Supporting Information

Molten salt construction of stable oxygen vacancies on TiO$_2$ for
enhancement of visible light photocatalytic activity

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**Fig. S1** Effect of MS dosages on the annealing of P25.

**Fig. S2** X-band EPR spectra of B-TiO$_2$ synthesized with MS at different time and temperature. A longer annealing time and a higher temperature will lead to increase of the bulk Ti$^{3+}$ defect concentration and decrease of surface oxygen vacancy concentration.
Fig. S3 TEM of TiO$_2$ synthesized with addition of NaF via molten salt.

Fig. S4 Photographs of B-TiO$_2$ calcinated in air at different temperature for 2h. It is found that the dark blue color fades to white gradually with increasing the calcination temperature from 300 °C to 600 °C.

Fig. S5 XRD of TiO$_2$ synthesized with different TFA amount via MS method.
**Fig. S6** Effect of TFA amount on photocatalytic activity of B-TiO$_2$.

**Fig. S7** Effect of molten salt dosage on photocatalytic activity.

**Fig. S8** Photodegradation of RhB over calcinated B-TiO$_2$ at different temperature. It is clear to see that the photocatalytic activity of calcinated B-TiO$_2$ at 300$^\circ$C decreases slightly. However, the
photocatalytic activity of samples calcined at 400°C, 500°C, and 600°C are almost vanishes.

Fig. 59 Photodegradation of RhB under full spectrum light irradiation.