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PRELIMINARY RESULTS FROM TIME INTEGRATED MEASUREMENTS CONCENTRATIONS OF INDOOR RADON, THORON AND THEIR PROGENIES IN SCHOOLS OF REPUBLIC OF MACEDONIA

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The results presented here are part of a survey on concentrations of radon, thoron and their progeny in different indoor environment of the Balkan region involving international collaboration. This paper presents the preliminary measurement results obtained in 43 schools of 5 municipalities in the Republic of Macedonia. The time-integrated radon and thoron gas concentrations were measured by CR-39 (placed in two chambers with different diffusion barrier), whereas the radon progeny and thoron progeny concentration (EECR and EECT) were measured by LR-115 nuclear track detectors based Direct Progeny Sensors (DTPS and DRPS).

The detectors were deployed at least 0.5 m distance away from the walls as well as away from windows and doors, in order to minimize the thoron concentration variations, and exposed over three-month period (March–May 2012).

The geometric mean values (and geometric standard deviations) of radon and thoron concentrations, EERC and EETC were: 76 Bq/m³ (1.7), 12 Bq/m³ (2.3), 27 Bq/m³ (1.4), 0.75 Bq/m³ (2.5), respectively. Equilibrium factors between radon and its progeny (F_{Rn}) and thoron and its progeny (F_{Th}) were evaluated: F_{Rn} ranges from 0.10 to 0.84 and F_{Th} ranges from 0.003 to 0.998 with geometric means (and geometric standard deviations) equal to 0.36 (1.71) and 0.07 (3.42), respectively. The linear regression analysis showed not significant correlation between the measured quantities. While the means appear plausible and well in line with values reported in literature, this is not so for some individual values. We discuss the technique and possible sources of errors and uncertainties.

Key words: Cr 39 detector, LR115 detector radon, thoron, radon progeny, thoron progeny, equilibrium factor

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