooms of the buildings: living room or bedroom. The detectors type Gamma 1 were exposed for the same period in the kindergartens playroom or bedroom. The measurements in schools were performed in one classroom with paired Gamma 1 detectors. One detector was exposed during the same period as detectors in the dwellings and kindergarten and other in the period of the school year duration, starting September 2013 to May 2014. In order to check reproducibility of the results paired RSKS and Gamma 1 detectors were exposed in five schools. We accepted equality of the results at 95% confidence level.

The distribution of the measured data in all observed buildings was well fitted by lognormal function. The geometric mean values of radon concentrations obtained for dwellings (129 Bq/m^3), schools (127 Bq/m^3) and kindergartens (125 Bq/m^3) in these municipalities were higher than country average radon concentration (84 Bq/m^3) reported in national survey. Taking into account different occupation time the estimated annual effective doses due to radon exposure were found to be 3.3 mSv in dwellings, 0.8 mSv in kindergartens, 0.4 mSv for teachers in schools and 0.3 mSv for children in schools. We obtained that different exposure time of detectors in schools did not influence annual effective dose for teachers and children.

A04

RADON GENERATION AND DECAY FROM SOIL AND GROUNDWATER OF BUDHAKEDAR REGION, GARHWAL HIMALAYA, INDIA

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Radon enters in the environment through diffusion and transport from the soil and ground surface. Atmospheric radon is considered to be the most effective element of health risk. Diffusion of radon through soil is strongly affected by the degree of water saturation of the soil pores. This paper reports the radon emanation power of soil samples in Budhakedar area of Garhwal Himalaya, India. The formulations are applied to the experimentally measured radon data from soil of the study area. The estimated rate of generation and decay of radon in Budhakedar area ranges from 6.8×10^{-5} Bq.m^{-3}s^{-1} to 89.9×10^{-5} Bq.m^{-3}s^{-1} and 1.4×10^{-5} Bq.m^{-3}s^{-1} to 42.9×10^{-5} Bq.m^{-3}s^{-1}, respectively. The quantity of radon present in soil or in groundwater depends directly on trace concentration of radium in the earth's crust. It is observed that the total generated radon in soil of the earth crust is more than the decay of radon in the same medium. The generation and decay of radon can be described with the traditional single phase diffusion advection equation. Generated radon values are validated with the radon emanation rate measured by plastic track detector (LR-115 type II) technique for two different seasons of a year.

Keywords: Radon; Generation; Decay; Groundwater; Soil-Gas