

## Supporting Information

### **One-pot synthesis of Schiff base compounds *via* photocatalytic reaction in the coupled system of aromatic alcohols and nitrobenzene using CdIn<sub>2</sub>S<sub>4</sub> photocatalyst**

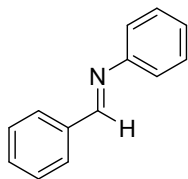
Xiangju Ye,<sup>a</sup> Yinghao Chen,<sup>a</sup> Cancan Ling,<sup>a,b</sup> Ran Ding,<sup>a</sup> Xuchun Wang,<sup>a</sup> Xuemei Zhang,<sup>a</sup> Shifu Chen<sup>a,b\*</sup>

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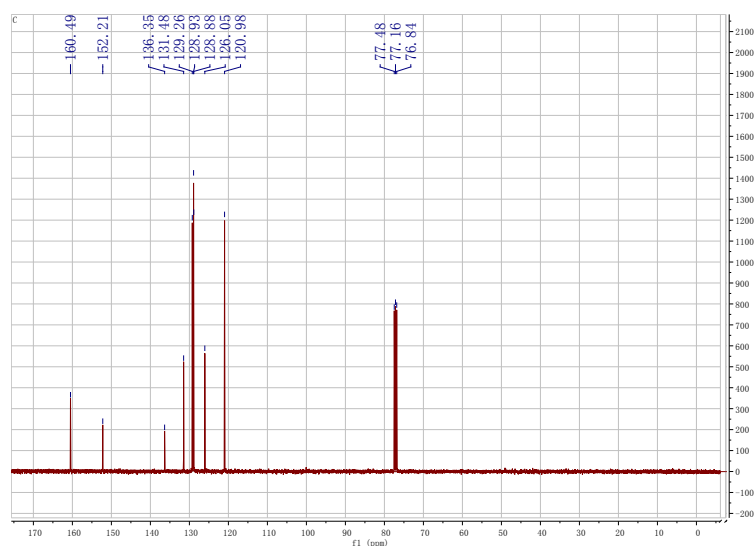
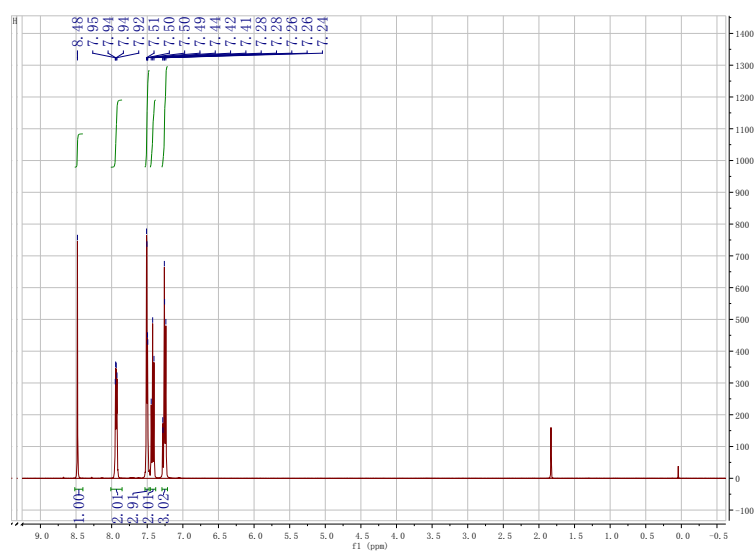
<sup>b</sup> Key Lab of Clean Energy and Green Circulation, Huaibei Normal University, Anhui Huaibei, 235000, P. R. China.

