DETERMINATION OF RADON CONCENTRATION AND EMANATION RATE IN SOIL USING CR-39 AND CRM SURROUND UITM JENGKA

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ABSTRACT

DETERMINATION OF RADON CONCENTRATION AND EMANATION RATE IN SOIL USING CR-39 AND CRM SURROUND UITM JENGKA

The determination of radon gas in the soil was performed using CR-39 and CRM to assess the radon concentration and emanation rate for the selected point in UiTM Jengka via the sealed container method and evaluating the radiological risk. The soil samples were collected from 10 coordinates inside the parameter of UiTM Jengka using GPS and transformed into loose powder samples. CR-39 and CRM were used to analyse the radon gas production in the samples while the primordial radionuclides were analysed using EDXRF. The radon concentration and emanation rate analysed using CR-39 varies between 45.5 – 156 Bqm^{-3} and 0.04 – 0.15 $Bqm^{-2}day^{-1}$ respectively. Meanwhile, the radon concentration and emanation rate analysed using CRM varies between -14.60 – 89.10 Bqm^{-3} and -1.05 x 10^{-6} – 6.39 x 10^{-6} $mBq/kg^{-1}hr^{-1}$ respectively. UJ1 was found to be in a high radon content while UJ8 has the lowest radon content. From the EDXRF analysis, the source of radon concentration in the soil samples were studied and the radiological risk has been assessed. Potassium-40 element did present in all samples while Thorium-232 partially present in some of the samples. However, Uranium-238 was not found in any of the samples. The soil samples from the selected points in UiTM Jengka does not exceed maximum world limit of dose rate. However, UJ1, UJ2, UJ4, UJ5 and UJ6 possessed a radiological risk as the external hazard index exceeds value of 1.