catalysts

Supporting Information

Efficient photocatalytic CO_2 reduction with MIL-100(Fe)-$CsPbBr_3$ composites

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Supplementary Figures and Tables

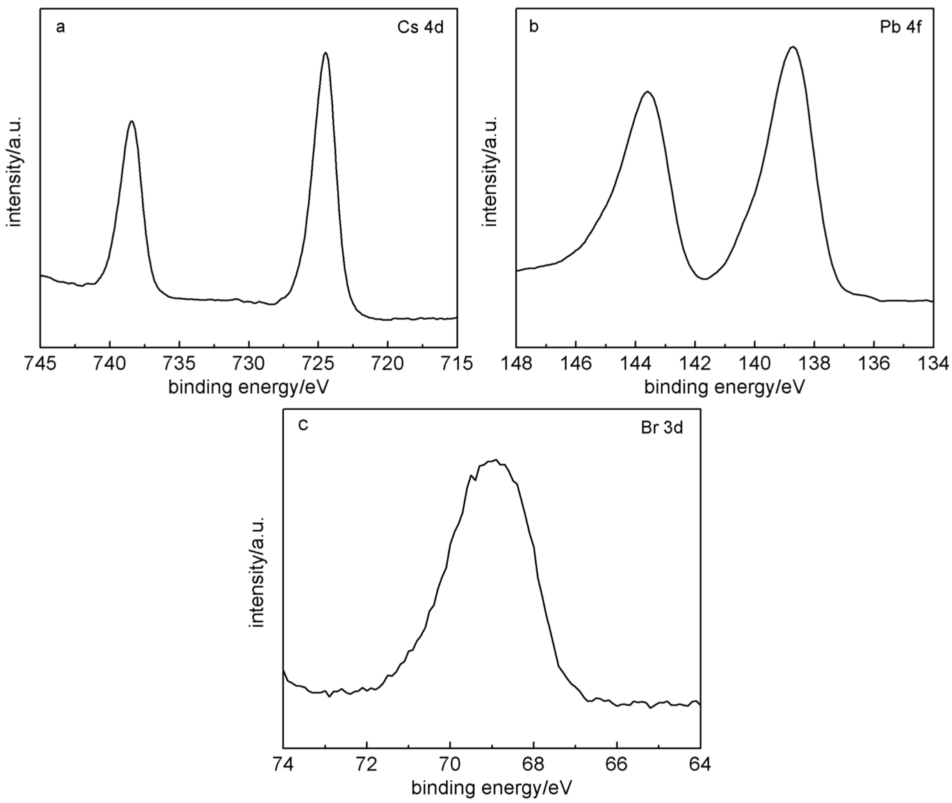

Figure S1. XPS spectra of p-90Fe: (a) Cs 3d, (b) Pb 4f and (c) Br 3d.

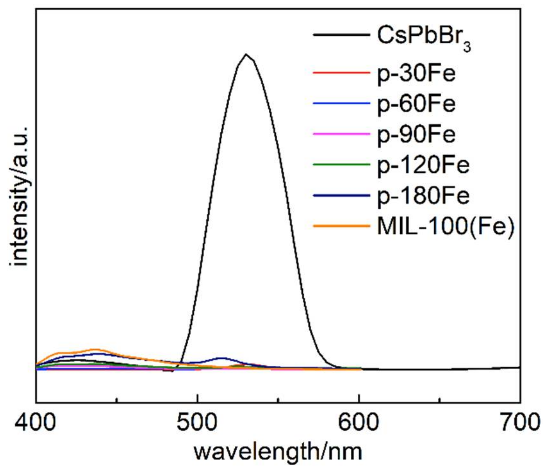

Figure S2. Photoluminescence spectra of the as-prepared samples at an excitation wavelength of 380 nm.

