Electronic Supplementary Information (ESI)

Facile synthesis of TiO_2 hollow spheres composed of high percentage reactive facets for enhanced photocatalytic activity

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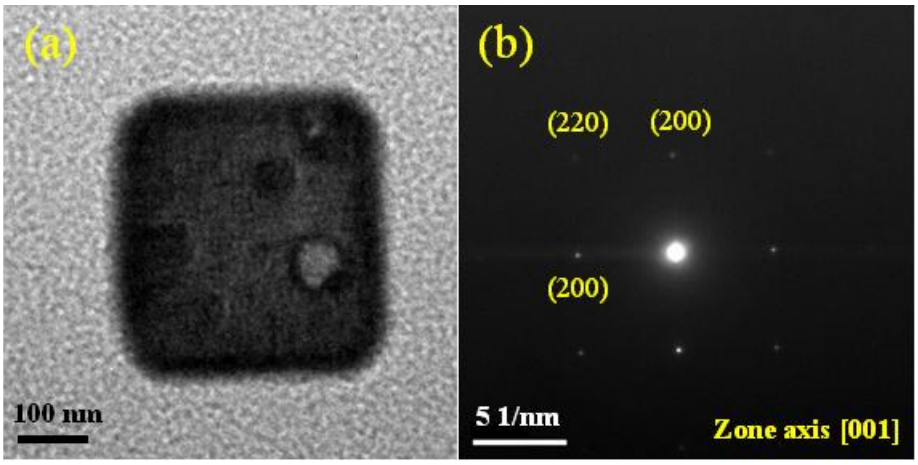

Fig. S1 TEM image and single crystal electron diffraction pattern of TiO_2 nanosheets obtained from TiO_2-HS-1