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## *N*-benzylideneaniline



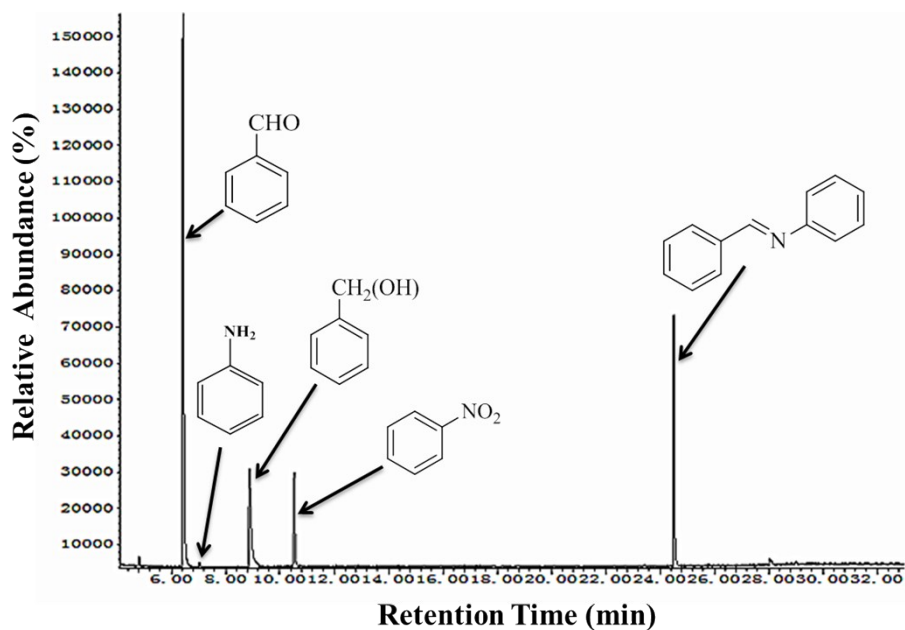
$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  8.48 (s, 1H), 7.94 (dd,  $J = 6.6, 3.1$  Hz, 2H), 7.50 (dd,  $J = 5.1, 1.8$  Hz, 3H), 7.42 (t,  $J = 7.8$  Hz, 3H), 7.29 – 7.22 (m, 3H).  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  160.49, 152.21, 136.35, 131.48, 129.26, 128.93, 128.88, 126.05, 120.98, 77.48, 77.16, 76.84.



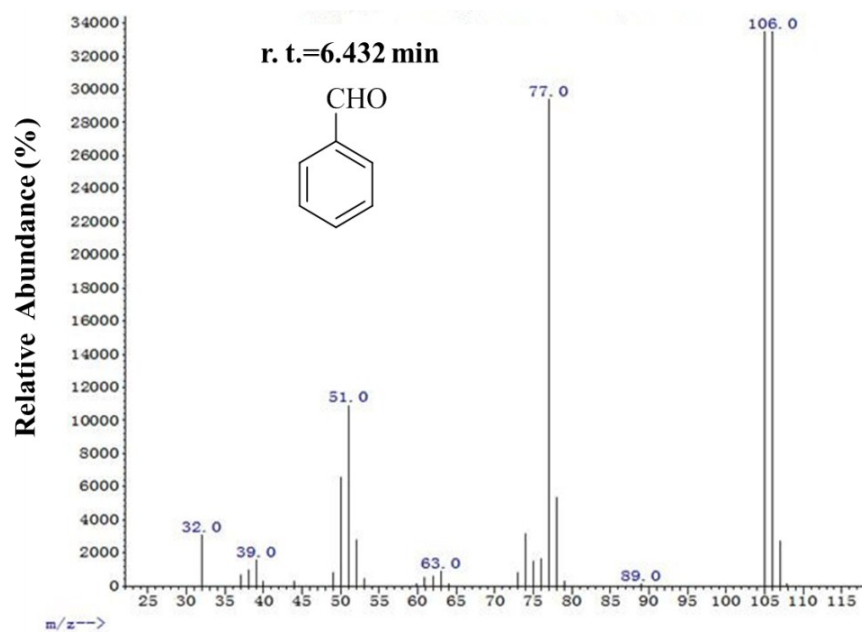
**Figure S1.**  $^1\text{H}$  and  $^{13}\text{C}$  NMR spectra of the as-synthesized *N*-benzylideneaniline product in the reaction system under visible light irradiation for 8 h.

