

Electronic Supplementary Information
for
Highly efficient visible-light-induced photocatalytic
hydrogenation of nitrobenzene to aniline in water

Weiming Wu, Rui Lin, Lijuan Shen, Ruowen Liang, Rusheng Yuan, Ling Wu^{*}

State Key Laboratory Breeding Base of Photocatalysis, Research Institute of
Photocatalysis, Fuzhou University, Fuzhou 350002, PR China

* Corresponding author: Prof. Ling Wu

E-mail: wuling@fzu.edu.cn

Phone: +86-591-83779362

Fax: +86-591-83779105.

Journal: RSC Advances

Number of Pages: 9

Number of Figures: 7

Experimental section

1. GC-MS analysis

The presence of nitrobenzene and aniline was detected by GC-MS. Prior to GC-MS analysis, 100 mg NaCl (A.R., SCRC) and 15 mg Na₂SO₃ (A.R., SCRC) were dissolved in 5 mL of the reaction solution. Then, 5 mL of ethyl acetate (A.R., SCRC) was added into this aqueous solution. After shaking for 10 min and stood for 2 min, 1 mL of the organic phase was moved to a sample vial (2mL) for GC-MS analysis. GC-MS analysis was carried out by using a Hewlett Packard 6890 apparatus equipped MSD 5973 detector. The GC was fitted with a HP-5 MS capillary column (30 m × 250 µm; film thickness: 0.25 µm). The temperature program was as follows: injector temperature 250 °C, initial oven temperature 2.5 min at 45 °C, then 10 °C/min to 180 °C, final time was 5 min at 180 °C. Transfer line temperature was 280 °C. Helium was used as carried gas at 2.2 psi pressure with a flow of 0.6 mL/min and electronic pressure control on. 5 µL of the sample was injected automatically. MS spectra of separated components were compared with ones from NIST98 MS database.

Fig. S1 (a) TEM and (b) high-resolution TEM images for the Bi_2MoO_6 sample.

