



Property modification by full IPN formation with PVC and PBA

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Abstract: Poly(vinyl chloride) (PVC) and (polybutyl acrylate) (PBA) polymers are blended to form a full interpenetrating network (IPN) using diallyl phthalate (DAP) and ethylene glycol dimethacrylate (EGDM) as the crosslinkers of the polymers respectively. Four distinct sets of full IPNs were prepared by varying the composition ratios. PVC, mixed with plasticizer dioctyl phthalate (DOP) and heat stabilizer tribasic lead sulphate (TBLS), alongwith monomer butyl acrylate and initiator benzoyl peroxide (Bz_2O_2). DAP and EGDM were added to the polymers PVC and PBA which acted as their crosslinkers respectively. The powdery mix was compression moulded under heat and pressure to allow simultaneous polymerization and cross linking. The samples formed were characterized with respect to their physico-mechanical, thermal and morphological properties with respect to the unmodified base reference PVC compound. The rubbery nature of the modifying resin PBA had an influential effect in modifying the properties of PVC. There was an initial fall up to 10% PBA incorporation in tensile strength followed by a rise nearly up to the original strength of PVC. There was also a significant rise in percentage elongation at break and toughness over unmodified PVC followed by a rise in thermal stability of the samples as shown in the thermomechanical and differential scanning calorimetric studies. Morphologically, the scanning electron micrographs corroborates with the trend in mechanical changes as observed.

Keywords: Poly(vinyl chloride), poly(butyl acrylate), mechanical properties, thermal properties, morphology.

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