A facile solid phase reaction to prepare  $TiO_2$  mesocrystals with exposed {001} facets and high

photocatalytic activity

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Supporting Information

Fig. S1 Powder XRD patterns of the mesocrystalline samples sintered at 900 °C (a) and 1000 °C (b).



Fig. S2 TEM images and SAED patterns of the mesocrystalline samples sintered at 700  $^{\circ}$ C (a and b) and 900  $^{\circ}$ C (c and d).



Fig. S3 SEM images of the 700  $^{\circ}$ C mesocrystalline samples, which was prepared by sintering the NH<sub>4</sub>TiOF<sub>3</sub> mesocrystals from room temperature.