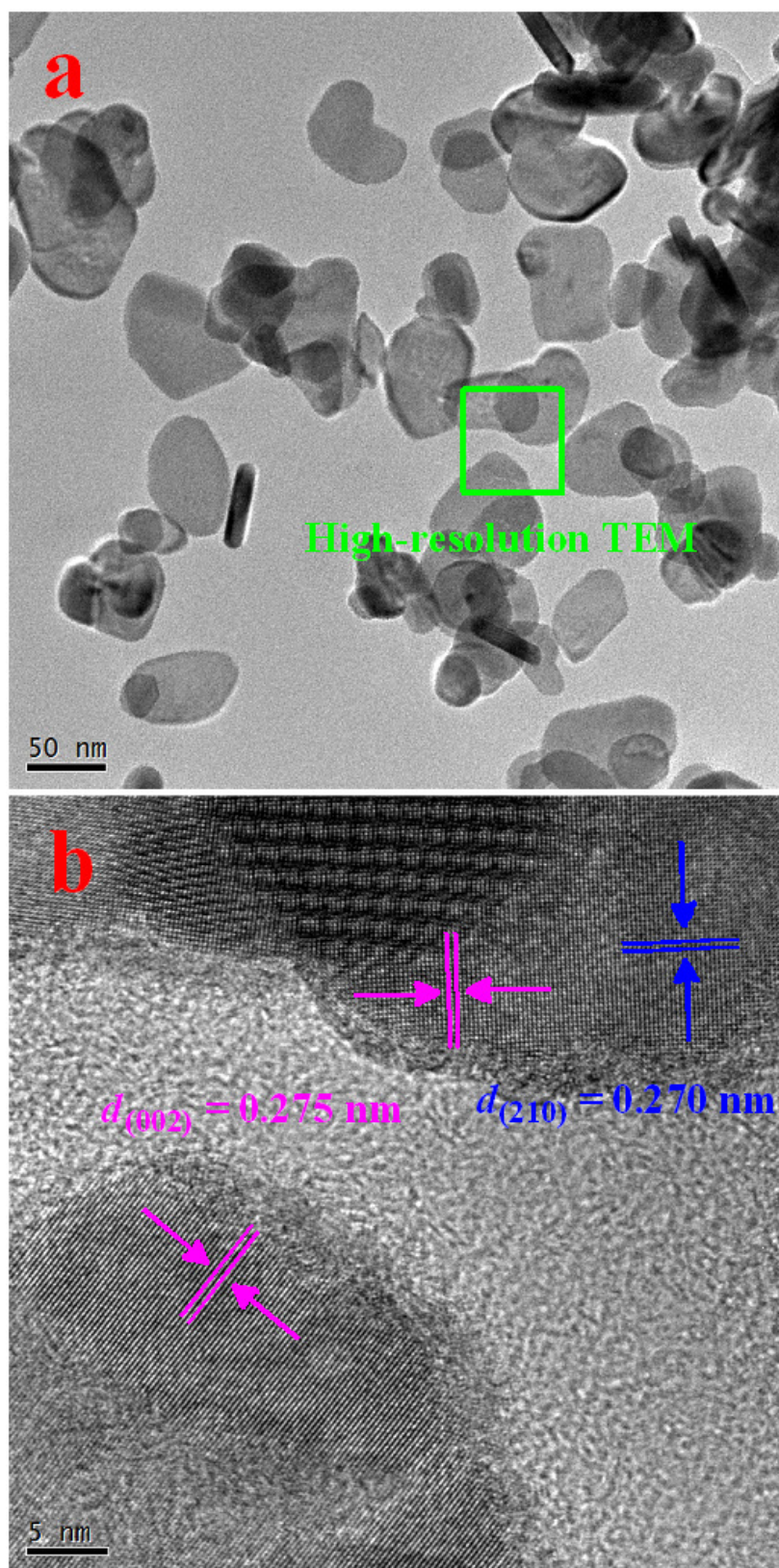


Fig. S2 Liner relationship between the concentration (C) and the absorbance (A) at 229 nm for aniline.

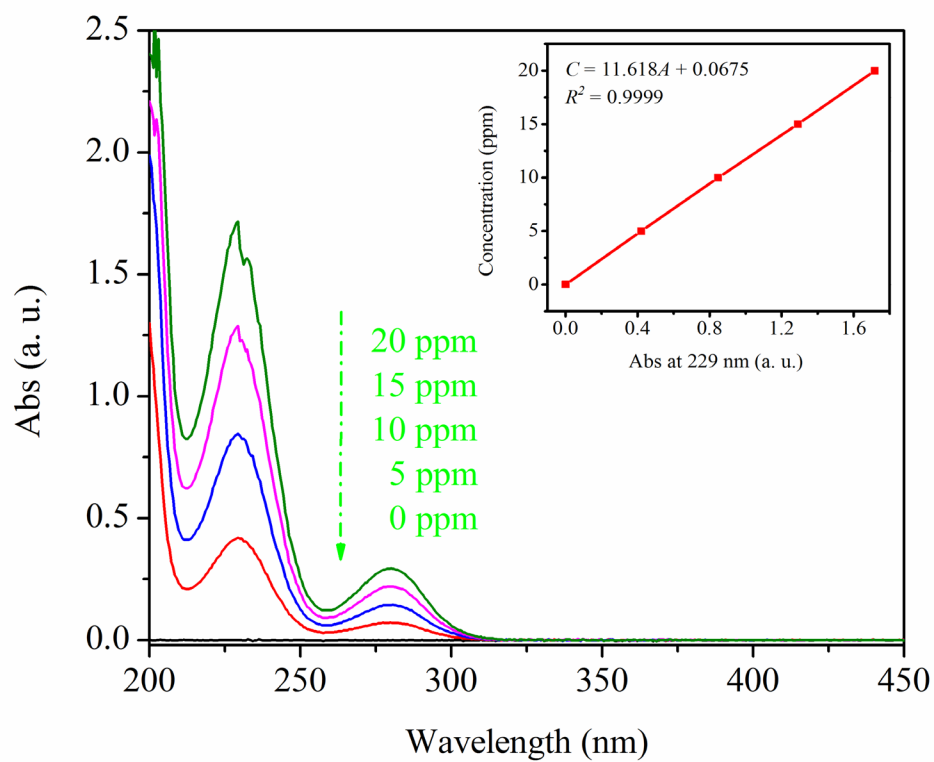


Fig. S3 GC-MS spectra of the nitrobenzene aqueous solution before the reaction.

