

## MEASUREMENT OF RADON ACTIVITY OF THE SPRING WATERS AROUND ORHANELI THERMAL POWER PLANT IN BURSA, TURKEY

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**Abstract.** In this study, the radon concentration measurements of the water samples collected from the natural water springs around Orhaneli Coal-fired Thermal Power Plant in Bursa were carried out using the RAD-7 electronic radon measurement device. The measurement results were compared with the data of the World Health Organization (WHO) and similar studies in the literature. The radon concentration in spring waters was found to vary from 0.724(2) to 69.442(9) Bq<sup>l</sup>-1. The annual effective doses due to ingestion of <sup>222</sup>Rn from the consumption of these waters were estimated to range from 1.27 to 121.52  $\mu$ Svy-1, from 1,32 to 126.38  $\mu$ Svy-1 and from 2,50 to 239,58  $\mu$ Svy-1, for adults, children and infants, respectively. The all dose results obtained for adults in the exception of one sample in this study indicate that the committed effective doses are below the WHO (World Health Organization) recommended reference level of 100  $\mu$ Svy-1.

## MONTE CARLO DETERMINATION OF DEAD LAYER EFFECT ON FEP EFFICIENCY OF GERMANIUM CRYSTALS

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As well known, High Purity Germanium (HPGe) detectors have a wide range of applications in every area where radiation detection and measurements are involved. One of the most important parameter in this respect is determination of the full energy peak (FEP) efficiency. There are certain parameters affecting the so called FEP efficiency of the germanium detectors one of which the dead layer thicknesses of the crystal itself. In the current study we determined the effect of the dead layer thicknesses of germanium crystal for the gamma energy values ranging from 30 keV to 2 MeV using Monte Carlo simulations with EGS4 system. It was found that when the front dead layer thickness increased FEP efficiency values decreased up to 500 keV energy value. Beyond 500 keV FEP efficiency stays almost constant even though the dead layer thickness further increased. It was also seen that the lateral and back dead layer thicknesses have no significant effect on FEP efficiency for the energy values considered.