

## Photocatalytic Water Splitting Over Deficient-Electron Iron Oxide Intercalated in HTiNb(Ta)O<sub>5</sub> Layered Perovskites Under Visible Light Irradiation

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Intercalation of semiconductor oxide with small bandgap into interlayer of layered perovskite is an attractive method to develop photocatalysts active under visible light region. In research, we intercalated iron oxide(Fe<sub>2</sub>O<sub>3</sub>) into the interlayer space of layered perovskite (HTiNb(Ta)O<sub>5</sub>) by a guest exchanged reaction using iron trinuclear acetate -hydroxocation, [Fe<sub>3</sub>CH<sub>3</sub>COO)<sub>7</sub>(OH)(H<sub>2</sub>O)<sub>2</sub>]<sup>+</sup>). We investigated the electronic and local coordination structures of the iron oxide stabilized between the titania-niobate and titania-tantalate layers by X-ray absorption near edge spectroscopy (XANES) and also the oxidation state by X-ray photoelectron spectroscopy (XPS). It was observed that the electronic and local coordination structures of the iron oxide stabilized between the layers of perovskite material were in general similar to those of Fe<sub>2</sub>O<sub>3</sub>(Fe(III)) state rather than FeO(Fe(II)). Finally, we investigated the photocatalytic activity of intercalated HTiNb(Ta)O<sub>5</sub> layered perovskite under visible light.