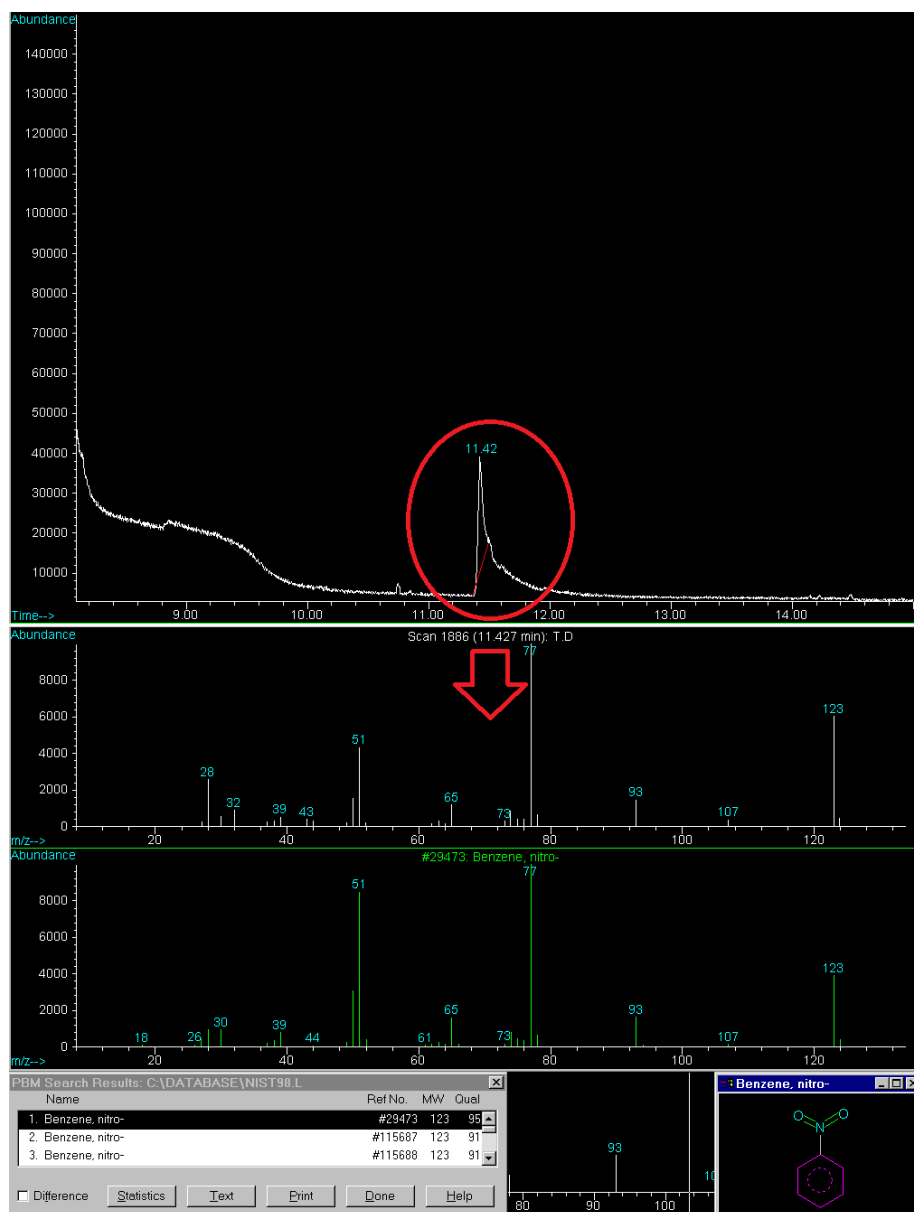


Fig. S4 GC-MS spectra of the nitrobenzene aqueous solution after the reaction.

