



Dose-Dependent Effect of Gamma Radiation on Structural, Thermal and Electrical Properties of Lexan Polymer

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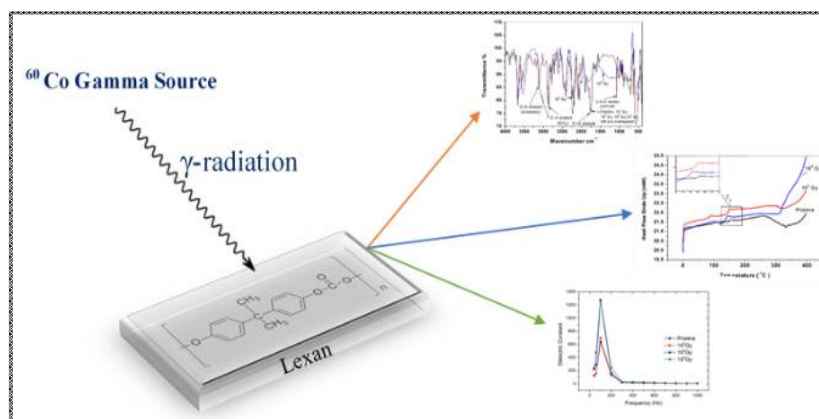
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ABSTRACT

Lexan polymer was irradiated with gamma radiation of 10^1 - 10^6 Gy dose with a ^{60}Co gamma source having a dose rate of 3k Gy h^{-1} at room temperature. The structural, thermal and electrical properties of Lexan polymer irradiated with gamma radiation had been investigated using different analytical techniques. FT-IR studies evidences chain scission and cross-linking at higher gamma dose. TGA and DSC studies reveal that due to gamma exposure, the polymer loses its weight in a single step pattern in comparison to a double step decomposition pattern observed for pristine polymer. Glass transition temperature of the polymer was also found to follow a decreasing order from 150°C to 140°C with increasing gamma dose. Dielectric constant was found to be much higher for their radiated samples in comparison to the pristine Lexan polymer at lower frequency.

Graphical Abstract



Keywords: FT-IR, Gamma Dose, Glass Transition Temperature, Dielectric constant