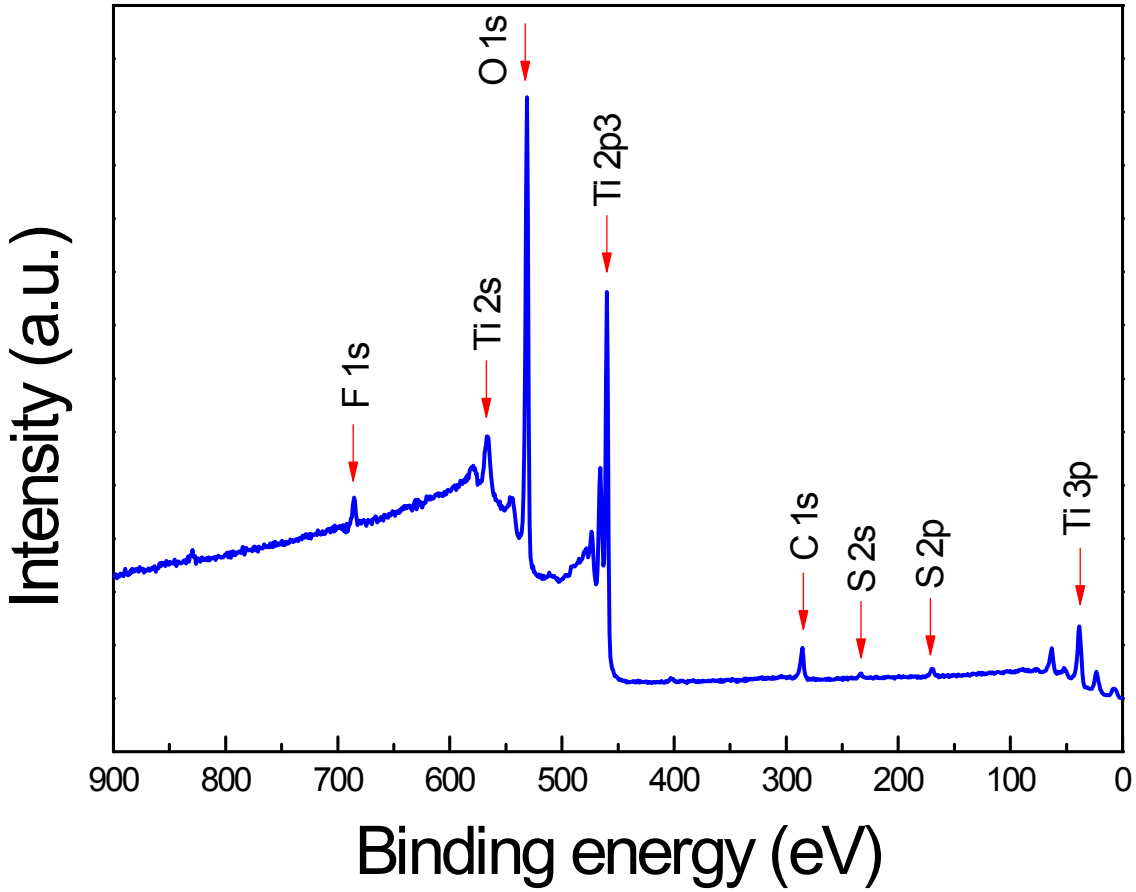

Fig. S2 The survey spectrum of TiO_2-HS-1 hollow spheres

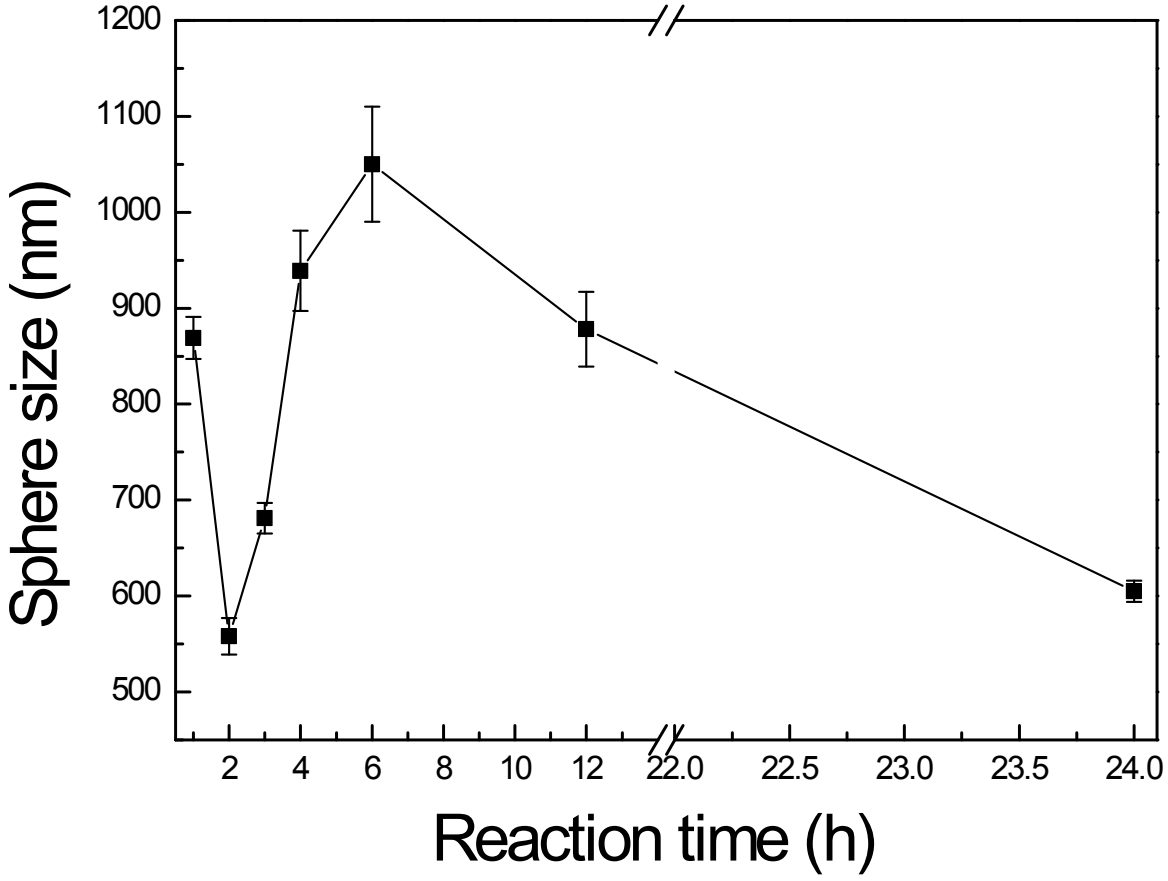

Fig. S3: The size growth of TiO_2-HS-1 sphere as a function of reaction time in hydrothermal synthesis

