Supporting Information

A Simple Template-free Approach to TiO$_2$ Hollow Spheres with Enhanced Photocatalytic Activity

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**Figure S1.** XRD patterns of the samples prepared with different additives at 180°C for 12 h.

**Figure S2.** Reaction scheme for hydrothermal crystallization of anatase.
**Figure S3.** XPS survey spectra of the TiO$_2$ samples prepared at $R = 0$ and 1, respectively.
**Figure S4.** High-resolution XPS spectra of F1s (a) and N1s (b) of the TiO$_2$ hollow spheres prepared at $R = 1$.

**Figure S5.** UV-vis absorption spectra of the samples prepared at $R = 0$ and 1, respectively.