

염료감응 태양전지의 원리와 전망
Dye-Sensitized Solar Cells: Principle and Perspective

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Dye-sensitized solar cell utilizing nanotechnology and photosynthesis attracts much attention due to its high solar-to-electricity conversion efficiency and low cost. This cell is based on high surface area nanostructured oxide film that is sensitized with dye molecules, which renders high solar-to-electrical energy conversion efficiency. Absorption of visible light by the dye leads to electron injection from the excited dye molecules to the conduction band of TiO_2 via metal-to-ligand charge transfer process. The photo-injected electrons travel through the porous TiO_2 network to the conducting oxide layer, thereby photocurrent is generated. The oxidized dye molecules are regenerated by iodide in the electrolyte, and the oxidized triiodide is reduced at the metal counter electrode to complete overall process. In this talk, operation principle of dye-sensitized solar cell will be presented as well as its perspective.