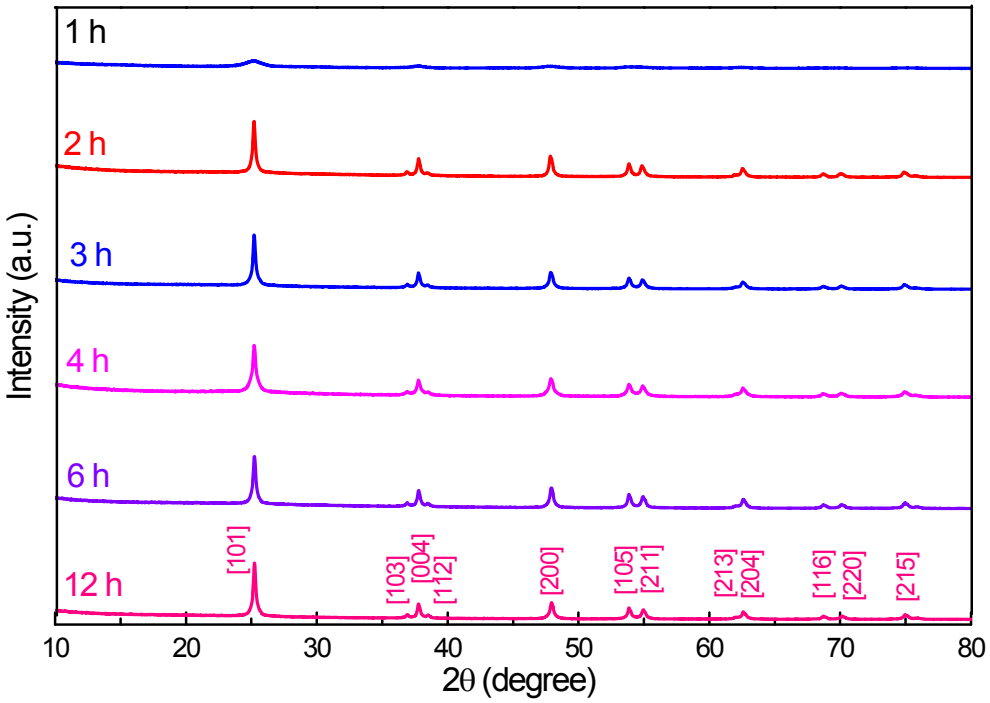

Fig. S4 XRD patterns of TiO_2-HS-1 samples collected at different hydrothermal stages

