Synthesis of branched block copolymer via dual polymerization method

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This research describes a facile synthesis of branched block copolymer combined a conjugated polymer, poly(thiophene) as a main chain with either poly(styrene sulfonate) or poly(methacrylic acid) as a branched polymer via oxidative polymerization and atom transfer radical polymerization (ATRP). Especially, the copper metal catalyst (Cu2+) plays a pivotal role in a dual polymerization process because of its mild oxidative potential as well as coordinate bond with a ligand for ATRP. Structural analysis of Poly(thiophene)-b-poly(styrene sulfonate) and poly(thiophene)-b-poly(methacrylic acid) were investigated by Nuclear magnetic resonance (NMR) and Fourier transform infrared spectroscopy (FT-IR). And their fluorescence properties and morphologies are measured from UV-vis/PL spectroscopy and Transmission electron microscopy (TEM), respectively. In addition, the morphology of the synthesized copolymers were changed by using various solvents dependent on different solubility parameters