

Electronic Supplementary Information

Enhanced visible-light-induced photocatalytic activity of anatase TiO₂ nanocrystallite derived from CMK-3 and tetrakis (dimethylamino) titanium

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Synthesis of SBA-15:

SBA-15 was prepared using the triblock copolymer, $\text{EO}_{20}\text{PO}_{70}\text{EO}_{20}$ (Pluronic P123, Aldrich), as the surfactant and tetraethyl orthosilicate (TEOS, 98%, Acros) as the silica source, following the synthesis procedure reported by Zhao et al. In a typical synthesis, 2 g of nonionic tri-block copolymer surfactant $\text{EO}_{20}\text{PO}_{70}\text{EO}_{20}$ (P123) was dispersed in 60 ml of 2M HCl solution under stirring at 37 °C until a clear solution was obtained. Then, 0.021 mol of TEOS were added to the above solution and the contents were stirred at 37 °C for 24 h, then the complex was put into an oven and aged at 80 °C for 48 h. The obtained suspension was filtered, dried at 80 °C overnight and finally calcined at 550 °C for 4 h to remove the template. The small-angle X-ray diffraction pattern has been depicted in Fig. S1.

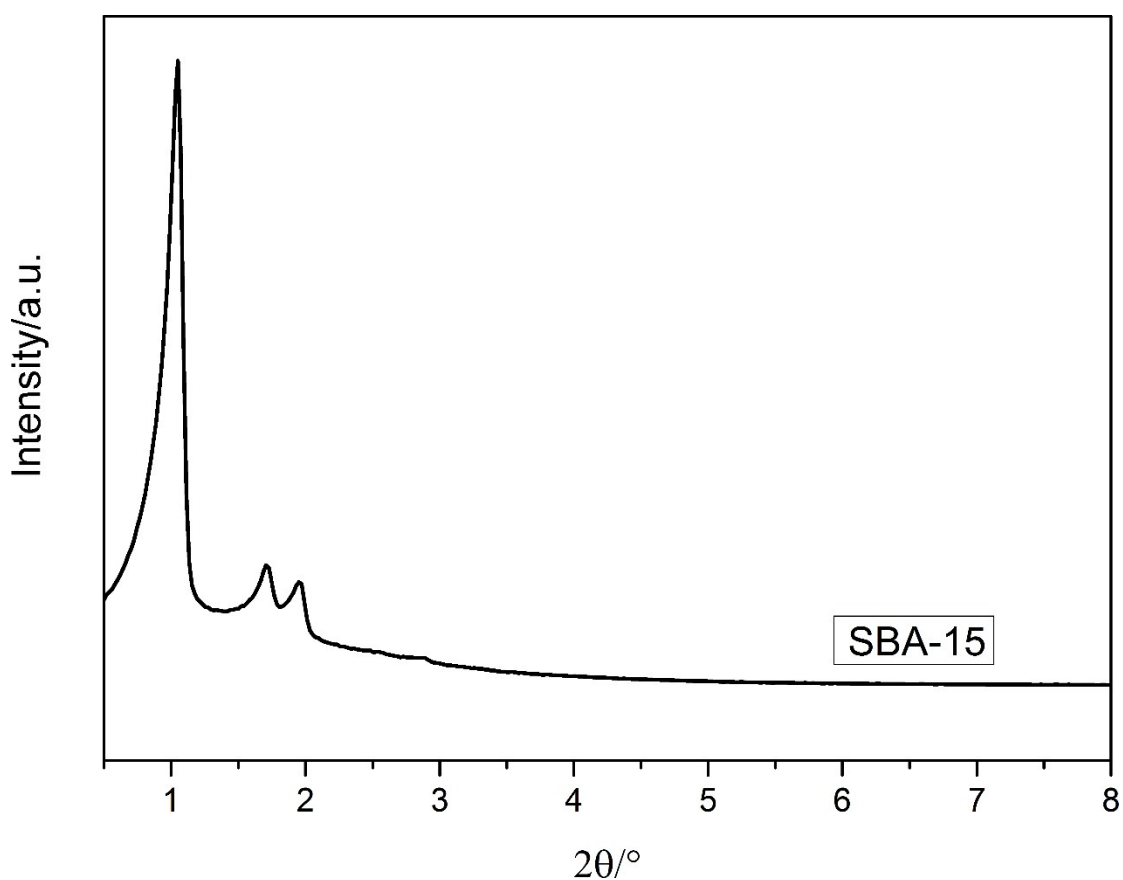


Fig. S1 small-angle X-ray diffraction pattern of SBA-15

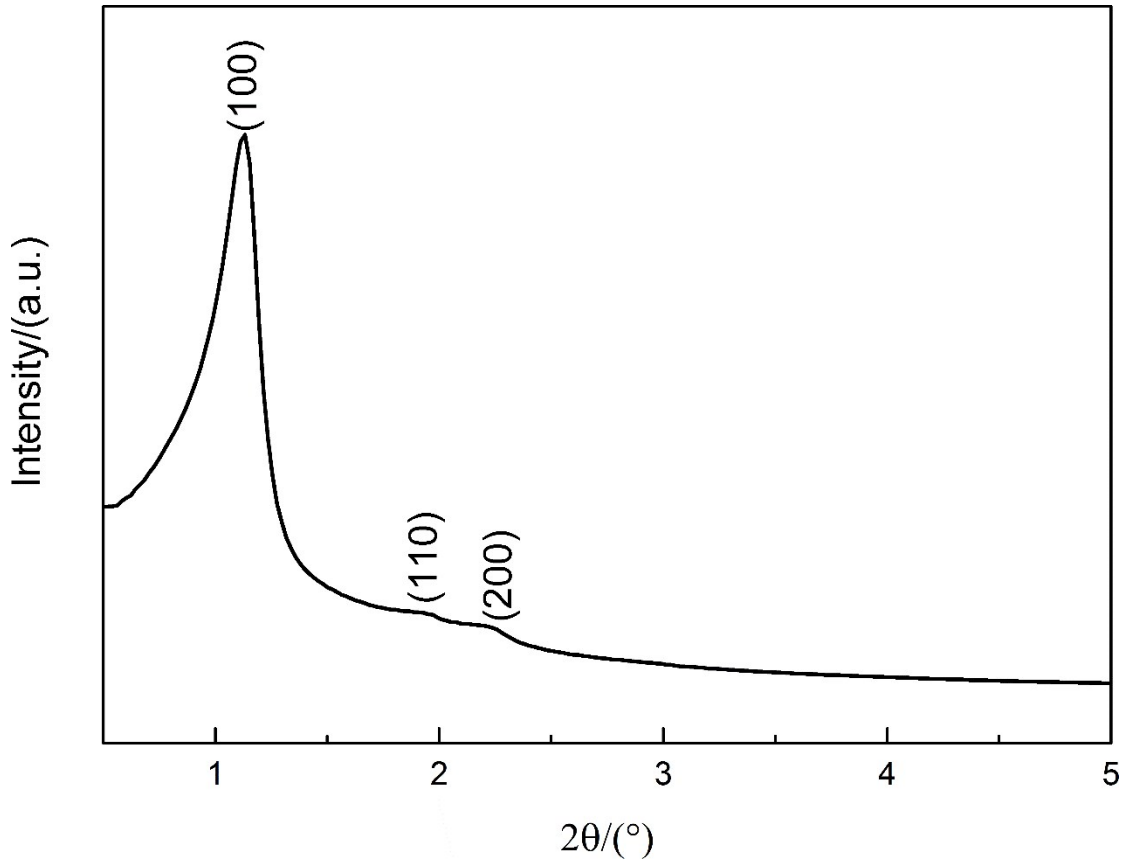
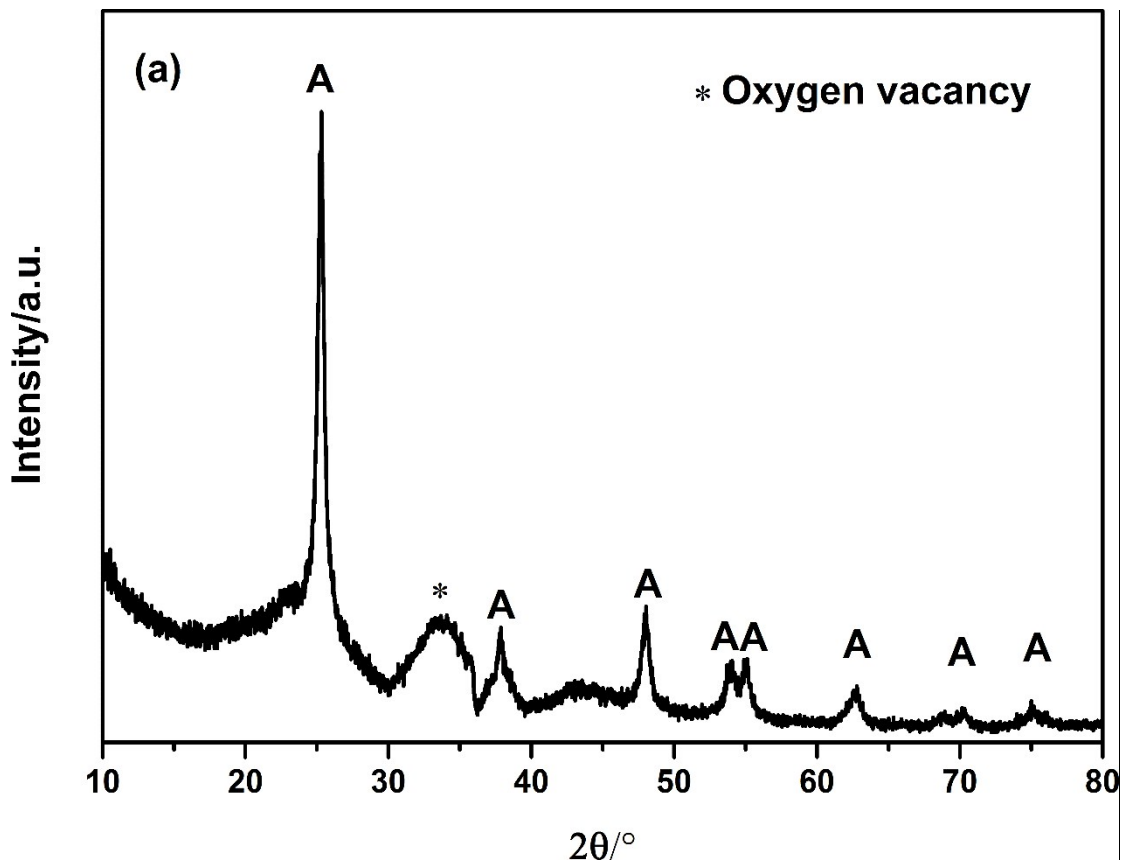