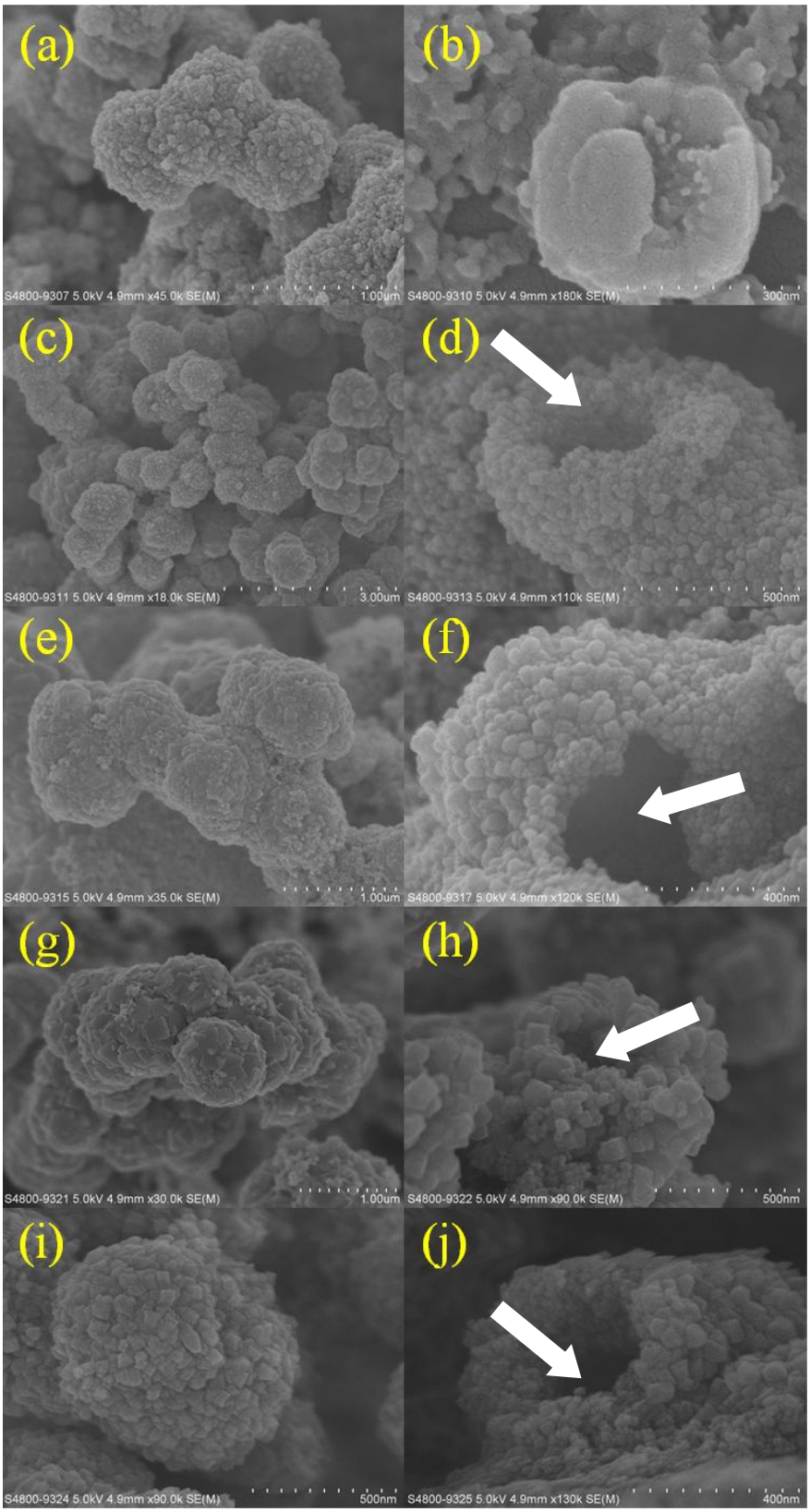

Fig. S5 FE-SEM images of TiO_2-HS-2 samples collected at different hydrothermal stages (a) and (b): 1 hour; (c) and (d): 2 hours; (e) and (f): 3 hours; (g) and (h): 4 hours; (i) and (j): 6 hours. Arrow: TiO_2 hollow structure

