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RECENT PROGRESS IN DYE SENSITIZED SOLAR CELLS

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ABSTRACT II:

The DSC architecture is broadly composed five components: (1) a mechanical support coated with a transparent conductive oxide (TCO); (2) the semiconductor film, usually TiO₂; (3) a sensitizer adsorbed on the surface of the semiconductor; (4) an electrolyte containing a redox mediator; (5) a counter electrode capable of regenerating the redox mediator. Sunlight is absorbed by a dye monolayer located at the junction between an electron and hole transporting phases where the former is a wide band gap oxide semiconductor and the latter is typically the iodide/triiodide redox (I⁻/I₃⁻) system. The photo-generated charge carriers then travel through the nanostructures to be collected as current at the external contacts. Optimization of the device can therefore be done by separately not only modifying the dye alone to optimize the spectral properties, but also by optimizing the semiconductor and the electrolyte composition. This talk will present recent progress and strategies to improve the performance in DSC.