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XRD, SEM, FTIR and DSC studies on PMMA and PEG polymer blend films

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Abstract: Films of Poly (methyl methacrylate) (PMMA), poly (ethylene glycol) (PEG) and blend of these two polymers (PMMA and PEG) have been prepared by using well known solution casting method. The complexation of the prepared polymer blend films has been confirmed by recording the X-ray diffraction (XRD) spectra on these samples. Sharp peaks of the XRD patterns appear at 21.8^0 and 23.4^0 which indicate that the PEG was completely crystallized during the polymerization process. The humps around 14.2^0, attributed to the poorly crystallized PMMA. The surface morphology was examined by Scanning Electron Microscopy (SEM). The FTIR spectra of polymer blend PMMA+PEG have showed several changes in the absorption band positions compared to pure PMMA. As a result, the FTIR analysis confirmed the constitution of both the blend components and the possible interaction between the components. The DSC studies indicated the melting temperature (Tm) and heat flow. The pure PMMA has the broad melting temperature around 152^0C. Meting temperatures (T_m) of PMMA+PEG blend with different ratios are observed to be decreased when compared to pure PMMA.

Keywords: *Polymer blend, PMMA, PEG, XRD, SEM, FT-IR, DSC.*