

Maleic acid-alt-styrene copolymer as compatibilizer for poly(ethylene oxide)-poly(styrene) blends

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Maleic acid-alt-styrene (MAaS) copolymer with number-average molecular weight $M_n = 2500$ was used as a compatibilizer in blends of poly(ethylene oxide) (PEO) and poly(styrene) (PS). PEO with weight-average molecular weight $M_w = 105$ (PEO100) and two PS samples with $M_w = 9 \times 10^4$ and 4×10^5 , respectively (PS90 and PS400, respectively) were used. A depression of the melting temperature T_m of PEO in blends containing MAaS relative to pure PEO and PEO/PS blends was observed. The melting enthalpy ΔH_m for the PEO/PS blends containing MAaS was lower than those of pure PEO and PEO/PS blends without compatibilizer. The crystallization kinetics of PEO and the blends were studied by differential scanning calorimetry (DSC) at different crystallization temperatures T_c . Flory-Huggins interaction parameters χ_{12} for the blends were estimated. Their values are in good agreement with those obtained for similar systems and suggest that the free energy of mixing ΔG_{mix} should be negative. Polarized optical mi