Dye Sensitized Photocathodes

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This presentation will highlight recent work by our research group in the realm of semiconductor (photo)electrochemistry for solar energy conversion systems. A general and brief overview/motivation for dye-sensitized semiconductors in energy conversion applications will first be given. The remainder of this talk will then focus on our efforts to design and utilize sensitized p-type phosphides as light harvesting materials. Experimental and modeling data germane to the assembly of phosphide-based dye-sensitized solar cells featuring efficient sensitized hole injection will be presented. The discussed system relies on the presence of an internal electric field and represents an alternative to the traditional 'Gratzel' design for dye-sensitized photoelectrochemical cells. Data will be shown that describe the operational features of such photoelectrodes and methods to enhance their stability, activity, and operation.