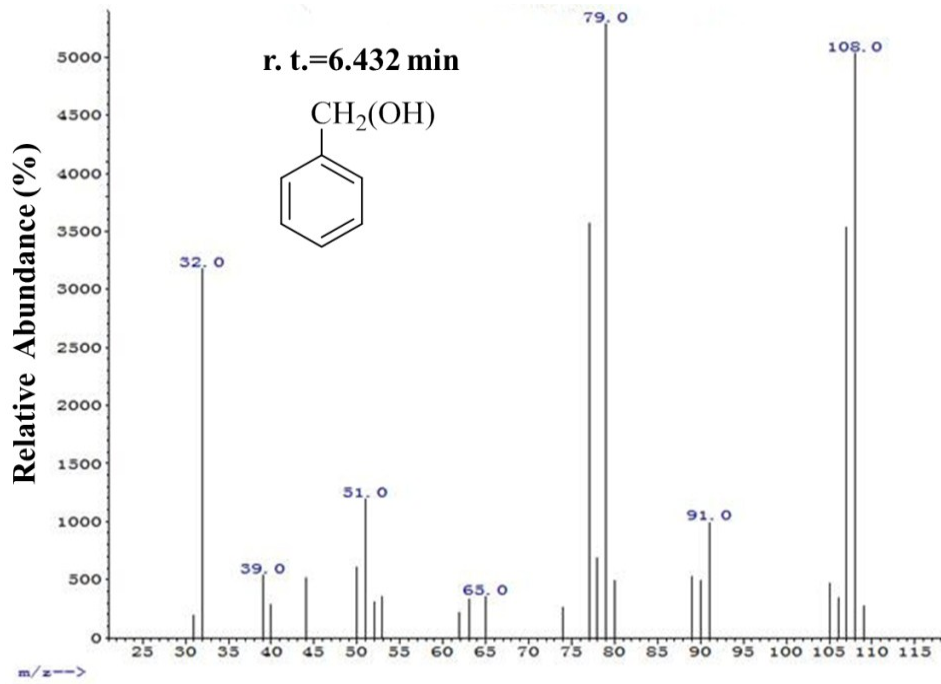
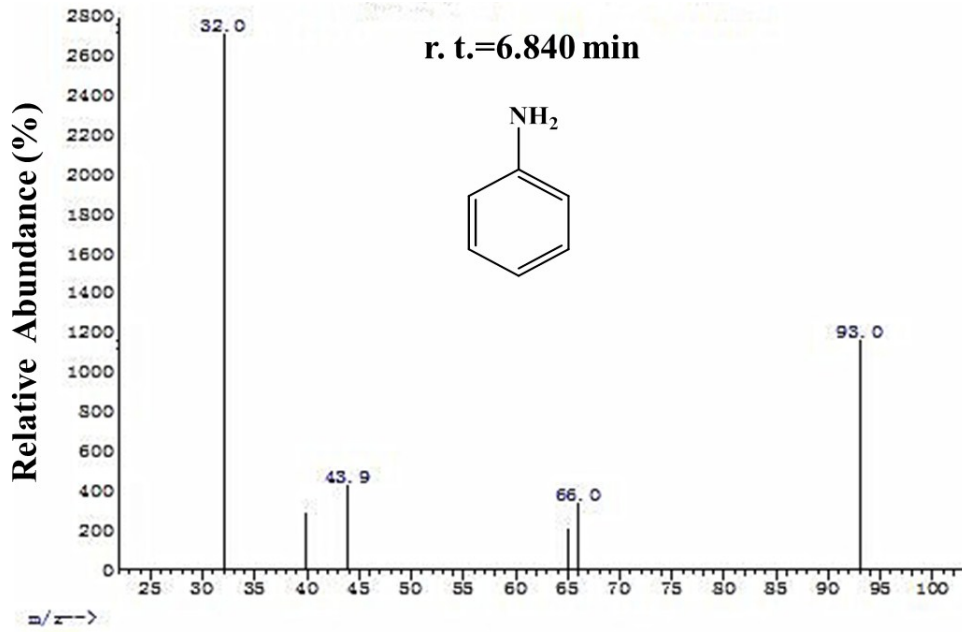
## GC and GC-MS data