Fig. S2 Small-angle X-ray diffraction pattern of CMK-3



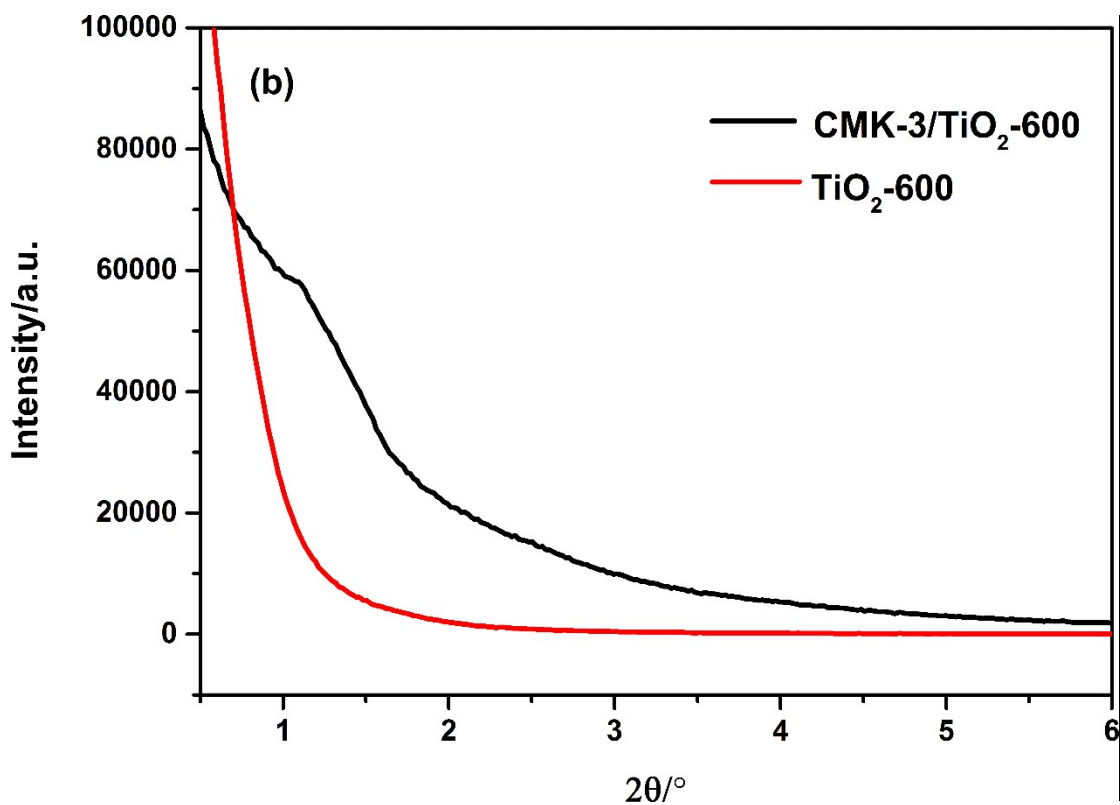
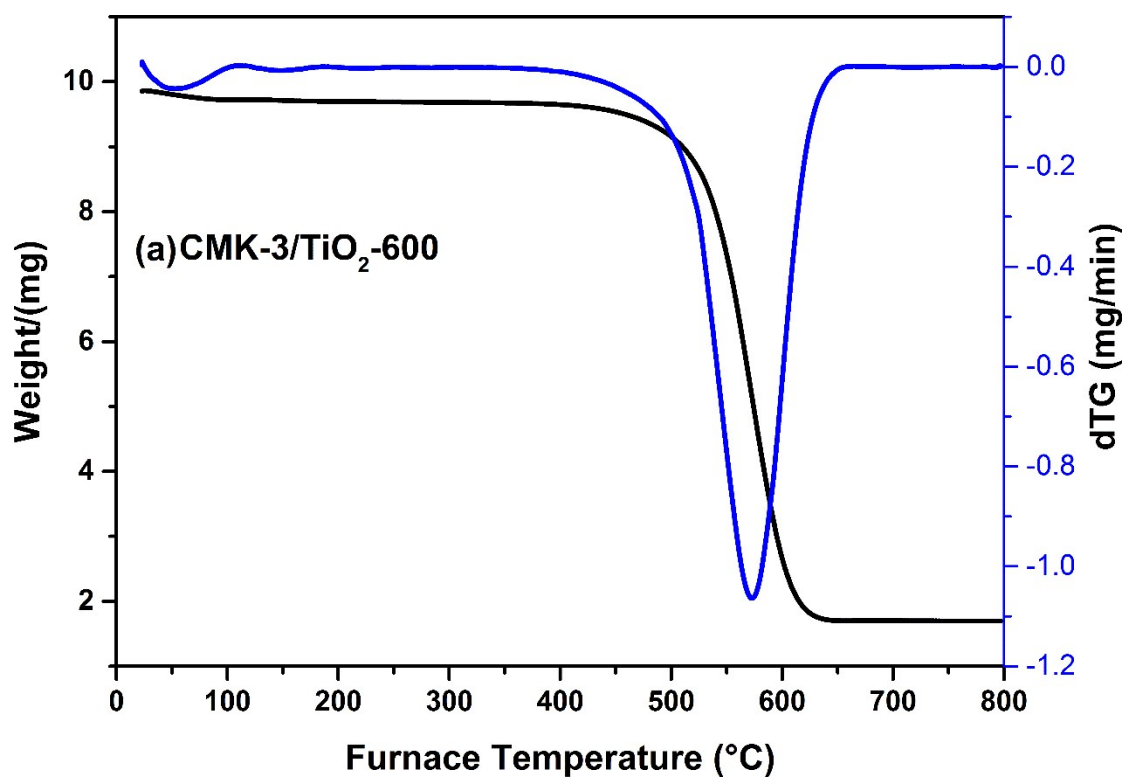


