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## Grain size effect on radon exhalation rate and uranium activity of Moroccan sediment

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Human is continuously exposed to ionizing radiation emitted from natural radioactivity. This later includes the cosmic radiation and the terrestrial radiation from the various radioelements ( $^{238}\text{U}$ ,  $^{235}\text{U}$ , and  $^{232}\text{Th}$  series) present everywhere in the earth's crust in varying amounts. This variation depends mainly on geological and geographical conditions and appears at different levels in soils from different geological regions. Radon gas is one of the decay products of these series. Once generated, it easily gets released from its birthplace to the pores space (emanation). Driven by various transport mechanisms, such as advection, convection or diffusion, it moves toward the surface and escapes to the atmosphere.

The present study investigates the granulation effect on the radon exhalation rates from a phosphate sample. The phosphate sample was sieved into different grain size dimensions ranging from  $< 0.063$  to  $> 2$  mm. The exhalation rate of each fraction was measured using the accumulation method. The radon exhalation rate was found to decrease with an increase in grain size above 0.125 mm. the influence of grain size on uranium content was also studied using the autoradiography method. The uranium concentration increased for the smallest grains ( $< 0.25$  mm), reached a maximum for the grains (0.25-0.5 mm), and decreased for the larger grains ( $> 0.5$  mm). The measured values of radon exhalation rates are under the limits reported worldwide.

Keywords: Radon exhalation; Grain size; Uranium content; Phosphate

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