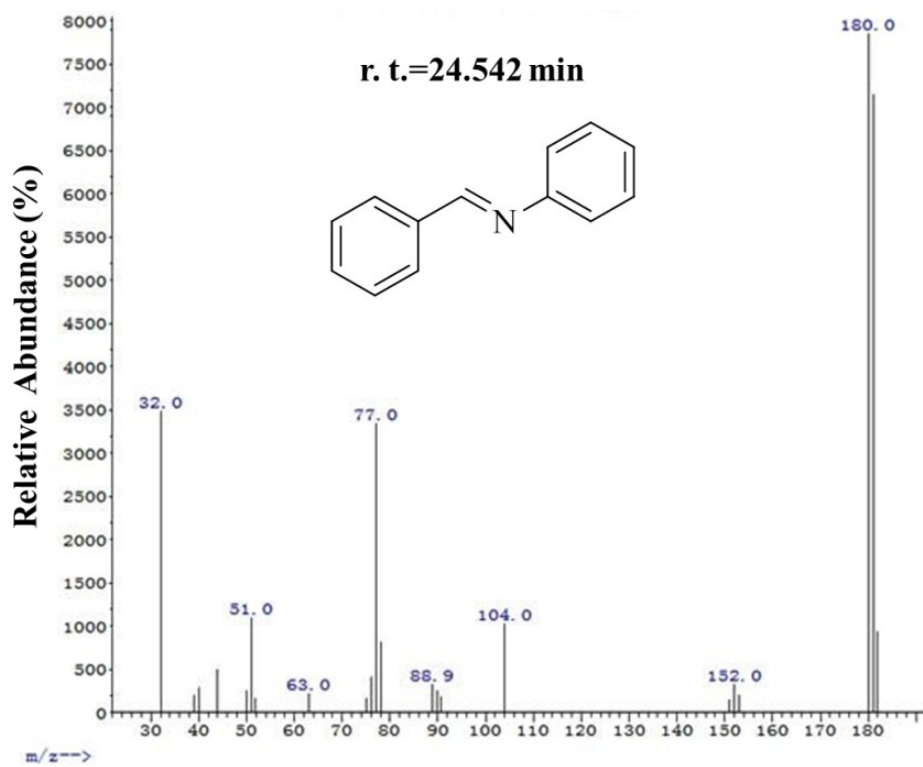
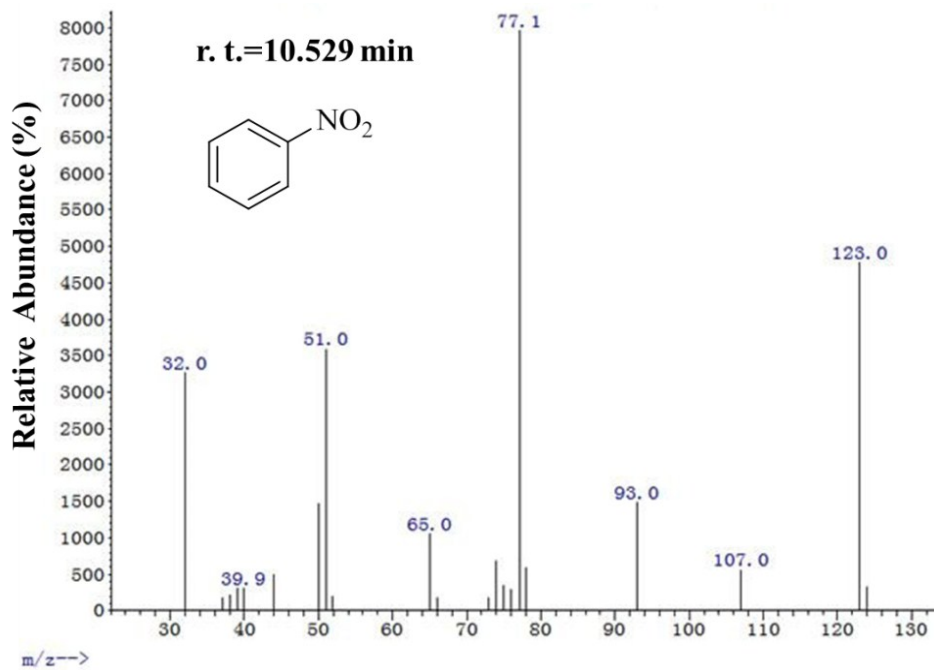
### GC data (after reaction)



### GC-MS

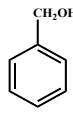
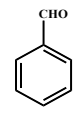
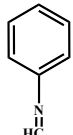
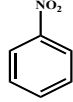
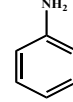
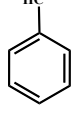