Fig. S3 Wide angle XRD pattern of CMK-3/TiO₂-600 (a) and small angle X-ray diffraction patterns of TiO₂-600 and CMK-3/TiO₂-600 (b)



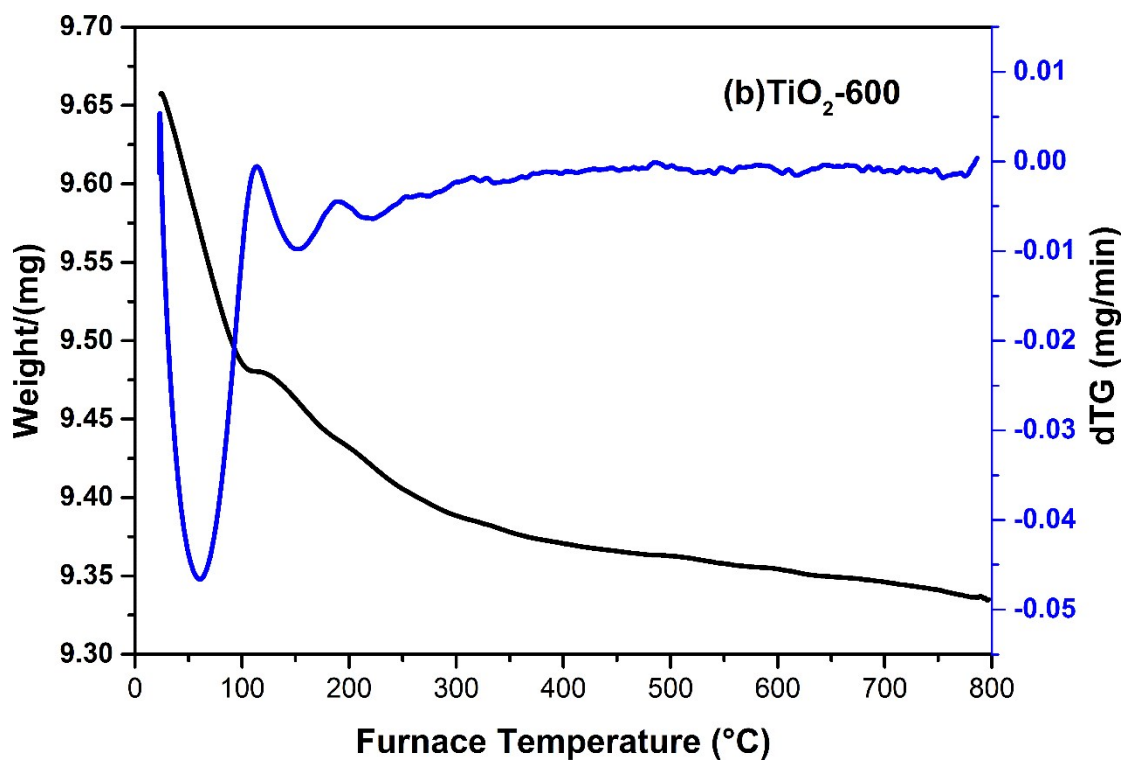


Fig. S4 Thermogravimetric analysis results of CMK-3/TiO₂-600 (a) and TiO₂-600 (b)

Thermogravimetric analysis results show the weightlessness of CMK-3/TiO₂-600 and TiO₂-600. The corresponding weightlessness were 82.55% and 1.37%, respectively and the weight loss before 150 °C could be attributed to the water loss. The calculated C/Ti molar ratio of CMK-3/TiO₂-600 was 31.5, slightly less than the original C/Ti molar ratio of 36.5:1, which can be attributed to the slight weight loss of carbon during heat treatment in inert atmosphere. In addition, the weight loss of TiO₂-600 (1.37%) suggested that a little amount of carbon residual exist after calcination. The results also show that the carbon has the maximum weight loss rate at 570 °C.