ON THE IMPACT OF THE PRE-IRRADIATION TLDs READOUT ON THEIR POST-IRRADIATION GLOW CURVES

ARAFA ABD EL-HAFEZ[1], NABIL EL-FARAMAWY[2], JEHAN FAHAD AL-SHAREEF[3] & SOAD EL-FIKI[4]

[1]Ionizing Radiation Metrology Laboratory, National Institute for Standards (NIS), Giza, Egypt

[2,4]Department of Physics, Faculty of Science, Ain Shams University, Abbassia, Cairo, Egypt

[3]Kingdom of Saudi Arabia, Riyadh

ABSTRACT

In this work the impact of reading out of the un-irradiated LiF TLDs based on the post irradiation readout was investigated. Four types of LiF detectors were used. The first three TLDs were MTS-N, MTS-6 and MTS-7 which differ only in the percentage abundance of Li^6 and Li^7 isotopes. The present results were discussed and compared with similar LiF (TLD-100, TLD-600 and TLD-700) fabricated by another company. MCP-N LiF dosimeters were also studied and compared with similar detectors of different only in the doping materials. The current results indicated that all of the LiF doped with Mg and Ti detectors were affected dramatically by the pre-irradiation readout process regardless of the fabrication companies. Otherwise, the impact of different doping materials was contradictious. These dramatic changes could be attributed to the occurrence of the nonradiative recombination through the irradiation process which yield high temperature peaks in the glow curve of the investigated LiF: Mg,Ti in contrary to LiF: Mg,Cu,P detectors.

KEYWORDS: Zero Dose Readout, Pre-Irradiation Heat Treatment, Thermoluminescence, LiF:Mg,Ti, LiF:Mg,Cu,P