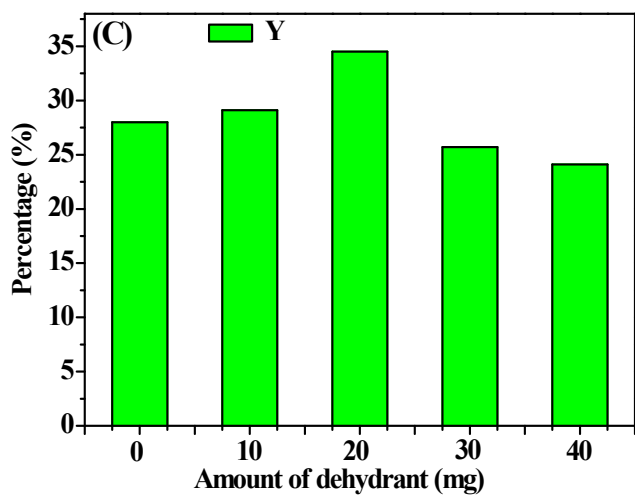
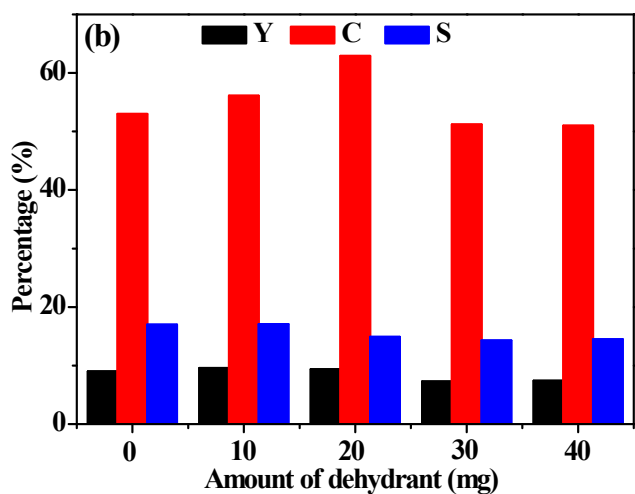
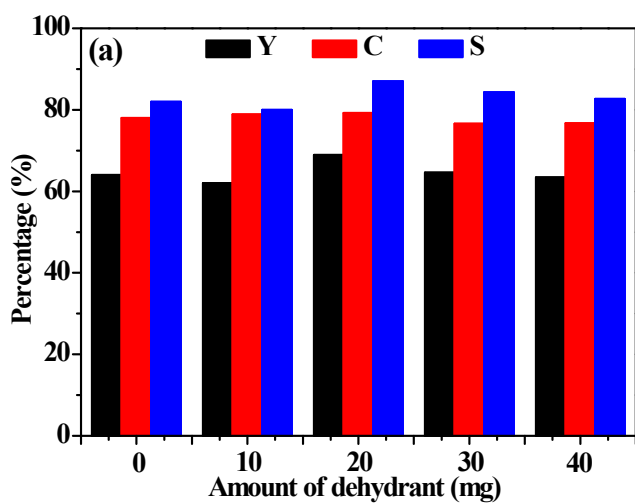


**Figure S2.** GC-MS spectra of the reaction solution under visible light irradiated for 8 h.

**Table S1.** Photocatalytic activity for Schiff base production in a coupled system of benzyl alcohol and nitrobenzene with/without visible light for 4 h.<sup>a</sup>

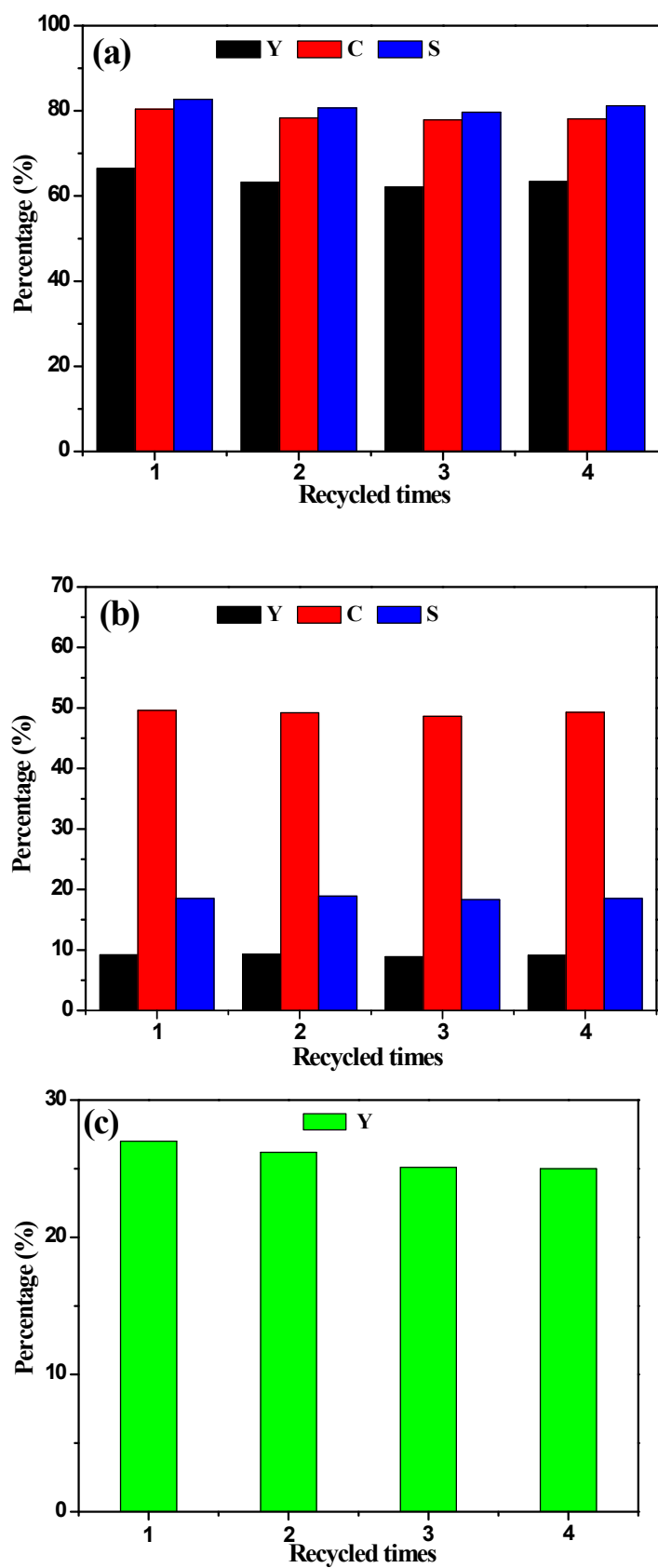
Entry	Substrates	Intermediates	Product	Oxidation reaction (%)			Reduction reaction (%)			Schiff base Product <sup>b</sup>
				Y	C	S	Y	C	S	
1 <sup>c</sup>				0	0	0	0	0	0	0
2 <sup>d</sup>				0	0	0	0	0	0	0

