



EVALUATION OF PHOTON ENERGY AND ANGULAR RESPONSE OF EYE-D™ DOSIMETER

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Introduction: Interventional radiology involves considerable levels of exposure for occupationally exposed workers. Recent studies have shown the appearance of deterministic effects, such as cataract, in health workers exposed to annual doses below the equivalent dose limits recommended by ICRP. The objective of this work is to characterize an eyes lens dosimetry for the individual monitoring of workers exposed to high radiation values in the eyes lens by scattering effect of X-rays. For this purpose we measured the energy and angular response of the dosimeter for different quality values of X-rays and gamma radiation for the estimation of the magnitude Hp(3).

Material and method: We used EYE-D™ dosimeters containing a TL detector of LiF:Mg,Cu,P (model GR-200, made in China). The dosimeters were irradiated at the LSCD of the CPHR, placed on the ISO Water Slab Phantom, with Cs137, N60, N80, N100 of X-ray spectra at 0°, 60° and 120° as the angle between the radiation axis and the normal to the phantom's surface, as recommended in the IEC 62387: 2012 [1] and ISO 12794: 2000 [2].

The dosimeters were read in two automatic thermoluminescent readers, models RE-2000, marketed by the company Rados Technology OY (Finland) and controlled by computers, with their respective WinTLD software for dose calculation and data management.

Results: The obtained results confirm that the selected dosimeters meet the requirements proposed by the standard IEC 62387 for energy and angular dependence tests carried out, verifying the performance reported by the manufacturer [3].

Conclusions: It was verified that the response of the selected dosimeter, in terms of energy and angular dependence, corresponds to the information provided by the manufacturer and corroborated by other authors [4]. Its use is satisfactory to estimate the Hp (3) magnitude in eyes lens for the individual monitoring of the workers exposed to high radiation values in the eyes lens in Cuba.

References:

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