

### Modification of NiTiO<sub>3</sub> visible light photocatalysts using Nb compounds

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Herein we prepared two types of Niobium-containing photocatalysts, Nb-doped NiTiO<sub>3</sub> and Nb<sub>2</sub>O<sub>5</sub>/NiTiO<sub>3</sub> heterojunction. Nb-doped NiTiO<sub>3</sub> was synthesized via modified Pechini method followed by a solvothermal treatment and calcination. Nb<sub>2</sub>O<sub>5</sub>/NiTiO<sub>3</sub> heterojunctions was synthesized by a hydrolysis-loading method. The structural and optical properties were characterized by XRD, Raman, FT-IR, SEM, TEM, XPS, N<sub>2</sub> adsorption/desorption technique, UV-vis spectra and PL spectra. Nb-containing photocatalysts were also examined in the degradation of methylene blue (MB) under visible light irradiation to understand the influence of the Nb doping into the lattice structure or Nb<sub>2</sub>O<sub>5</sub> heterojunction structure on the photocatalytic behavior. In the results Nb-doped NiTiO<sub>3</sub> exhibited higher photocatalytic activity than pure NiTiO<sub>3</sub> while Nb<sub>2</sub>O<sub>5</sub> heterojunction with NiTiO<sub>3</sub> caused a decrease in photocatalytic activity.