

Photosensitization of nanostructured TiO₂ films with CdSe Quantum Dots

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In the present study, we have assembled CdSe nanoparticles on TiO₂ surface with a bifunctional surface linker. Mercaptopropionic acid having two reactive groups (-SH and -COOH groups) serves as a good linker molecule to assemble gold (or CdSe) nanoparticle on nanostructured TiO₂ surface (Figure 1).

Figure 2 shows absorption spectra of TiO₂ films modified with 4 nm CdSe quantum dots. Visible excitation of CdSe/TiO₂ films in a photoelectrochemical cell exhibit photocurrent generation indicating photoinduced charge transfer between the two semiconductor nanostructures. Spectrochemical and photoelectrochemical measurements that demonstrate the role of gold nanoparticle as a charge-transport mediator in such superstructures will be discussed.

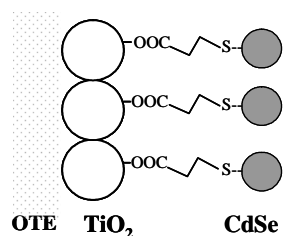


Figure 1. Semiconductor-metal based nanoassembly on electrode surfaces.

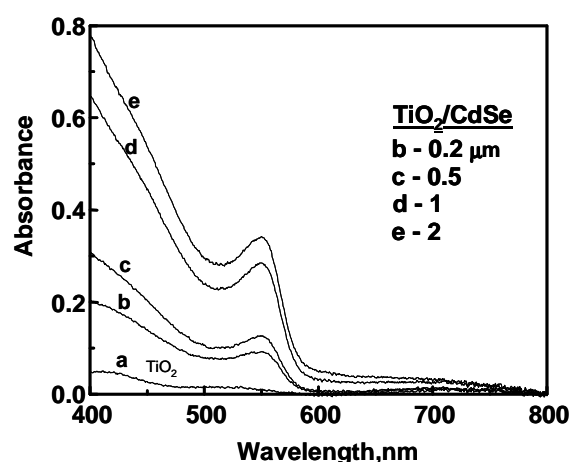


Figure 2 Absorption spectra of TiO₂ films modified with CdSe quantum dots. Increased absorption corresponds to increasing amount of CdSe binding to thicker TiO₂ films.

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