<sup>a</sup>Reaction conditions: benzyl alcohol (2.55 mol/L), nitrobenzene (8.5 mol/L), solvent (BTF, 15 mL), catalyst (80 mg), N<sub>2</sub> (0.1 Mpa), visible light irradiation ( $\lambda > 420$  nm). Herein, C, Y, and S are short for conversion, yield, and selectivity of the product, respectively. <sup>b</sup>Yield = moles of Schiff base compound/moles of initial nitrobenzene  $\times 100$ . <sup>c</sup>The reaction was carried out in dark. <sup>d</sup>The reaction was conducted without photocatalyst.



**Figure S3.** Photocatalytic performance for the selective oxidation of benzyl alcohol to benzaldehyde (a), reduction of nitrobenzene into aniline (b) and yields of *N*-benzylideneaniline (c)

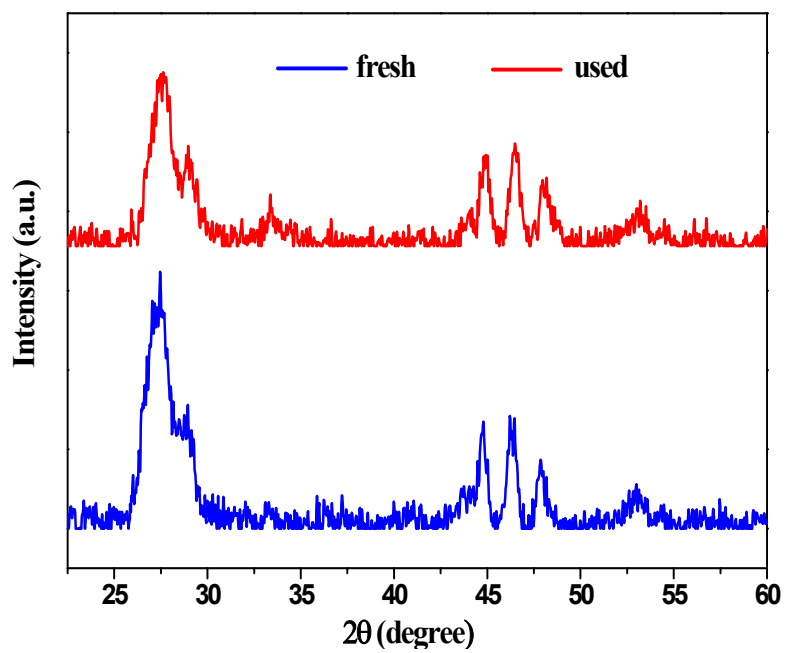
with different amounts of dehydrant under visible light irradiation ( $\lambda > 420$  nm) for 6 h.