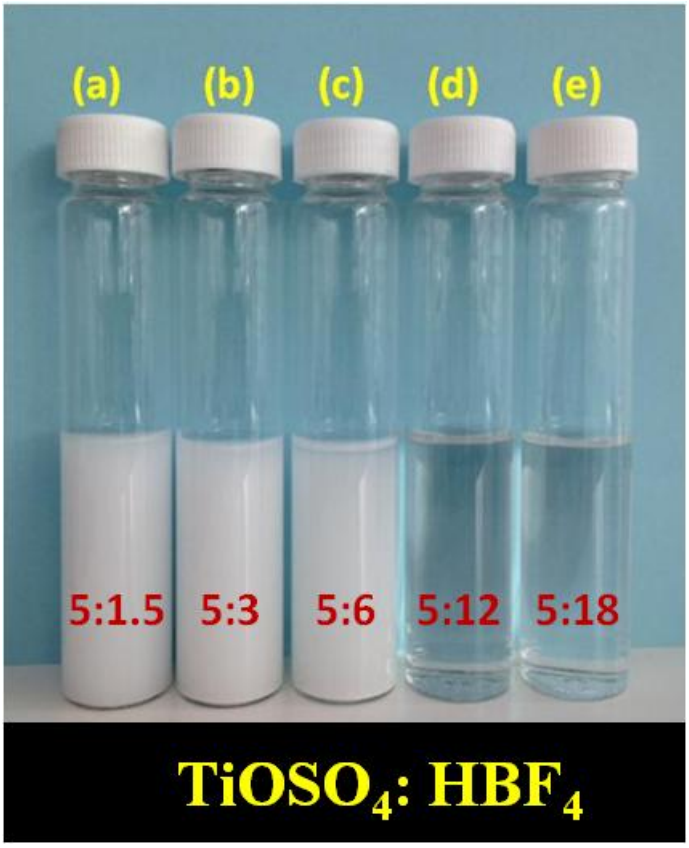

Fig. S6 Digital photos of the as-prepared TiO_2 samples by hydrothermal treatment at 180°C for 24 hours. (a) 0.2 g $TiOSO_4$+ 0.0625 mL HBF_4+30 mL H_2O, $TiOSO_4$: HBF_4=5 : 1.5; (b) 0.2 g $TiOSO_4$+ 0.125 mL HBF_4+30 mL H_2O, $TiOSO_4$: HBF_4=5 : 3; (c) 0.2 g $TiOSO_4$+0.25 mL HBF_4+30 mL H_2O, $TiOSO_4$: HBF_4=5 : 6; (d) 0.2 g $TiOSO_4$+0.5 mL HBF_4+30 mL H_2O, $TiOSO_4$: HBF_4=5 : 12; and (e) 0.2 g $TiOSO_4$+ 0.75 mL HBF_4+30 mL H_2O, $TiOSO_4$: HBF_4=5 : 18.

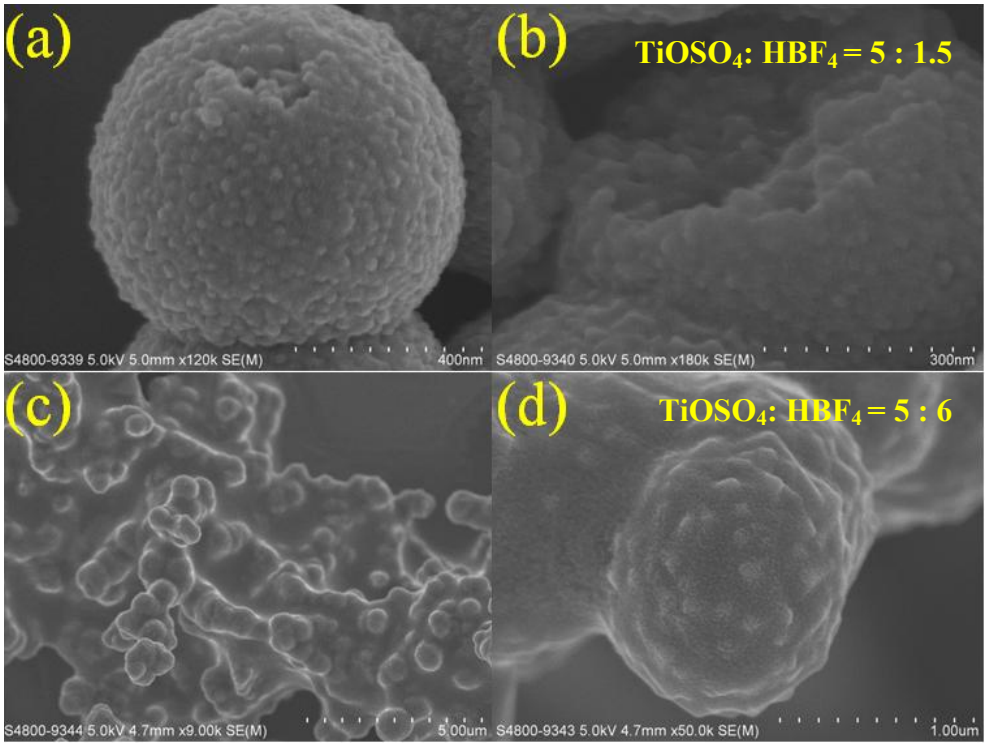

Fig. S7 FE-SEM images of the as-prepared TiO_2 samples with various HBF_4 concentration and hydrothermal treatment at 180°C for 24 hours. (a) and (b) 0.2 g $TiOSO_4$+ 0.0625 mL HBF_4+30 mL H_2O, $TiOSO_4$: HBF_4=5 : 1.5; (c) and (d) 0.2 g $TiOSO_4$+ 0.25 mL HBF_4+30 mL H_2O, $TiOSO_4$: HBF_4=5 : 6

