Title

The design of a radon chamber for the calibration of radon monitors at the Centre for Applied Radiation Science and Technology, Mafikeng, South Africa.

Abstract

The aim of the study was to design a radon chamber for the calibration of radon monitors at the Centre for Applied Radiation Science and Technology. There are radon monitors in South Africa, however, there are no known calibration facilities in the country. Therefore, there is a need to design radon chambers. The radon chamber was designed with a Perspex material of thickness 6mm and of volume of 0.5 m^3 . Tudor-shaft soil samples whose ^{226}Ra activities were known were used as radon sources. Experimentally; radon concentration, humidity, temperature and pressure were measured with the AlphaGUARDs. The computed radon ingrowth activities were used as a standard for calibrating the experimentally obtained radon activities from radon monitors (AlphaGUARDs). The calibration factors for the experiment were the differences between the radon monitors and the computed radon ingrowth activities at equilibrium determined as 223.97 Bq and 339.83 Bq.

Keywords

Radon monitors, radon chamber, calibration, radon sources, radon ingrowth.

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