

8th International Conference and Exhibition on

MATERIALS SCIENCE AND ENGINEERING

May 29-31, 2017 Osaka, Japan

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

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The $\text{NdVO}_4\text{-V}_2\text{O}_5$ powders were synthesized by neodymium nitrate and ammonium metavanadate using the glycothermal method in ethylene glycol at 120°C for 1h. When $\text{NdVO}_4\text{-V}_2\text{O}_5$ hybrid powders absorb light that generate electron and hole than charge separation and migration to the surface of $\text{NdVO}_4\text{-V}_2\text{O}_5$ 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 $\text{NdVO}_4\text{-V}_2\text{O}_5$ hybrid powders can oxidize water molecules to form oxygen as shown in Fig. 1. However, the conduction of hybrid powders was perhaps lower the water reduction potential 0V that caused electron of hybrid powder can not reduce H^+ to form hydrogen in water or sacrificial agent solution (10% methanol). Based on the stoichiometry of NdVO_4 , the oxidation states and atomic orbitals are given by $\text{Nd}^{3+}(6s^2 4f^1)$, $\text{V}^{5+}(3d^0)$, and $\text{O}^{2-}(2p^6)$. The valence band is formed by coupling Nd 6s and O 2p orbitals while the conduction band is primarily controlled by V 3d orbitals, with contributions from the O 2p and Nd 4f 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 constructivism creates 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.

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