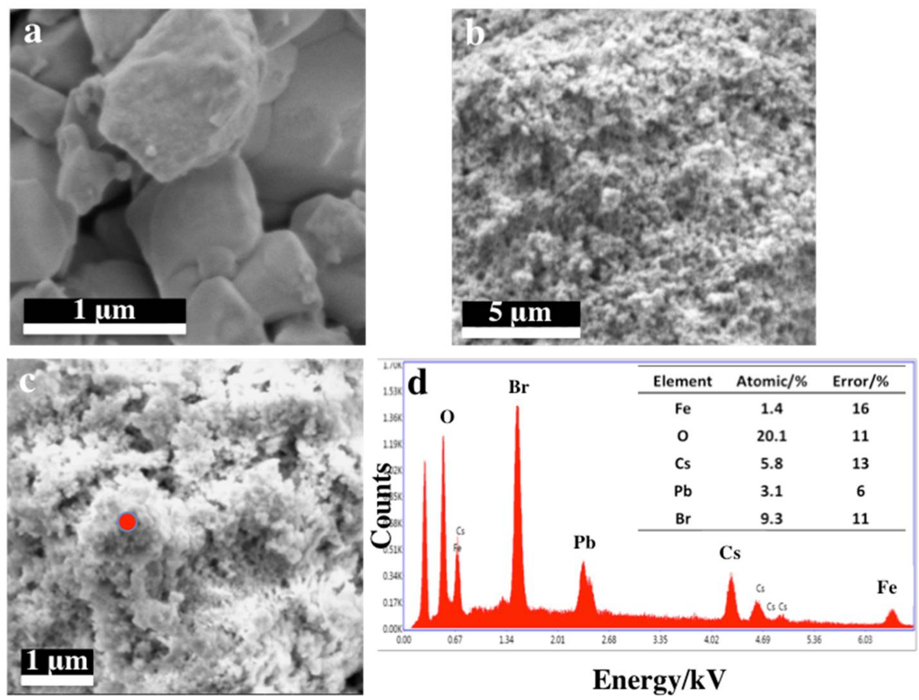

Figure S3. Typical SEM images of (a) $CsPbBr_3$, (b) MIL-100(Fe), (c) p-90Fe and (d) EDS pattern of the selected region in (c) p-90Fe.

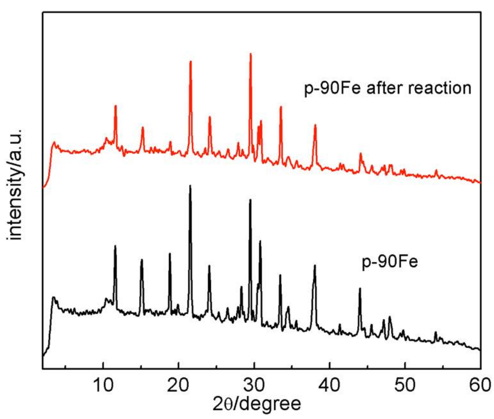

Figure S4. XRD pattern of p-90Fe before and after a 16 h photocatalytic reaction.

Table S1. Summary of the reported photocatalytic CO_2 reduction performance of perovskite-based and traditional photocatalysts under various illumination conditions.

Catalyst	System	Light source	Major product	$R_{electrons}$ (μmol/g/h)	Ref
$CsPbBr_3$	H_2O vapor	300 W Xe lamp visible light (>420 nm)	CO	9	This work
MIL-100(Fe)				10	
$CsPbBr_3$/MIL-100(Fe)				41	
		300 W Xe lamp full spectrum		59	
$CsPbBr_3$ QD	H_2O vapor	100 W Xe lamp AM 1.5G	CH_4 (minor CO)	11	[1]
ZIF-8				2	
ZIF-67				4	
$CsPbBr_3$/ZIF-8				15	
$CsPbBr_3$/ZIF-67				30	
$CsPbBr_3$ QD	ethyl acetate	100 W Xe lamp AM 1.5G	CO (minor CH_4)	24	[2]
$CsPbBr_3$ QD/GO				30	
$CsPbBr_3$ QD/ UiO-66-NH_2	H_2O/ethyl acetate	300 W Xe lamp visible light (>420 nm)	CO (trace CH_4)	19	[3]
UiO-66-NH_2				1	
UiO-66-NH_2	CO_2/H_2	150 W Xe lamp, $\lambda > 325$ nm	CO	3	[4]
g-C_3N_4	H_2O vapor	300 W Xe lamp visible light (>420 nm)	CO	14	[5]
Bi_2WO_6/g-C_3N_4	H_2O vapor	300 W Xe lamp visible light (>420 nm)	CO	10	[6]
bulk g-C_3N_4	MeCN/TEOA	300 W Xe lamp visible light (>400 nm)	CO	4	[7]
g-C_3N_4 nanosheets				6	
UiO-66				0	
UiO-66/g-C_3N_4 nanosheets				20	
anatase TiO_2	H_2O vapor	300 W Xe lamp full spectrum	CH_4	24	[8]
anatase TiO_2	H_2O vapor	300 W Xe lamp full spectrum	CO	8	[9]
ZIF-L				1	
TiO_2/C@ZnCo-ZIF-L				57	
Cu-BTC	H_2O vapor	300 W Xe lamp UV(<400 nm)	CH_4	0	[10]
Cu-BTC/TiO_2				8	
WO_3	H_2O	300 W Xe lamp visible light (>420 nm)	CH_4	9	[11]
MIL-125(Ti)-NH_2	H_2O vapor	300 W Xe lamp visible light (>420 nm)	CH_4	3	[12]
MIL-101(Fe)	MeCN/TEOA	300 W Xe lamp visible light (>420 nm)	$HCOO^-$	294	[13]
MIL-101(Fe)-NH_2				890	
MIL-53(Fe)				148.4	
MIL-53(Fe)-NH_2				232.4	
MIL-88B(Fe)				45	
MIL-88B(Fe)-NH_2				150	

