AbstractID: 1292 Title: Two dimensional dosimetry in the near field of low energy photon emitting sources for interstitial brachytherapy using a thermoluminescent sheet

A themoluminescent (TL) sheet was used for 2-dimensional dosimetry measurements at submillimeter distances from a ^{103}Pd and two ^{125}I interstitial brachytherapy sources. The TL film is made of teflon homogeneously mixed with small particles of thermoluminescent material ($BaSO_4$: Eu doped). This TL sheet (5 cm x 5 cm) was used to determine the relative dosimetric characteristics, as defined by the updated AAPM TG 43 recommendations, of the model 200 ^{103}Pd, model 6711 and 6702 ^{125}I sources with a spatial resolution of 0.5 mm. The 2-D dosimetry data were obtained from the source surfaces to a distance up to 15 mm. The radial dose functions measured with TL sheet are in agreement within 11%, 10%, and 8% with the data recommended in the updated AAPM TG-43 report for the model 200 ^{103}Pd source, the model 6711, and model 6702 ^{125}I sources, respectively. The differences between the 1-D anisotropy function values measured with the TL sheet and the data recommended in the updated AAPM TG-43 report were 10% at 5 mm and 7.5% at 10 mm, respectively for model 200 ^{103}Pd seed. Those differences of the 1-D anisotropy functions measured with TL sheet and the established data at 1 cm from source center were 0.7% and 2.6% for model 6711 ^{125}I seed and model 6702 ^{125}I, respectively. Our experiments have shown that it is feasible to use the TL sheet as a dosimeter in the determination of the relative dosimetric characteristics at submillimeter distances from interstitial brachytherapy sources emitting low energy photons.