Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Supporting Information

Boosted charge transfer and CO_2 photoreduction by construction of S-scheme heterojunction between $Cs_2AgBiBr_6$ nanosheets and two-dimensional metal-organic frameworks

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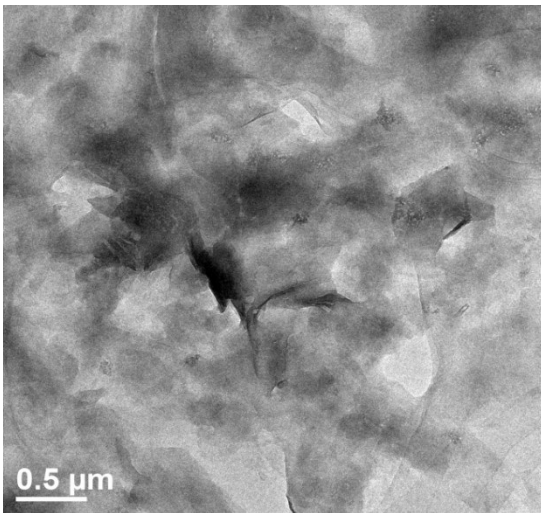

Figure S1 TEM image of the as-prepared Ni-MOF NSs.

Figure S2 High-angle annular dark-field (HAADF) image and EDX elemental mappings of C, O, and Ni elements in Ni-MOF.

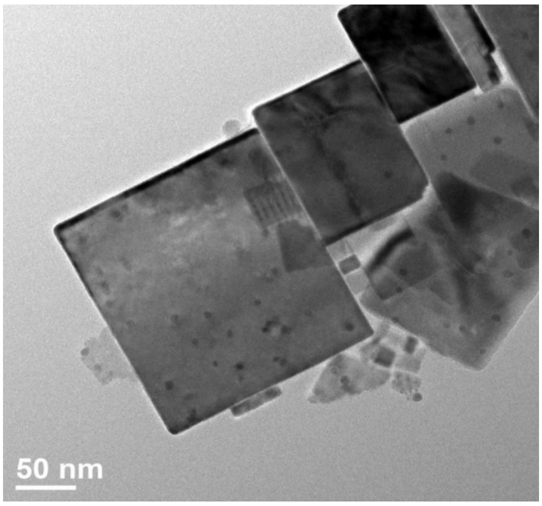

Figure S3 TEM image of the as-prepared CABB NSs.

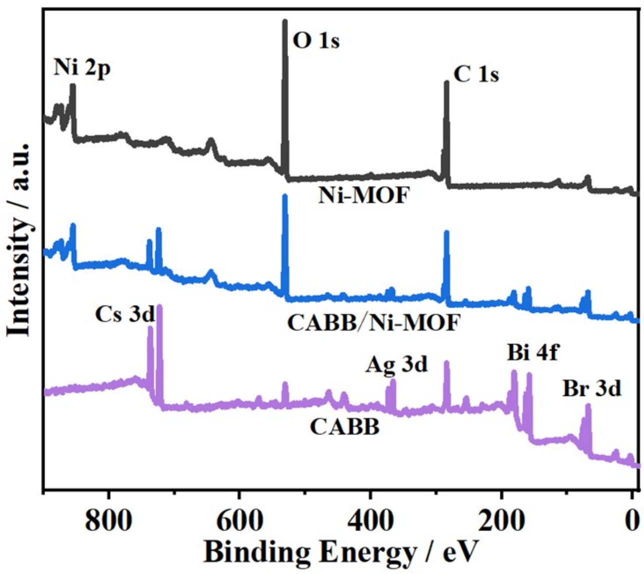

Figure S4 XPS survey spectra of CABB NSs, Ni-MOF NSs, and the CABB/Ni-MOF hybrid.

Figure S5 Time courses of (a) CO and (b) CH_4 evolution by CABB NSs, Ni-MOF NSs, and the CABB/Ni-MOF hybrids.

