Electronic Supplementary Material (ESI) for Nanoscale
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SUPPORTING INFORMATION

Facile preparation of magnetic γ-Fe_2O_3/TiO_2 Janus hollow bowls with efficient visible-light photocatalytic activities by asymmetric shrinkage

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SUPPLEMENTARY FIGURE

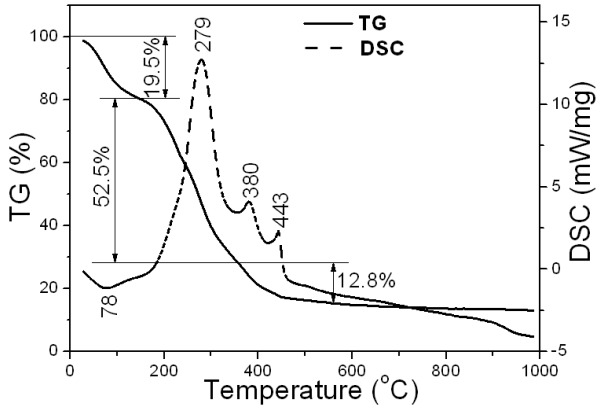

Fig. S1 The TG-DSC analysis of the electrosprayed bowl-shaped gel particles. It indicates that the gel particles have three differentiated steps of weight loss in the temperature range of 40-1000 °C. The first weight loss of 19.5 % occurs at around 40-145 °C, accompanied with a broad endothermic peak at 78 °C, which is ascribed to the evaporation of water and isoamyl alcohol. The second weight loss of 52.5 % appears at around 145-350 °C, corresponding to a sharp exothermic peak at about 279 °C. This may be attributed to the decomposition of organic metal compounds and the degradation of side chain of PVP through the intermolecular cross-linking reaction. The third step at around 350-500 °C involves 12.8% weight loss and accompanies two sharp exothermic peaks at 380 and 445 °C in the DSC curve, respectively. This could be attributed to the oxidation and decomposition of the main chain of PVP. At temperature higher than 450 °C, no weight loss is observed in the TG curve, indicating that the organic components have completely decomposed before 450 °C. The gel bowls undergo intensive weight loss (as high as 74%) caused by the decomposition of organic metal compounds and PVP in the process of calcination, leading to significant volume shrinkage and the formation of γ-Fe_2O_3/TiO_2 rigid particles at about 450 °C.

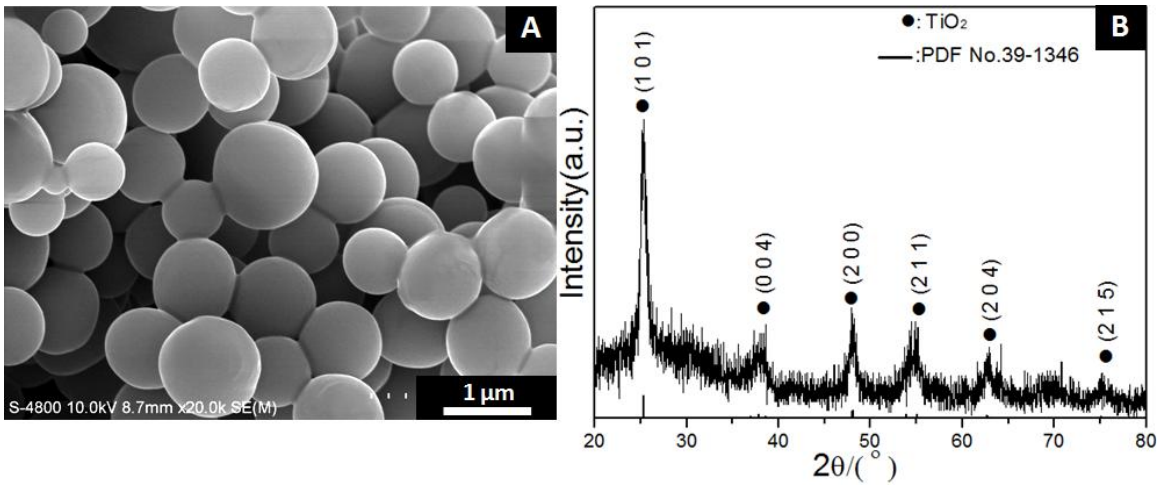

Fig. S2 SEM image and XRD pattern of the anatase TiO_2 particles fabricated by electrospraying Solution B with a subsequent calcination process at 450 °C for 2h with the heating rate of 50 °C/min.

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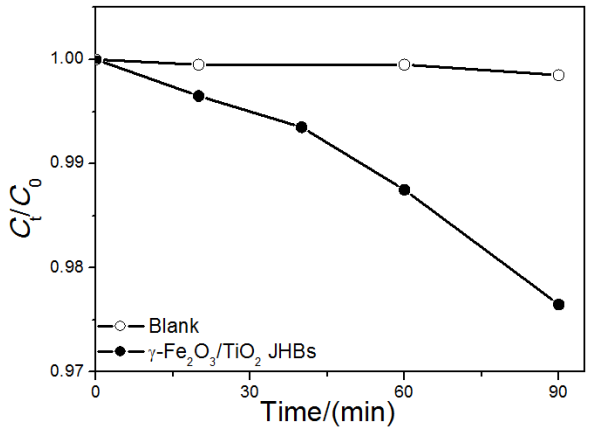
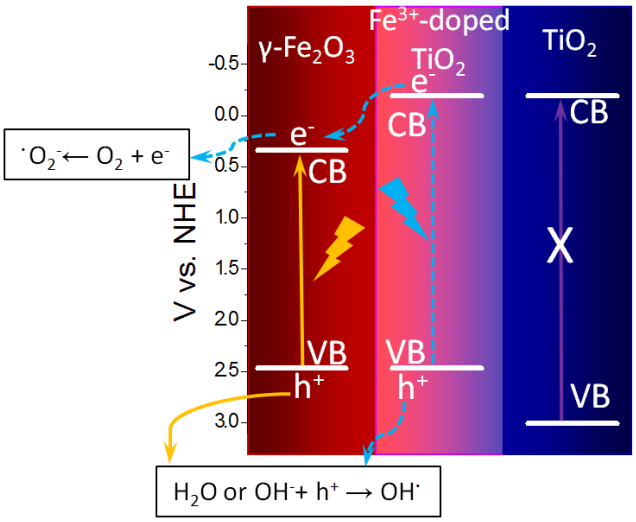


Fig. S3 Normalized phenol concentration versus visible light irradiation time for the colorless phenol aqueous solutions with or without the as-obtained γ-Fe_2O_3/TiO_2 JHBs, C_0 and C_t denote the initial concentration and the concentration at irradiation time *t* of phenol in the system, respectively.



Scheme S1 The possible transporting paths of the photogenerated charge pairs at the Fe_2O_3/Fe^{3+}-doped-TiO_2/TiO_2 heterojuctions.