

Hybrid sensitized semiconductor solar cells

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The emergence of quantum dot-sensitized solar cells (QDSSCs) has provided an alternative way to harvest sunlight for energy conversion. Semiconductor quantum dots (QDs) have been drawing great attention recently as a material for solar energy conversion due to their versatile optical and electrical properties. The QD-sensitized solar cell (QDSC) is one of the burgeoning semiconductor QD solar cells that shows promising developments for the next generation of solar cells.

For fabrication solar cell were chosen nanodimension metal oxides (such as TiO_2 and SnO_2) due to their value of band gap. A thin film of semiconductor nanoparticles was applied on the ITO-glass surface by simply application of colloidal solution. After the film had formed on the surface, it was sensitized by organic dye or CdTe quantum dots. The most common type of electrolyte is an organic solvent containing redox couples $\text{I}^- / \text{I}_3^-$. The photocurrent in solar cells can be produced from the drift of electrons in an electric field, and also from the diffusion of photocarriers.