

Luminescent Gold-Poly(thiophene) Nanoaggregates by a One-step Oxidative Polymerization

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This article describes the synthesis and photo-luminescent properties of the gold-polythiophene (Gold-PTh) nanoaggregates that prepared by one-step oxidative polymerization. The morphology was studied by transmission electron microscopy (TEM) and high resolution transmission electron microscopy (HR-TEM). Morphology indicates that the PTh covered gold nanoparticles was aggregated to form a three dimension architecture. The nature of surface interactions and energy transfer interactions were studied using X-ray photoelectron spectroscopy (XPS) and UV-vis absorbance spectroscopy. Nanoaggregates exhibit energy transfer, surface plasmon resonance effects between the gold nanoparticles and polythiophene. This surface plasmon resonance effects contributes to enhance the photoluminescence (PL) of the Gold-PTh nanoaggregates compared to the PTh nanoparticles, which was analyzed by spectrofluorophotometer and laser confocal microscope in solid state.