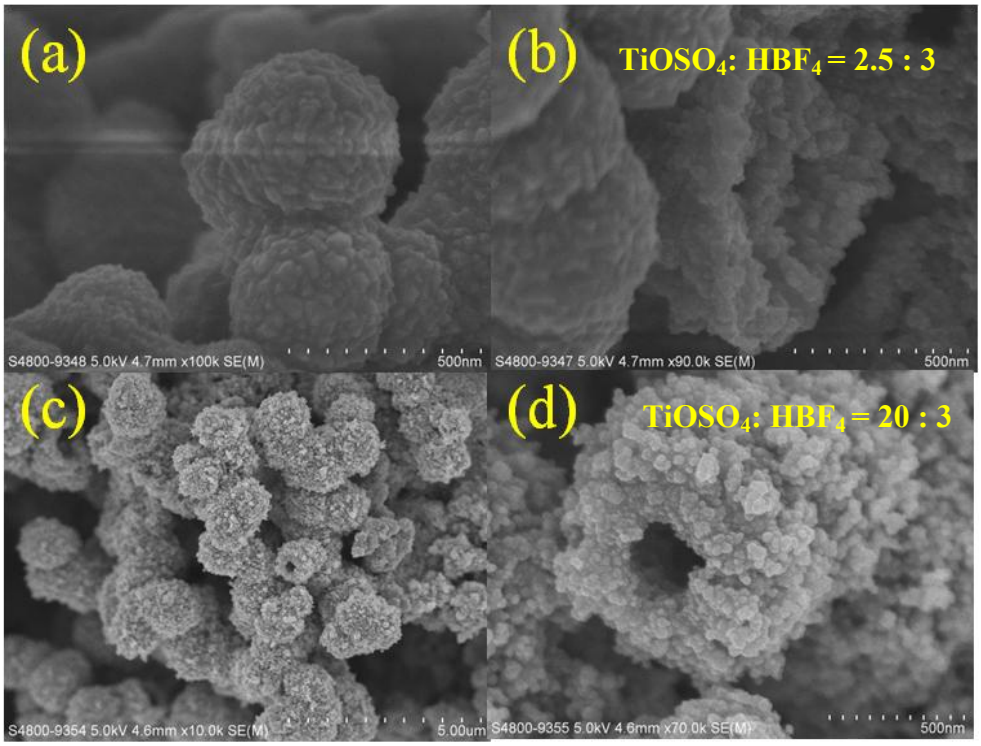

Fig. S8: FE-SEM images of the as-prepared TiO_2 samples with various $TiOSO_4$ concentration and hydrothermal treatment at 180°C for 24 hours. (a) and (b) 0.1 g $TiOSO_4$+ 0.125 mL HBF_4+30 mL H_2O, $TiOSO_4$: HBF_4=2.5 : 3; (c) and (d) 0.8 g $TiOSO_4$+0.125 mL HBF_4+30 mL H_2O, $TiOSO_4$: HBF_4=20 : 3

