Electronic Supplementary Information

for

Highly efficient visible-light-induced photocatalytic hydrogenation of nitrobenzene to aniline in water

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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$_2$MoO$_6$ sample.
**Fig. S2** Liner relationship between the concentration (C) and the absorbance (A) at 229 nm for aniline.

![Graph showing the linear relationship between concentration and absorbance for aniline at 229 nm.](image)
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$_2$NH$_4$ and (b) (NH$_4$)$_2$C$_2$O$_4$. 
Fig. S6 XRD patterns of the Bi$_2$MoO$_6$ photocatalyst before and after the reaction.
Fig. S7 Photocatalytic hydrogenation of nitrobenzene over the Bi$_2$MoO$_6$ photocatalyst in the presence of (NH$_4$)$_2$C$_2$O$_4$ as the hole scavenger without N$_2$ atmosphere.