

**Figure S1.** The unit cell of anatase TiO<sub>2</sub> (**a**) and a Yb-doped anatase TiO<sub>2</sub> supercell (**b**). The red, gray, and green spheres represent oxygen, titanium, and Ytterbium atoms, respectively.

## Supplementary Material



**Figure S2.** EDS of Yb/TiO<sub>2</sub> (**a**). Element mapping images of Ti (**b**), O (**c**), and Yb (**d**) of Yb/TiO<sub>2</sub>. EDS: energy dispersive spectrometer.



**Figure S3.** Effect of different calcination temperatures on photocatalytic degradation of benzohydroxamic acid (BHA). The BHA concentration was 30 mg/L, and the catalyst dosage was 0.3 g/L.



**Figure S4.** Recycle tests of Yb/TiO<sub>2</sub>. The BHA concentration was 30 mg/L, and the catalyst dosage was 0.5 g/L.



**Figure S5.** TOC (total organic carbon) efficiency by 0.50% Yb/TiO<sub>2</sub>, pure TiO<sub>2</sub>, and blank. The BHA concentration was 30 mg/L, and the catalyst dosage was 0.3 g/L.