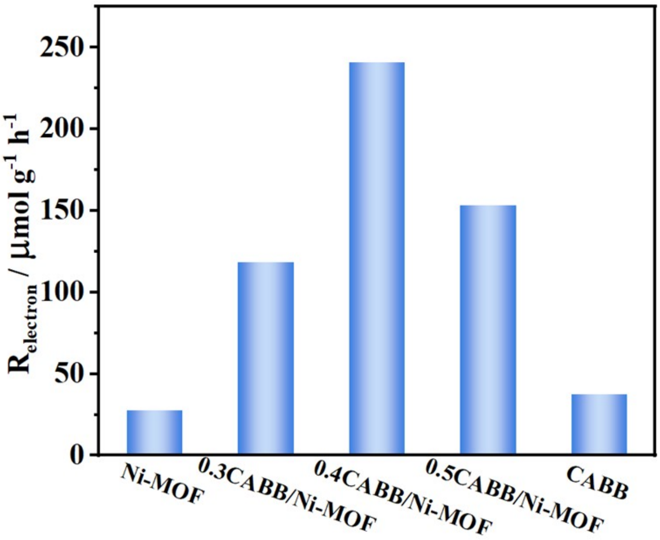

Figure S6 Comparison of $R_{electron}$ values of CABB NSs, Ni-MOF NSs, and the CABB/Ni-MOF hybrids.

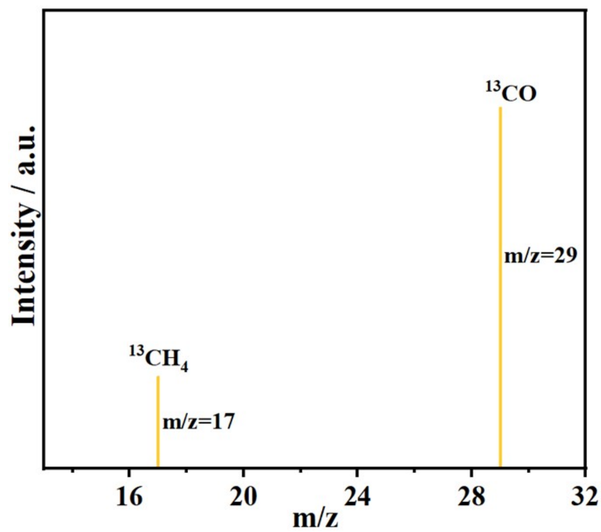

Figure S7 Mass spectra showing ^{13}CO and $^{13}CH_4$ produced over CABB/Ni-MOF hybrid in the photocatalytic reduction of $^{13}CO_2$.

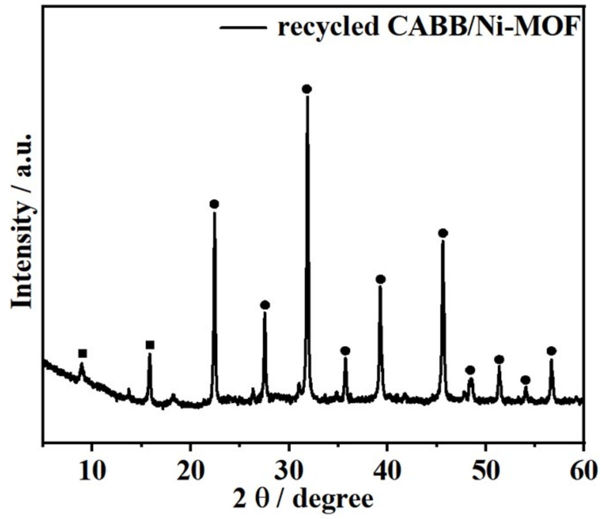

Figure S8 XRD pattern of the recycled CABB/Ni-MOF hybrid.

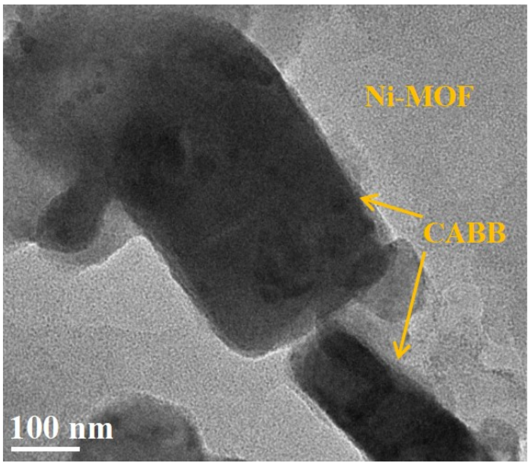

Figure S9 TEM image of the recycled CABB/Ni-MOF hybrid.

