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## CONVERSION FACTOR AND OTHER VARIABLES IN THE INDOOR RETROSPECTIVE RADON CONCENTRATION STUDIES

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Estimation of indoor retrospective radon concentration is a subject of primordial interest concerning cause-effect studies on the incidence of radon in public health. These studies can be performed by measuring the surface concentration of the radon progeny implanted on mirrors.

The conversion factor (relationship between the concentration of Po-210 on mirrors and the retrospective concentration of Rn-222 in the air) was analyzed under real environmental conditions in two places in a former work [1]. The Pb-210/Po-210 equilibrium on mirrors, also in two cases: exposure to high and low Rn concentrations, was also studied later [2].

Two new places, and new variables of interest, such as reproducibility, implantation with the exposure time, and cleaning of mirror surfaces, have been now considered. In the reproducibility studies, three mirrors were placed and removed simultaneously, after about two years of radon exposure. For the study of the implantation of radon progeny with the exposure time, five mirrors were placed simultaneously in a cave, and they were removed sequentially. Expositions were performed in places with moderate concentrations of  $^{222}\text{Rn}$ . The effects of cleaning the surface of mirrors have been considered to study the implantation depth of the recoiling nuclei.

The conversion factor  $\text{Po-210 (Bq/m}^2 \text{ on mirror surface) / Rn-222 (Bq/m}^3 \text{ on air)}$  for the four sites studied, has been estimated. Reproducibility of measurements has been proven. Dependence of concentration with exposure time has been checked. The effects of cleaning the surfaces have been studied. The results obtained for the possible  $^{210}\text{Pb-}^{210}\text{Po}$  equilibrium inside the mirrors have been also analyzed.

Some modelling taking into account theoretical considerations has been proposed in order to understand the mechanisms and variables producing the implantation of radon progeny on indoor mirror surfaces. Experimental results have been compared with those predicted by the model.

[1] Martín Sánchez, A., de la Torre Pérez, J., Ruano Sánchez, A.B. Experimental studies about the ratio between  $^{210}\text{Po}$  deposited on surfaces and retrospective indoor  $^{222}\text{Rn}$  concentrations. *Rad. Prot. Dosim.* 160, 206-209 (2014).

[2] Martín Sánchez, A., de la Torre Pérez, J., Ruano Sánchez, A.B. Study about the radionuclides implanted on glass surfaces for the estimation of retrospective indoor radon concentrations. *Appl. Rad. Isot.* 126, 13-15 (2017).

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