Abstract Submitted
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The Dye Sensitized Photoelectrosynthesis Cell (DSPEC) for Solar Water Splitting and CO2 Reduction[1] THOMAS MEYER, LEILA ALIBABAEI, BENJAMIN SHERMAN, MATTHEW SHERIDAN, University of North Carolina at Chapel Hill, DENNIS ASHFORD, Eastman Chemical, ALEX LAPIDES, KYLE BRENNAMAN, ANIMESH NAYAK, SUBHANGI ROY, KYUNGRYANG WEE, MELISSA GISH, JERRY MEYER, JOHN PAPANIKOLAS, University of North Carolina at Chapel Hill — The dye-sensitized photoelectrosynthesis cell (DSPEC) integrates molecular level light absorption and catalysis with the bandgap properties of stable oxide materials such as TiO2 and NiO. Excitation of surface-bound chromophores leads to excited state formation and rapid electron or hole injection into the conduction or valence bands of n or p-type oxides. Addition of thin layers of TiO2 or NiO on the surfaces of mesoscopic, nanoparticle films of semiconductor or transparent conducting oxides to give core/shell structures provides a basis for accumulating multiple redox equivalents at catalysts for water oxidation or CO2 reduction.

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