

Thermoluminescence Dosimetric Characteristics of Fabricated Germanium (Ge) Doped Optical Fibres for Electron Beams Dosimetry: A Preliminary Study (Pencirian Dosimeter Pendar Gerlap Terma terhadap Gentian Optik Dop Germanium yang Difabrikasi bagi Pengukuran Dos dalam Pancaran Elektron: Sebuah Kajian Awal)

ABSTRACT

The basic dosimetric favourable responses of tailored fabricated germanium (Ge) doped cylindrical optical fibres, made of 2.3% mol have been extensively studied with clinical electron beams irradiation in terms of dose linearity, reproducibility, fading signals, minimum detectable dose (MDD), energy- and field size dependence. The irradiation was performed at the Radiotherapy Unit, Advanced Medical and Dental Institute (AMDI), which utilizes Elekta Synergy® linear accelerator (LINAC) at 6-, 9-, 12- and 15 MeV electron beam energies at specific doses ranging from 1 to 5 Gy. Thermoluminescence (TL) signals exhibited a linear dose-response over dose ranges, mean reproducibility with a coefficient of variation (CV) of better than 10% and no dependency with different field sizes at $p > 0.05$. The MDD values were typically 3.51 to 4.13 mGy. The minimum TL fading of the fabricated Ge-doped cylindrical optical fibres was reported favourably for 9 MeV electron beam at day of 74.

Keyword: : Dose linearity; optical fibres; thermoluminescence (TL)