Supporting Information

Advanced visible-light-driven photocatalyst upon the incorporation of sulfonated graphene

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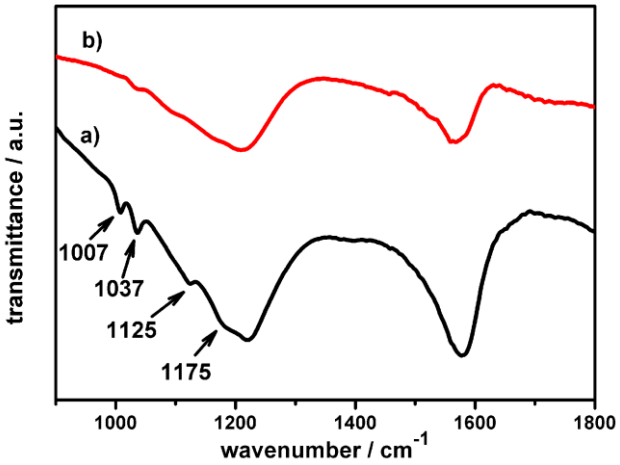

Fig. S1 FTIR spectra of sulfonated graphene (a) and chemically reduced graphene oxide (b).

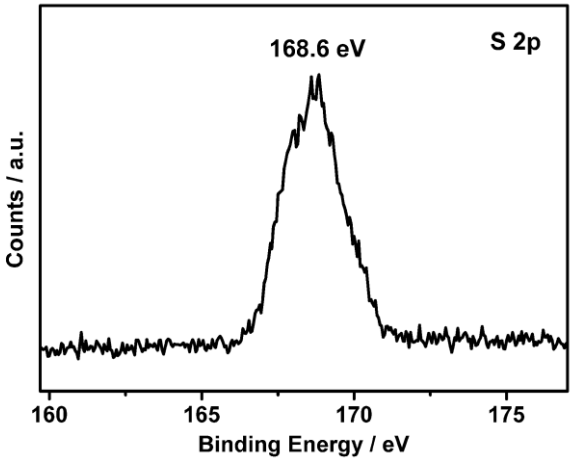

Fig. S2 The S2p spectrum of sulfonated graphene.

As shown in Fig. S1, FTIR spectra were performed to confirm the presence of $–SO_3H$ units. By comparison with chemically reduced graphene oxide, SGE display peaks at 1175 cm^{-1} (υ_{S-O}), 1125 cm^{-1} (υ_{S-O}) and 1037 cm^{-1} ($\upsilon_{S\text{-}phenyl}$) which confirm the presence of sulfonic acid group. Furthermore, the peak at 1007 cm^{-1} (υ_{C-H} in-plane bending) is the characteristic vibrations of the p-disubstituted phenyl group[1]. As shown in Fig. S2, it is necessary to note that the peak at 168.6 eV corresponds to S2p XPS spectrum, suggesting the existence of benzenesulfonic groups in sulfonated graphene nanosheets[2].

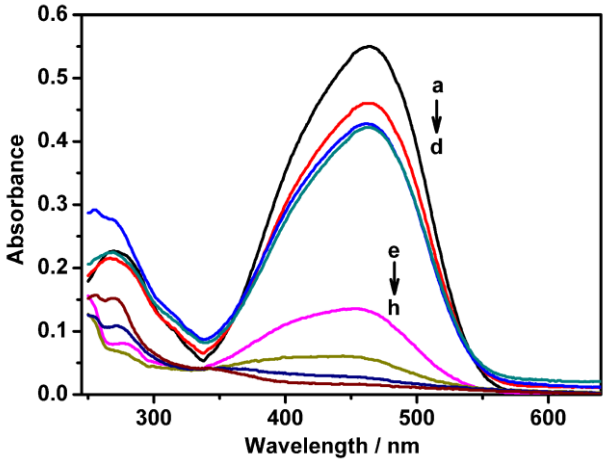

Fig. S3 Typical real-time absorption spectra of MO dye during the photodegradation process over Ag@AgBr/SGE (SGE contents 1.33 wt %) under visible irradiation ($\lambda > 420$ nm). The curves marked as (a) to (d) are the absorption spectra of MO in the dark with absorption time varying in 0, 10, 20 and 30 min while (e) to (h) stand for irradiation time in 0.5, 1, 1.5, 2 min.

References

1 Y. Si and E. T. Samulski, *Nano Lett.*, 2008, **8**, 1679.

2 G. Zhao, L. Jiang, Y. He, J. Li, H. Dong, X. Wang and W. Hu, *Adv. Mater.*, 2011, **23**, 3959.