

Photoelectrochemical Water Splitting and CO<sub>2</sub>  
Conversion for Solar Fuels

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As the costs of carbon-footprintd fuels grow continuously and simultaneously atmospheric carbon dioxide concentration increases, solar fuels receive growing attention as alternative clean energy carriers. These fuels include molecular hydrogen and hydrogen peroxide produced from water, and hydrocarbons converted from carbon dioxide. For high efficiency solar fuel production, not only light absorbers (oxide semiconductors, Si, inorganic complexes, etc) should have high absorption properties but also charge separation and transfers need to occur effectively. With this in mind, this talk will introduce the fundamentals of solar fuel production and artificial photosynthesis, and then discuss in detail on the photoelectrocatalytic water splitting and CO<sub>2</sub> conversion using photoanode-photocathode tandem cells.