The preparation and photocatalytic water splitting of NdVO$_4$-V$_2$O$_5$ powders

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The NdVO$_4$-V$_2$O$_5$ powders were synthesized by neodymium nitrate and ammonium metavanadate using the glycothermal method in ethylene glycol at 120°C for 1h. When NdVO$_4$-V$_2$O$_5$ hybrid powders soaked in light that generate electron and hole than charge separation and migration to the surface of NdVO$_4$-V$_2$O$_5$ hybrid powders, which of the valence band are below the water oxidation potential (1.23 V versus NHE at pH 0). The results indicated that the holes of NdVO$_4$-V$_2$O$_5$ hybrid powders can oxidize water molecules to form oxygen as shown in Fig. 1. However, the conduction of hybrid powders was perhaps lower than the water reduction potential 0V that caused electron of hybrid powders can not reduce H+ to form hydrogen or sacrificial agent solution (10% methanol). Based on the stoichiometry of NdVO$_4$, the oxidation states and atomic orbitals are given by Nd$^{3+}$(6s$^2$4f$^4$), V$^{5+}$(3d$^0$), and O$_2$–(2p$^6$). The valence band is formed by coupling Nd6s and O 2p orbitals while the conduction band is primarily controlled by V 3d orbitals, with contributions from the O 2p and Nd4f orbitals.

Biography
Deanna Mulvihill has her expertise in evaluation and passion in improving the health and wellbeing. Her open and contextual evaluation model based on responsive constructivists create new pathways for improving healthcare. She has built this model after years of experience in research, evaluation, teaching, and administration both in hospital and education institutions. The foundation is based on fourth generation evaluation (Guba & Lincoln, 1989) which is a methodology that utilizes the previous generations of evaluation: measurement, description, and judgment. It allows for value pluralism. This approach is responsive to all stakeholders and has a different way of focusing.