

Enhancement of Efficiency of Photocatalytic water Oxidation via Metal-Oxide Sensitizer synthesized on TiO₂

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We prepared water oxidation catalysts under visible light by using modified TiO₂(P25). TiO₂ (P25) was modified by synthesizing metal-oxide via photochemical reduction in order to have highly photocatalytic activity under visible light irradiation. Metal-oxide sensitizing the Titanium Oxide was shown the extended absorption to visible light and was highly enhancing photoactive catalysts as water oxidation at water splitting system. We could control absorption of visible range through various FeOxide sensitizer having different oxidation number of Iron. Also, we simply synthesized various FeOxide sensitizer on TiO₂(P25) through changing solution condition in photochemical reduction method. TiO₂/FeOxide powder out of various metal-oxide sensitizers, which was synthesized in condition of phosphate buffer, had highly enhancing photoactivity about water oxidation. We studied properties of TiO₂/FeOxide powder with DR UV-vis spectra and XRD and XPS and TEM image (EDS). The oxygen evolution rate of TiO₂/FeOxide was 0.181 cc/min (7.41μmol/min.) under visible light in buffer solution of pH 5.4.