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Thermodynamic Interactions in Model Polyolefin/Polydiene Blends[1] JIALIN QIU, KATRINA MONGCOPA, RUIXUAN HAN, Univ of Houston, CARLOS LPEZ-BARRN, ExxonMobil Chemical Company, MEGAN ROBERTSON, RAMANAN KRISHNAMOORTI, Univ of Houston, EXXONMOBIL CHEMICAL COMPANY COLLABORATION — The Flory-Huggins interaction parameter χ is used to describe the interactions between polymers and is of crucial importance in determining the processing conditions for polymer mixtures and block copolymers. The temperature dependence of χ between 1,2-polybutadiene and saturated 1,2-polybutadiene was investigated. 1,2-Polybutadiene was synthesized by anionic polymerization with 1,2-dipiperidinoethane as an additive to achieve high vinyl content (99.0%). The synthesized 1,2-polybutadiene was saturated with deuterium to provide contrast for small-angle neutron scattering (SANS) experiments. Two series of blends were prepared with differing molecular weight. Values of χ were extracted from fitting the Random Phase Approximation (RPA) to SANS data. Additionally, χ was extracted from Zimm analysis, using the low-angle scattering intensity. χ extracted by RPA and Zimm analyses were in good agreement. The temperature dependencies of χ characterized for two separate blends of differing molecular weight were consistent with one another. The large χ parameter observed in this system indicates strong repulsion in blends of polydienes and polyolefins.

[1]ExxonMobil Chemical Company

Jialin Qiu
Univ of Houston

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