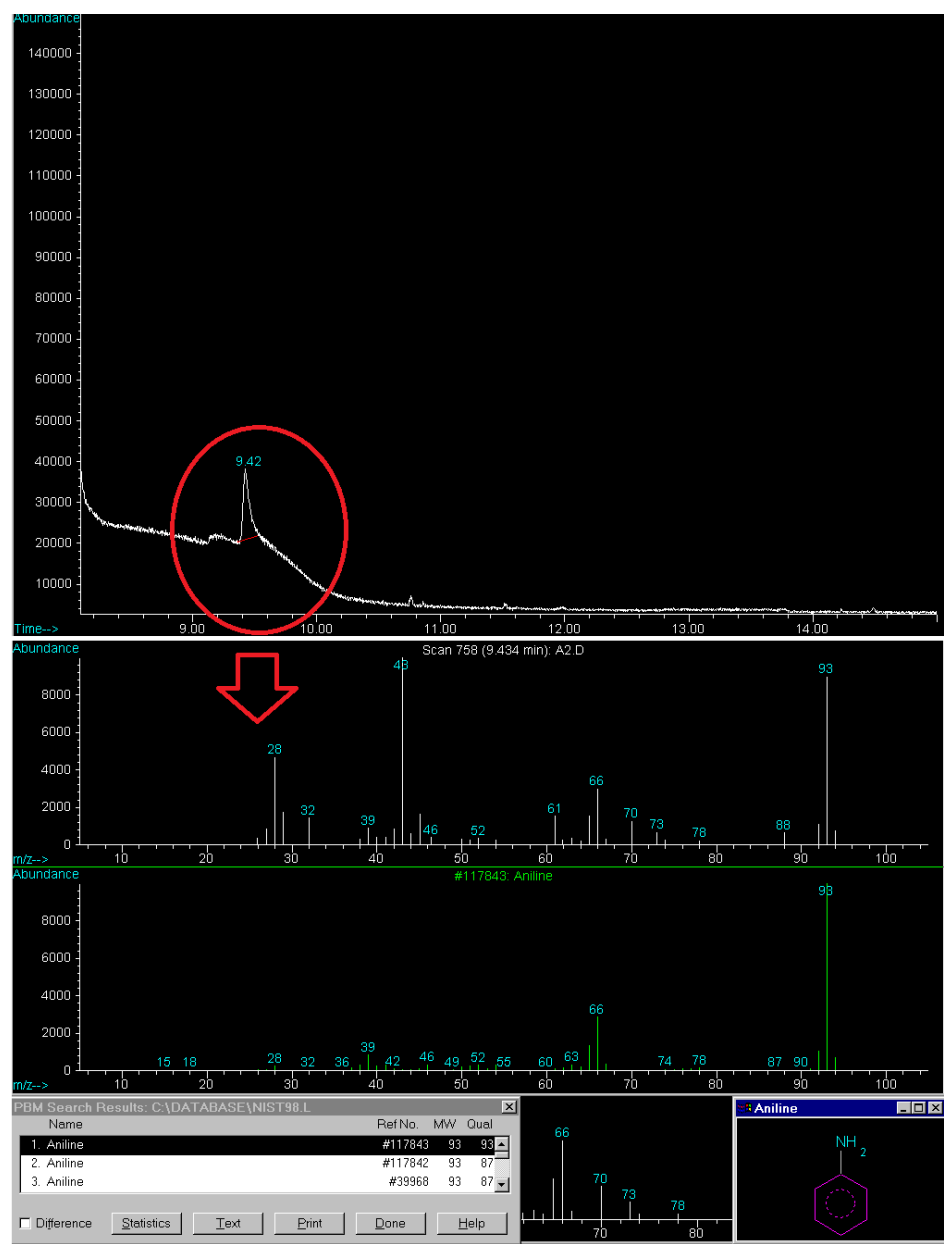


Fig. S5 Photocatalytic hydrogenation of nitrobenzene over the TiO_2 photocatalyst under UV light irradiation ($\lambda \geq 300$ nm) in the presence of (a) HCO_2NH_4 and (b) $(\text{NH}_4)_2\text{C}_2\text{O}_4$.

