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Abstract Title: Metal Oxide Nanorod Photoelectrochemical (PEC) Cells for Hydrogen Generation from Water Splitting

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Short Description: ***(approximately 100 words)***

In our work we study the photoelectrochemical (PEC), photophysical and morphology properties of n-type 1-D ZnO, TiO2 and WO3 nanorods on conducting substrates for hydrogen production. Essential photoelectrochemical (PEC) water splitting properties include resistance to photocorrosion, good charge transport, and proper valence/conduction band positioning. Aligned and dense 1-D nanorod arrays were produced by oblique angle deposition (OAD) and glancing angle deposition (GLAD). Vectorial charge transport through the nanorod is found to increase the collection of photogenerated carriers. Extension of the photoresponse into the visible region was performed by nitrogen doping in an ammonia atmosphere. Intelligent design of the length and width allows for good charge separation of photogenerated carriers due to the inherent space charge region at a semiconductor-electrolyte-interface (SEI).

Talk Summary:

Brief introduction of alternative energy and challenges facing hydrogen generation. Description of the properties inherent in n-type metal oxide photoelectrochemical cells in aqueous electrolytes. Next, an emphasis on the various space charge regions (Schottky barrier) such as the depletion and inversion layers at SEI and how to exploit it successfully. OAD and GLAD tecghniques will be elucidated upon and the theory that allows for the creation of 1-D nanostructures. A succession of the data collected would follow, detailing the PEC, photophysical and morphological properties of our metal oxide systems. I would then report the photon-to-hydrogen generation efficiencies, and possible routes for improving them. A summary and conclusion slide would then end the talk.

List of figures: 1.UV-vis absorption spectra 2. XRD data 3. SEM/HRSEM data 4. EDS data. 5. PEC data.