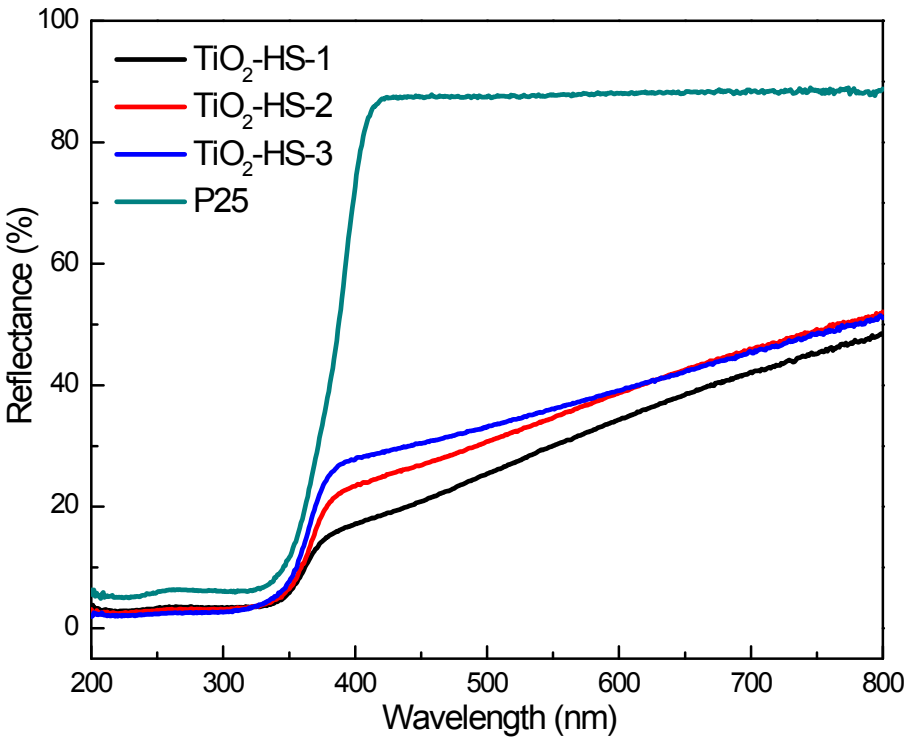

Fig.S9 UV-*vis* diffuse reflectance spectra of TiO_2 samples

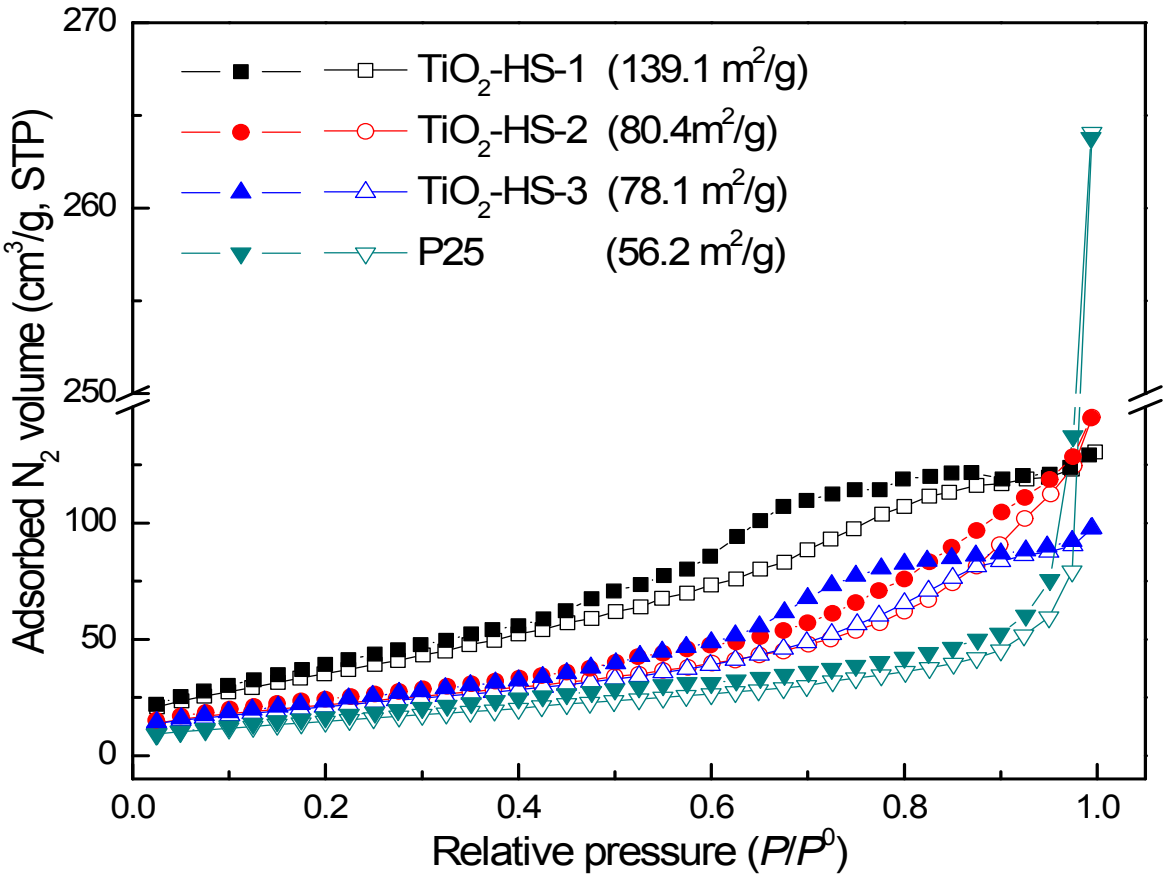

Fig. S10 N_2 adsorption-desorption isotherms and specific surface areas of TiO_2 samples (hollow symbols: N_2 adsorption; solid symbols: N_2 desorption)

