Preparation of Core-Shell Poly(Styrene/Thiophene) Latex Particles via Oxidative Polymerization in Seed Emulsion Polymerization

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PTs are one of the most studied and important classes of linear conjugated polymer because they can easily produce a red color that is difficult to achieve with other conjugated polymers. However, the price of substituted polythiophene is very high. It becomes one of the most critical drawbacks for making a big particle. To overcome this drawback, we make a big particle using seed emulsion polymerization. The second-stage monomer is polymerized via oxidative polymerization in the presence of the core seed latex, which can either be prepared beforehand in a separate step during emulsion polymerization. we introduce luminescent polymer onto a cheap monodisperse polystyrene nanoparticles surfaces. As size of polystyrene particle changes, size of core-shell polymer particle controls easily. And size of core/shell particle increases with the amount of polymerized monomers in seeded polymerization. Core/shell morphology of composite particles is observed under TEM, and incorporation of PT onto PSt seed particles confirms by FT-IR.