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Study about the radionuclides implanted on glass surfaces for the estimation of retrospective indoor radon concentrations

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ABSTRACT

Indoor radon retrospective dosimetry can be performed by measuring the ^{210}Po activity concentration deposited on surfaces. An experimental study about the implantation of ^{210}Po on mirrors exposed to radon has been performed. Two cases were studied: exposure to high and low ^{222}Rn concentrations. Results were compared with those calculated by using the activity evolution equations. Experimental results can be only explained assuming additional deposition of the long-lived ^{222}Rn descendants.

Keywords: Retrospective dosimetry; ^{210}Pb deposition on glass surfaces; past-radon concentration

1. Introduction

Retrospective dosimetry due to indoor radon exposure requires measurement methods which allow the determination of mean radon concentrations in the past (Alabanja et al., 1999). One of those methods is based on the direct measurement of ^{210}Po implanted on the surface of objects. The activity concentration ($\text{Bq}\cdot\text{m}^{-2}$) of this radionuclide is directly related to the cumulative exposure to ^{222}Rn ($\text{Bq}\cdot\text{m}^{-3}$) (Lagarde et al., 2002). These determinations are possible taking into consideration the equilibrium between ^{210}Po ($T_{1/2} = 138.4$ d) and its parent ^{210}Pb ($T_{1/2} = 22.3$ y). Decays of ^{222}Rn

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