

### One-step Synthesis of Polystyrene/Polythiophene Core/Shell Nanoparticles via Dual Initiation System

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Polystyrene-polythiophene (PSt-PTh) core-shell nanoparticles were synthesized via surfactant-free emulsion polymerization with oxidative initiation. As a couple agents, hydrogen peroxide ( $H_2O_2$ ) and ferric chloride ( $FeCl_3$ ) were used to carry out dual initiation system. The average particle size of the particle was approximately 300 nm and its core-shell morphology was proved by backscattered SEM imaging. We proposed a growth mechanism for the formation of the core-shell PSt-PTh particles based on the time-evolution morphology of the particle with SEM images. The result was also corroborated by the time-evolution in situ FT-IR and  $\xi$ -potential data. The optical property of core-shell particles was analyzes by photoluminescence spectroscopy.