

COMPARATIVE EVALUATION FOR BARITE MORTAR ATTENUATION USING ISO RADIOPROTECTION QUALITIES

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The barite mortar, which is composed of cement, sand, water, barium sulphate, have been used widely in radiology facilities as shielding material for radiation protection purposes, as they present some advantages such as: high efficiency as attenuation materials, easy to handle application, easy availability in the domestic market and low cost. However, in practice the dimensioning of the mortar and the barite concrete used in plastering and construction of walls, respectively, is determined by the principle of equivalence of thickness in relation to lead or concrete. This procedure results in a overestimated dimensioning, given the possibility of occurrence of well significant errors, in function of the difference of specific density between lead or concrete and the barite. The main aim of this work is to characterize the barite mortars found in different regions of Brazil by measuring photons transmission. Plates of different thickness were fabricated by the manufacturer to test this research in the laboratory. The plates were irradiated with ISO X-ray beams (N60, N80, N110 and N150), generated by Pantak HF320 X-ray equipment, at the IPEN/CNEN laboratories and CRCN/CNEN, using X-ray spectrometry as well as measures of ionization chamber. It was also determined the HVL and the mean energy in this energy range. Results obtained in this work point out the importance of the knowledge of the X-ray spectra for accurate determination of ambient dose equivalent and effective dose values. The photons transmission is one of the used parameters for calculate the shielding material thickness. The authors are thankful to FUNDACENTRO, CNPq and IPEN. This work was supported by FAPEMIG and Ministry of Science and Technology - MCT/Brazil, through the Brazilian Institute of Science and Technology (INCT) for Radiation Metrology in Medicine