Supplementary Materials

Selective heterogeneous photocatalytic activation for toluene oxidation: recent advances, challenges and perspective

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Supplementary Table 1. Performance comparison of various photocatalysts in the selective photooxidation of toluene

Photocatalyst	Reaction conditions					Catalytic Performance				
	Toluene Amount (mmol)	Photocatalyst Dosage (mg)	Solvent	Reaction Time (h)	Light Source (nm)	Conversion (%)	BAD Selectivity (%)	Conversion Rate (μmol g^{-1} h^{-1})	Ref.	Year
p-BWO	1	50	MeCN	2	λ > 400 nm	24	91	2162	[1]	2018
$Cd_3(TMT)_2$/CdS	9.5	50	No solvent	3	λ > 420 nm	1.3	98.5	799	[2]	2018
TiO_2/Bi_2MoO_6	10	50	No solvent	3	λ ≥ 400 nm	1.6	97.2	1066.7	[3]	2018
Bi_2MoO_6/g-C_3N_4	9.5	50	No solvent	3	λ ≥ 400 nm	1.3	98	868.1	[4]	2019
Fe-UiO-66	0.047	10	MeCN	2	λ > 380 nm	70.1	19.3	1647.4	[5]	2019
$Cs_3Bi_2Br_9$/SBA-15	47	10	No solvent	12	λ ≥ 420 nm	0.26	90	12600 (per $Cs_3Bi_2Br_9$)	[6]	2020

Pd/BiOBr	0.05	5	MeCN	5	$250 < \lambda < 1200$ nm (Full spectrum)	23.8	99	476.8	[7]	2020
Nb_2O_5-N	0.1	5	MeCN	12	$\lambda = 455$ nm	1.56	96	25	[8]	2020
$Cs_3Sb_2Br_9$	47	10	No solvent	4	$\lambda > 420$ nm	0.2	79	2520	[9]	2020
CdS	50	10	No Solvent	2	$\lambda > 420$ nm	0.2	85.3	500	[10]	2021
V_2O_5@CN	0.5	5	MeCN	42	$\lambda > 400$ nm	86.3	9.8	2055	[11]	2021
V_2O_5/CN	0.5	5	MeCN	42	$\lambda > 400$ nm	27.3	70.3	650	[11]	2021
$CdInS_4$-CdS	0.047	10	MeCN	6	$\lambda > 420$ nm	80.3	98.8	632	[12]	2021
Ce-Mo-O nanowires	0.1	10	Chloroform	16	$\lambda = 254$ nm	83.8	40.5	523.8	[13]	2022

$Bi_2W_{0.3}Mo_{0.7}O_6$	9.4	15	No solvent	5	$\lambda \geq 420$ nm	1.46	91	1810.4	[14]	2022
10% $Cs_3Bi_2Br_9$/g-C_3N_4	47	10	No solvent	3	$\lambda > 400$ nm	0.32	90	5033.3	[15]	2022
$(NH_3(CH_2)_3NH_3)_2AgBiBr_8$	0.05	5	MeCN	4	$\lambda > 400$ nm	64	92	1600	[16]	2023
Fe-PHI	0.188	25	MeCN	20	$\lambda = 410$ nm	32	96	120.3	[17]	2023
$Cs_2AgBiBr_6$/g-C_3N_4	0.66	10	MeCN	12	$\lambda > 420$ nm	15.5	96	852.5	[18]	2023
Zn-$Cs_2AgBrBr_6$	0.66	10	MeCN	20	$\lambda > 420$ nm	21.5	95	709.5	[19]	2023
$Cs_4ZnSb_2Cl_{12}$	9.4	10	Hexane	12	$\lambda > 420$ nm	2.58	95	1998	[20]	2023
CABB-80@UCNT	47	10	No solvent	2	$250 < \lambda < 1200$ nm (Full spectrum)	0.1	85.9	2630	[21]	2023

0.01BOC-TiO$_2$	10	25	No solvent	2	$\lambda > 320$ nm	2.3	81	4600	[22]	2023
Y$_1$/TiO$_2$	0.5	50	MeCN	4	$250 < \lambda < 1200$ nm (Full spectrum)	34	94.1	850	[23]	2023
Bi$_2$MoO$_6$-(010)	14.2	40	No solvent	5	$\lambda > 420$ nm	0.56	96	390.6	[24]	2023
CsPbBr$_3$/TiO$_2$	9.4	10	MeCN	2	$\lambda > 420$ nm	2.2	85	10200	[25]	2023
Bi$_4$O$_5$Br$_2$-SCNs	47	20	No solvent	2	$\lambda = 450$ nm	0.16	90	1877	[26]	2024
BT-48	24	15	No solvent	4	AM 1.5 G	1.8	96	7064	[27]	2024
Ni/Bi$_2$WO$_6$	0.1	10	MeCN	5	$\lambda > 400$ nm	48	99	960	[28]	2024
Bi$_2$MoO$_6$/Cs$_3$Sb$_2$Br$_9$	47	50	No solvent	4	$\lambda > 400$ nm	1.0	98	2346	[29]	2024

a-FePPA	28	15	No solvent	7	AM 1.5 G	0.1	95	288.4	[30]	2024
$Cs_3Bi_2Br_{9-x}$ @AgBr	94	10	No solvent	4	AM 1.5 G	0.33	91	6164.8	[31]	2024
EC-BiOBr	0.094	10	MeCN	2	AM 1.5 G	52.3	66	2460	[32]	2024

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