Effects of Surfactant Type in Preparing Polypyrrole Nanoparticles

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Polypyrrole (PPy) is an organic conducting polymer with promising applicability in fabrication of composite materials and biosensors. In this study, properties and shape of colloidal PPy nanoparticles were investigated with the variance of surfactant type. Colloidal PPy nanoparticles were synthesized in an aqueous solution using cationic surfactant of tetra dodecyl trimethyl ammonium bromide(TTAB) and anionic surfactant of sodium dodecyl sulfate(SDS), respectively. Well-dispersed spherical PPy nanoparticles were obtained in the presence of cationic surfactant, while aggregated structures were formed when anionic surfactant was used. In addition, the final shape was guided by the addition sequence of the reactants. These results suggest that the charge of surfactant strongly affected the final morphology as well as the physical properties of PPy nanoparticles.