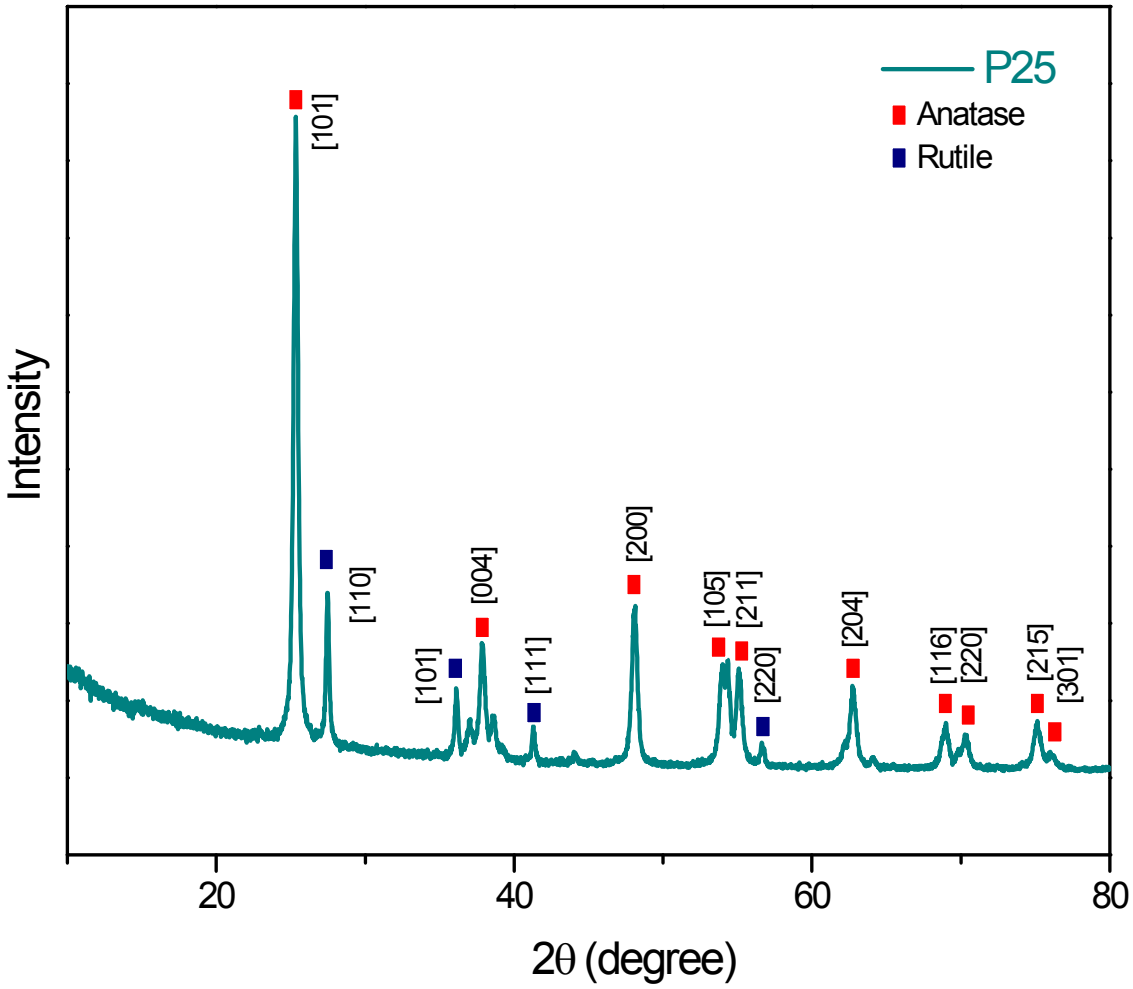

Fig. S11 XRD patterns of Degussa P25 sample