



EFFECT OF THE PRESENCE OF FUNCTIONALIZED GRAPHENE SHEET ON THE PHASE SEPARATION OF PAMSA/PMA BLENDS

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Effects of the presence of functionalized graphene sheets (FGS) on the thermodynamics and kinetics of phase separation in an LCST-type blend have been investigated systematically. The phenomena have been characterized by melt-rheology as the system passes through the binodal and the spinodal lines of the phase diagram. The FGS were incorporated in the one phasic material by solution mixing. The composite samples were then allowed to phase separate in situ by elevating the temperature. Evolution of the moduli as a function of temperature and time was used as a probe to investigate the thermodynamics and kinetics of phase separation respectively. It was observed that FGS significantly influences both the phase separation temperature and the shape of the phase diagram. Furthermore, FGS was found to act as a retarder for the phase separation process. The state of dispersion of FGS in the blends was assessed using conductivity spectroscopic measurements. Interestingly, at room temperature the mono-phasic composite samples were virtually insulators whereas highly conducting materials were obtained as a result of phase separation in the bi-phasic materials. These phenomenon offer routes to tailor material properties for a wide range of potential applications.