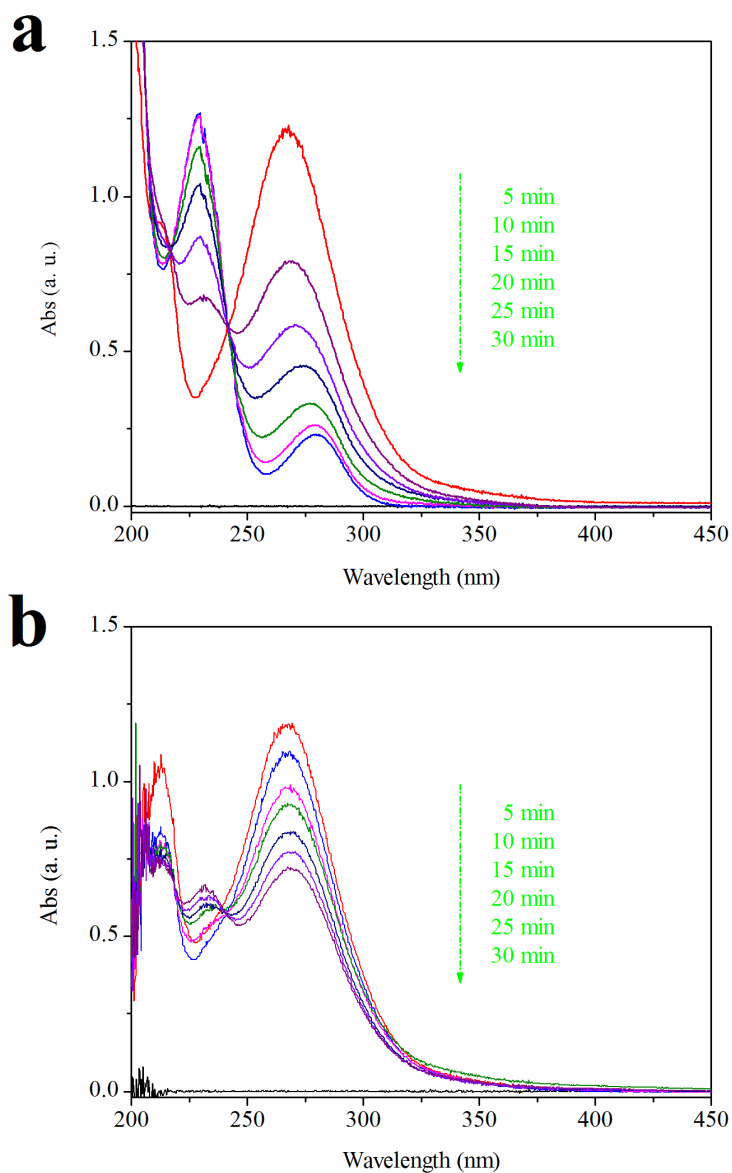


Fig. S6 XRD patterns of the Bi_2MoO_6 photocatalyst before and after the reaction.

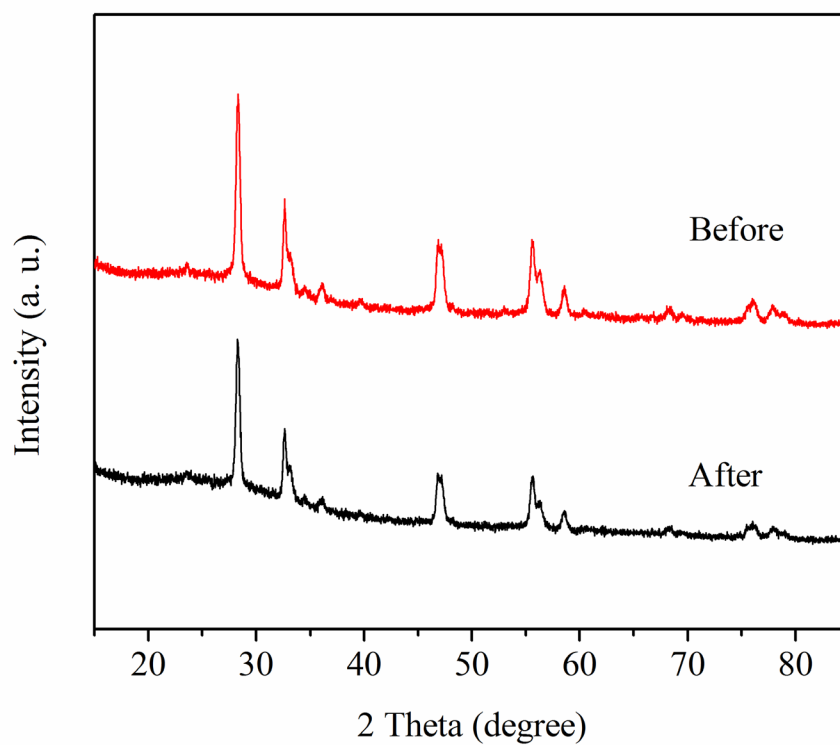


Fig. S7 Photocatalytic hydrogenation of nitrobenzene over the Bi_2MoO_6 photocatalyst in the presence of $(\text{NH}_4)_2\text{C}_2\text{O}_4$ as the hole scavenger without N_2 atmosphere.

