

## Development of Novel Band-Engineered $\text{Zn}(\text{Nb}_{1-x}\text{V}_x)_2\text{O}_6$ Solid solutions for the Photocatalytic Hydrogen/Oxygen Production

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Photocatalytic water splitting (reduction and oxidation) is potentially the most efficient and powerful way to produce hydrogen via solar energy conversion and to realize the hydrogen economy eventually. band structure controlling by band-engineering techniques is inevitable in order to develop novel visible-light-driven photocatalysts with a proper band-gap energy and an adequate band structure for the decomposition of water into hydrogen and oxygen. Making solid solution between two or more photocatalysts with different band structure (band-gap energy) is one of band engineering techniques and can control conduction band edge and valence band edge simultaneously, resulting in the control of band structure. In this paper, we report that the synthesis and characterizations of novel Band-Engineered  $\text{Zn}(\text{Nb}_{1-x}\text{V}_x)_2\text{O}_6$  solid solutions for the photocatalytic hydrogen/oxygen production from water under visible light irradiation.