Electronic Supplementary Material (ESI) for Photochemical & Photobiological Sciences.

New insight into efficient visible-light-driven photocatalytic organic transformation over CdS/TiO_2 photocatalysts

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Table S1. Progress achieved in the photocatalytic Aerobic Oxidation of benzyl alcohol to benzaldehyde under visible light

Sample	Solvent	Benzyl alcohol (mmol)	Time (h)	Conversion (%)/(g.h)	Selectivity (%)	Light source	Year
CdS/TiO_2-90	BTF	0.1	4	1407.2	>97.03	>420 nm	This work
Au/BiOCl-OV	Acetonitrile	0.5	8	189	>99	>420 nm	2017[1]
CdS	BTF	0.1	10	412.5	100	>420 nm	2012[2]
CdS/TiO_2 (001)	BTF	0.2	3	1055.6	100	>420 nm	2016[3]
$Pt@CeO_2$	BTF	0.1	5	925	>98	>420 nm	2011[4]
CdS/TiO_2 nanofiber	BTF	0.1	4	687.5	>99	>420 nm	2015[5]
CdS-Uio-66(NH_2)	BTF	0.1	4	941.2	>99	>420 nm	2013[6]
Mpg-C_3N_4	BTF	0.1	3	380	>99	400-800 nm	2010[7]
CdS/Graphene	BTF	0.1	4	1375	>99	>420	2011[8]
GO-$C_3N_3S_3$	BTF	0.5	8	214.6	100	>420	2014[9]

Table S2. BET specific surface area of the samples.

Sample	BET(m^2g^{-1})
TiO_2	201
CdS/TiO_2-30	163
CdS/TiO_2-60	155
CdS/TiO_2-90	148
CdS/TiO_2-120	136
Co-CdS	16

Table S3. Photocatalytic selective oxidation of various benzyl alcohols over CdS/TiO_2-90 under visible light irradiation for 4h.

Light(nm)	R	Atm	Conversion(%)	Selectivity(%)
420-800	F	O_2	40.04	89.63
420-800	NO_2	O_2	30.72	88.01
420-800	CH_3	O_2	61.05	> 99
420-800	CH_3O	O_2	79.22	> 99
420-800	H	O_2	44.2	95.2

Table S4. Photoreduction performances of 4-NA over sample Cd-Ti-90 under different conditions.

Catalyst	Hole scavebger	Atmosphere	Conversion(%)	Selectivity(%)
CdS/TiO_2-90	CH_3OH	N_2	-	-
CdS/TiO_2-90	$(NH_4)_2C_2O_4$	N_2	-	-
CdS/TiO_2-90	HCO_2NH_4	N_2	98.6	95.3
CdS/TiO_2-90	HCO_2NH_4	O_2	-	-
CdS/TiO_2-90	-	Air	-	-
-	HCO_2NH_4	N_2	-	-

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