**Figure S4.** Cyclic experiments for selective oxidation of benzyl alcohol to benzaldehyde (a), reduction of nitrobenzene into aniline (b), and yields of Schiff base (c) under visible light



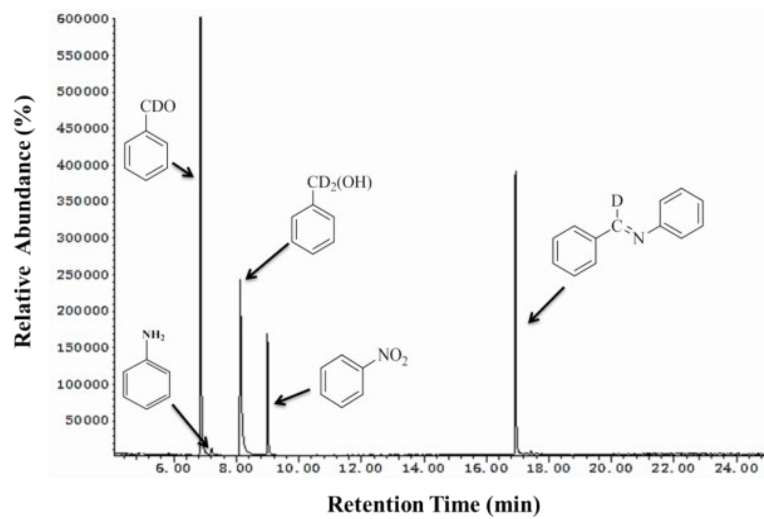
irradiation ( $\lambda > 420$  nm) under  $N_2$  purge condition for 6 h.



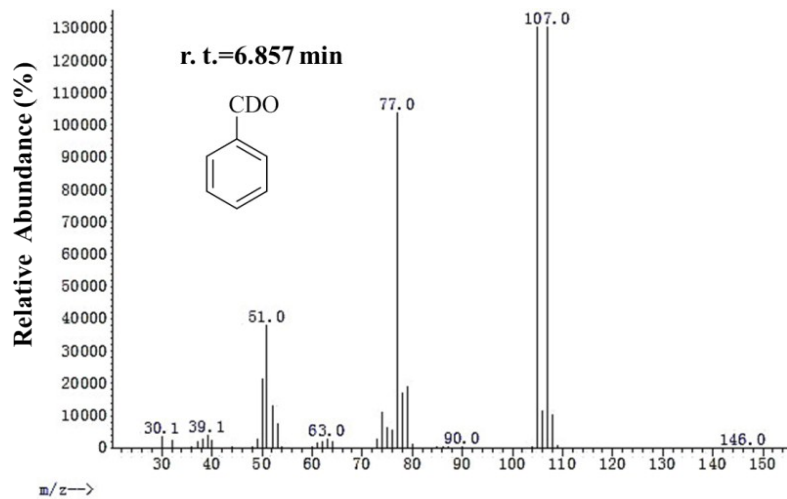
**Figure S5.** XRD patterns of CdIn<sub>2</sub>S<sub>4</sub> photocatalyst before and after the photocatalytic reactions.

