Evaluation of the radon exhalation rate and the radiological risk due to natural radioactivity content in the "Comiso stone" building material: a case study

Francesco CARIDI - *Dipartimento di Scienze Matematiche e Informatiche, Scienze Fisiche e Scienze della Terra (MIFT) Università degli Studi di Messina, Italy*

The radon exhalation from the "Comiso stone" building material, as well as its natural radioactivity content and thus the radiological health hazard for humans, were assessed and reported as a case study. In particular, the Closed Chamber Method (CCM) with the Durridge Rad7 setup and the High Purity Germanium (HPGe) gamma spectrometry were employed to quantify the radon exhalation rate and the activity concentration of 226Ra, 232Th and 40K, respectively. In addition, several indexes were calculated in order to assess the radiological hazard related to radiation exposure from the analyzed natural stone, i.e the absorbed gamma dose rate (D), the annual effective dose equivalent outdoor (AEDEout) and indoor (AEDEin), the radium equivalent activity (Raeq), the hazard indexes (Hex and Hin), the activity concentration index (I), and the alpha index (Iα).

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