

Control the Particle Size and Electrical Properties of Polypyrrole by In-situ Doping Oxidative Polymerization in Acidic Conditions

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Among the conducting polymers, polypyrrole(Ppy) has attracted great attention because of its high electrical conductivity and good environmental stability. Ppy has been considered as the key material to many potential applications. In this study, Ppy nanoparticles were prepared using poly(styrene sulfonate) (PSS) as a polymeric surfactant by in-situ doping oxidative polymerization in acidic medium. PSS formed aggregates like a stabilizer of emulsion system in acidic medium. The species and concentration of acid and oxidant have been carefully investigated to optimize the polymerization, conjugated structure, size, and conductivity of the Ppy nanoparticles. The particle size of Ppy nanoparticles was adjusted by concentration of acid. Conducting thin film based on Ppy particles was prepared on glass. After coating process, conducting properties were characterized by 4-probe meter. Ppy nanoparticles can be applying to electrical devices such as capacitors, electrostatic discharge, solar cell, OLED and transistor.