

Abstract Submitted
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Styrene-

Isoprene-Styrene Triblock Copolymer (SIS)/Polydiphenylamine Blends for Actuator Application KRAIPOP THONGSAK, ANUVAT SIRIVAT, The Petroleum and Petrochemical College — Styrene-Isoprene-Styrene triblock copolymer (SIS) is a dielectric material exhibiting many properties similar to polyisoprene elastomer, which has been widely studied for electroactive applications. In our work, SIS films were prepared via film casting at various polystyrene (PS) contents (19 wt %, 29 wt %, and 44 wt %), yielding three different morphology films as characterized by an optical microscope, SEM, and TEM. Polydiphenylamine (PDPA), a conductive polymer, was synthesized by the oxidative polymerization and doped with HCl. For electroactive applications, electrorheological properties of pure SIS films and SIS/PDPA blends under stretching at a fixed temperature of 25°C were measured to determine the effects of morphology (spherical, cylindrical, and lamella morphology), particle concentration, and doping level on the electrorheological properties measured: the storage and the loss moduli (G' and G''), the storage modulus responses ($\Delta G'/2\text{kV}/\text{mm}$), and the storage modulus sensitivities ($\Delta G'/2\text{kV}/\text{mm}/G'_0$), under applied electric field strength varying from 0 to 2 kV/mm.

Anuvat Sirivat
The Petroleum and Petrochemical College

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