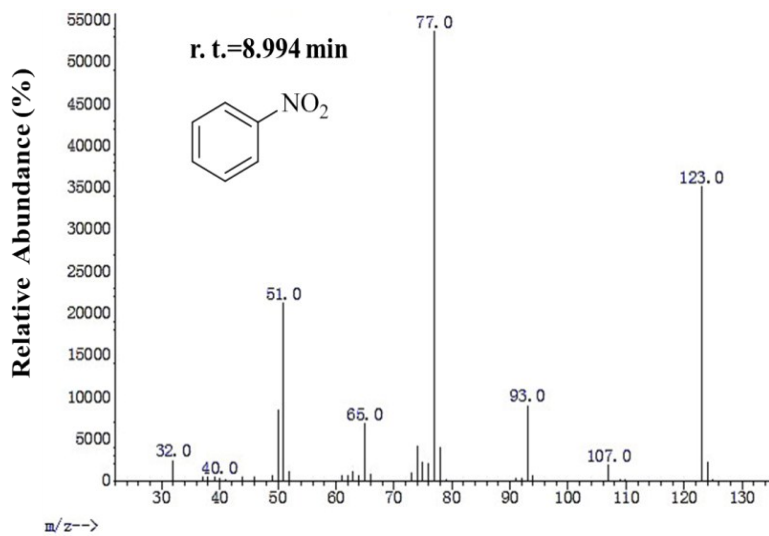
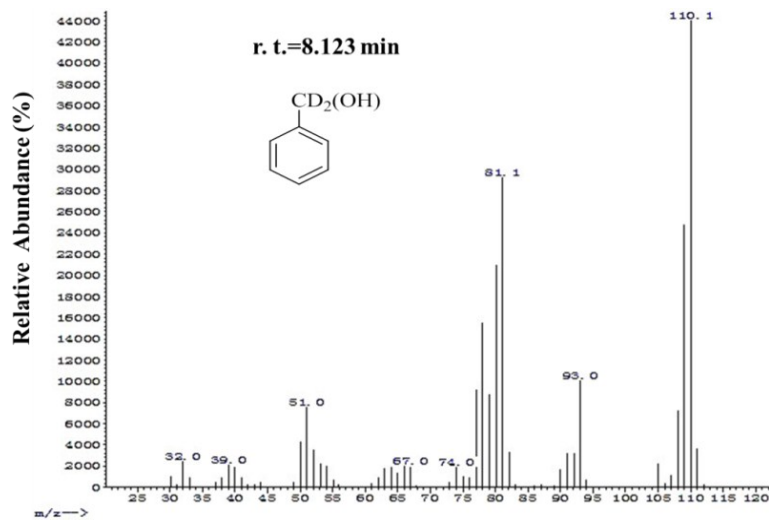
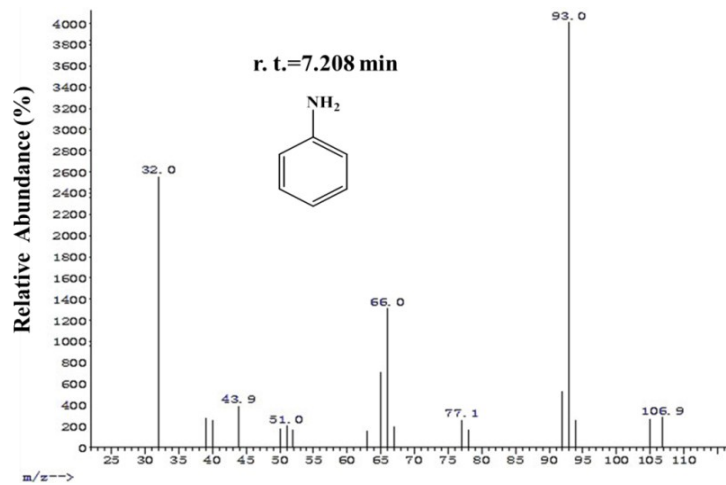
## GC and GC-MS data

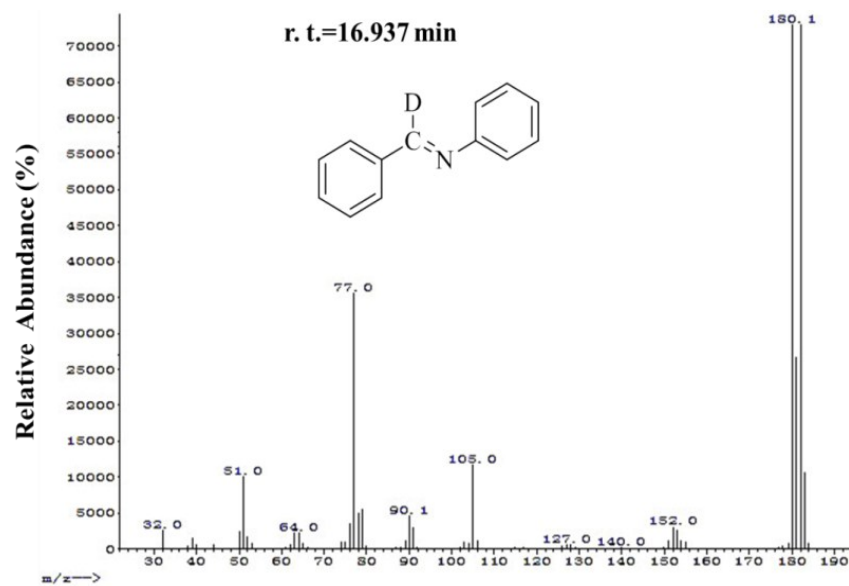
### GC data (after reaction)



### GC-MS







**Figure S6.** GC/GC-MS spectra of isotopic experiment for photocatalytic reaction in the coupled system of benzyl alcohol and nitrobenzene under visible light irradiation for 8 h.