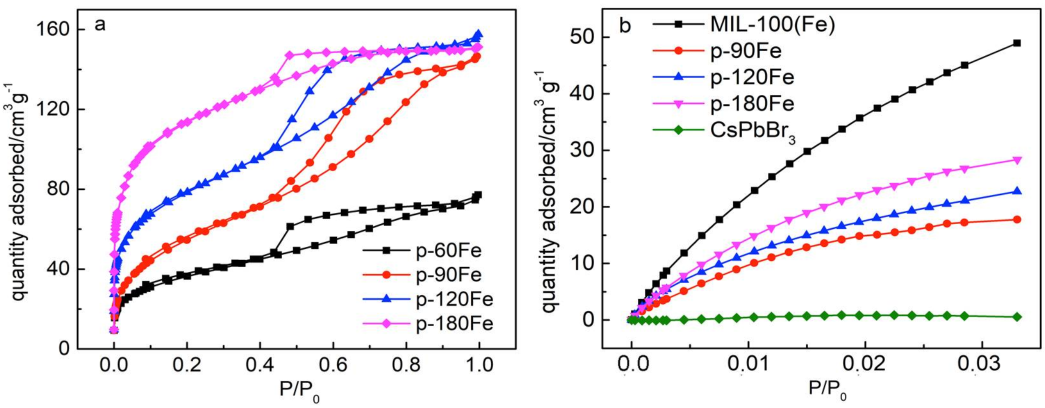

Figure S5. (a) N_2 adsorption-desorption isotherms and (b) CO_2 adsorption isotherms of the photocatalysts.

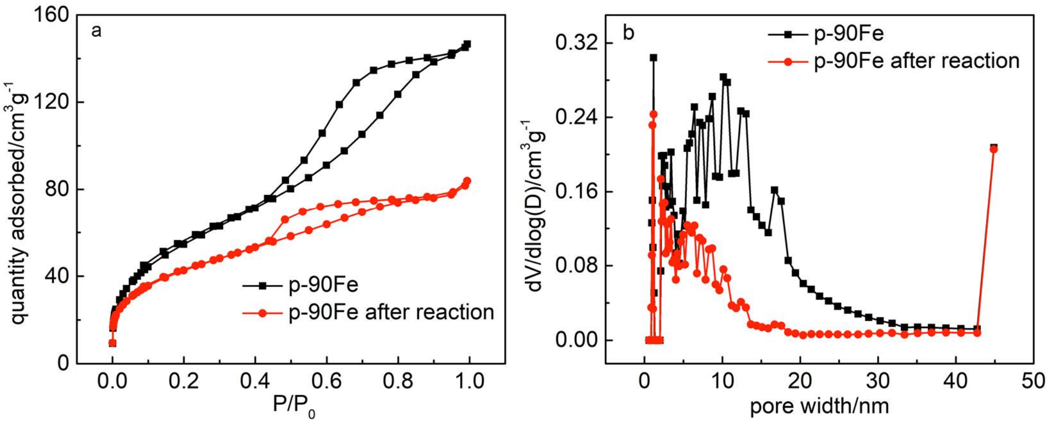

Figure S6. (a) N_2 adsorption-desorption isotherms and (b) pore size distribution curves of the p-90Fe before and after reaction.

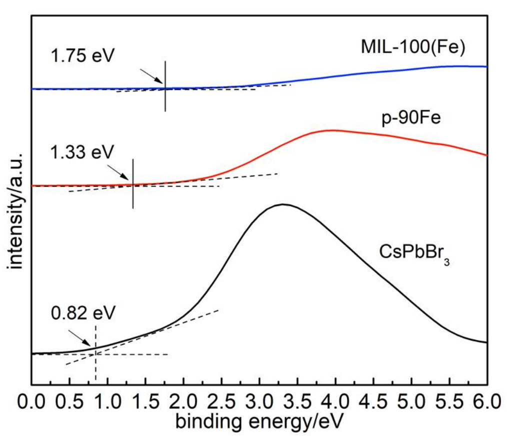

Figure S7. Valence band XPS spectra of MIL-100(Fe), $CsPbBr_3$ and p-90Fe.

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