Calculation of the Energy Dependence of Dosimeter Response to Ionizing Photons

Using a program in BASIC applied to a desk-top calculator, simplified calculations provide approximate energy dependence correction factors of dosimeter readings of absorbed dose according to Bragg-Gray cavity theories. Burlin's general cavity theory is applied in the present calculations, and certain limitations of the theory are considered. Examples of the use of the program are given for 60Co γ-ray irradiation of a LiF dosimeter held in aluminum and for evaluation of the influence of changes in broad γ-ray spectra on the response of several dosimeters. The BASIC program and typical data plots as given here are available for certain dosimeter probe materials and combinations used with intermediate energy photon spectra (0.01–100 MeV).

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