Synthesis of Efficient Nanosized Rutile TiO₂ and Its Main Factors
Determining Its Photodegradation Activity: Roles of Residual Chloride and Adsorbed Oxygen

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Supporting information (SI)
SI-figure 1 XPS spectra of DS0, DS1.0, DS1.8 and DS2.0 TiO₂ samples for Ti2p and O1s core levels
SI-Figure 2 XRD patterns of TiO$_2$ samples prepared with HCl, HNO$_3$ and H$_2$SO$_4$
**SI-figure 3** Uv-vis DRS spectra of DS0, DS1.0, DS1.8, DS2.0 and DS2.5 TiO$_2$ samples

![Uv-vis DRS spectra](image)

**SI-figure 4** XRD patterns (A) and SPS responses (B) of TiO$_2$ samples prepared by calcining DS0 at different temperature from 0 to 800 °C

![XRD patterns and SPS responses](image)
SI-figure 5 SPS responses of DS0 in different O$_2$-concentration atmospheres
SI-figure 6 SPS responses of DS0-T800 in different O₂-concentration atmospheres

SI-figure 7 Photodegradation rates of RhB solution on DS2.0 and P25 TiO₂ under natural sunlight
**SI-figure 8** Photodegradation rates of RhB on different TiO$_2$ samples under visible (A) and single wavelength (B) light.
SI-figure 9 Photodegradation rates of RhB on the rutile-phase DS0-T800 sample prepared by calcining DS0 at 800 ºC and the DS0-T800-Cl sample obtained by the addition of a certain amount of NaCl into the reaction suspension composed of RhB dye solution and the DS0-T800 sample.

SI-figure 10 XRD patterns of DS2.0 samples unmodified and modified with H₃PO₄ of 0.05, 0.1 and 0.3 M.
SI-figure 11 XPS spectra of un-modified and phosphate modified TiO$_2$ for Ti2p, O1s, Cl2p and P2p core levels
SI-figure 12 SPS responses of the modified TiO\textsubscript{2} in different O\textsubscript{2}-concentration atmospheres

SI-figure 13 Photodegradation rates of phenol solution on DS2.0, DS2.0-0.05P, DS2.0-0.1P and DS2.0-0.3P TiO\textsubscript{2} samples