MEH-PPV Thin Films for Radiation Sensor Applications

Dayana Luiza Martins Bazani, John Paul Hempel Lima, and Adnei Melges de Andrade

Abstract - This work deals with MEH-PPV thin films to be used as gamma radiation sensors. The polymer thin films with two different thicknesses (30 and 100 nm) were irradiated at room temperature with different gamma radiation doses (up to 25 kGy). Optical properties of the material were investigated with FTIR and UV-Vis absorption spectroscopy. Results show that gamma radiation does not degrade substantially the thin-film material, suggesting that a crosslink effect may be occurring. The characteristic absorption peak of MEH-PPV, around 500 nm is shifted to shorter wavelengths with the increase of gamma radiation doses for both thicknesses samples. The 30-nm-thick samples showed a larger variation absorbance at a specific wavelength and a larger peak shift. These results indicate their potential for use in monitoring the radiation doses used on the sterilization of health care products.

Index Terms - Conducting polymers, gamma radiation, MEH-PPV and optical sensor.