

Abstract Submitted
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Synthesis and Characterization of Gold-Titanium Dioxide Nanoparticles HAILEY CRAMER, ISMAT SHAH, University of Delaware — Nanoparticles are of recent scientific interest due to their unique size-dependent optical, electrical, and catalytic properties. Gold nanoparticles specifically, have many potential applications, especially in optoelectronic devices due to their optical properties and plasmon resonance. The specific goals of this research are to synthesize Au/TiO₂ core-shell nanoparticles for their use in improving the overall efficiency of P3HT/PCBM polymer solar cells previously prepared in our lab. The standard sodium citrate reduction method was used to synthesize gold nanoparticles with an average diameter of 15 nm. Through changing the concentration of sodium citrate in solution we were able to tune the size of the nanoparticles, and therefore change their light-absorbing properties. The goals of this research are to cap the gold nanoparticles with TiO₂ through a sol-gel method. Characterization of the Au/TiO₂ particles will be performed using high resolution tunneling electron microscopy to determine the size of the nanoparticles and the thickness of the TiO₂ shell. In addition, ultraviolet-visual spectroscopy was used to determine the absorption of the particles, and dynamic light scattering was used to confirm the size distribution of the particles. The incorporation of Au/TiO₂ nanoparticles in P3HT/PCBM devices will be discussed.

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