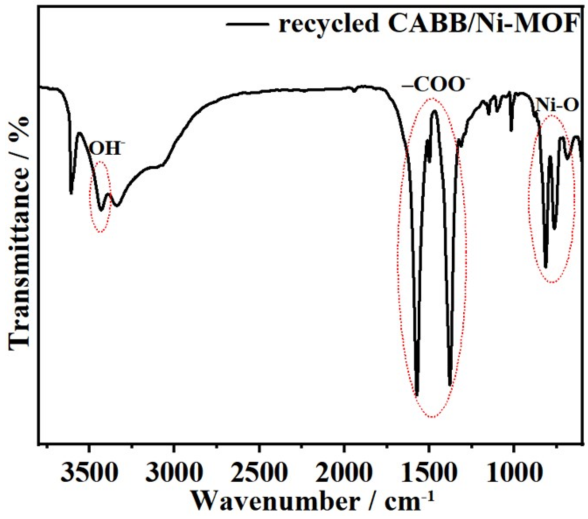

Figure S10 FTIR spectrum of the recycled CABB/Ni-MOF hybrid.

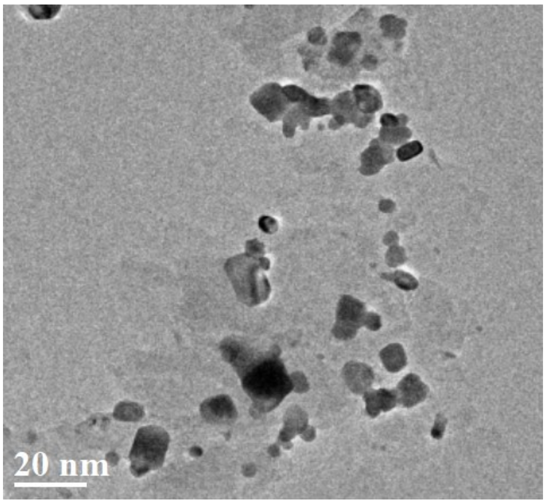

Figure S11 TEM image of the 0D/2D CABB/Ni-MOF hybrid.

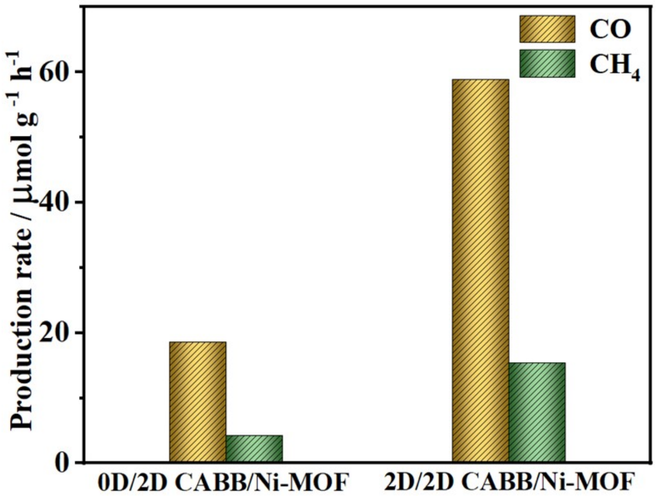

Figure S12 Comparison of photocatalytic CO_2 reduction activities of the 0D/2D and 2D/2D CABB/Ni-MOF hybrids.

Table S1 A comparison of the photocatalytic CO_2 reduction performances by various perovskite-based photocatalysts.

Photocatalyst	Light source	Products	$R_{electron}$ (μmol g^{-1} h^{-1})	Ref.
CABB/Ni-MOF	300 W Xe lamp	CO, CH_4	241.14	this work
$Cs_2AgBiBr_6$ NCs	100 W Xe lamp	CO, CH_4	16.2	1
$Cs_2AgBiBr_6$ NPLs	405 nm laser diode	CO, CH_4	42.6	2
$Cs_2AgBiBr_6$ – Cu – RGO	300 W Xe lamp	CO, CH_4, H_2	93	3
$Cs_2AgBiBr_6$/CTF-1	300 W Xe lamp	CO, CH_4	130.2	4
$Cs_2AgBiBr_6$@M-Ti	300 W Xe lamp	CO, CH_4	271.6	5
$CsPbBr_3$ QDs/GO	100 W Xe lamp	CO, H_2, CH_4	29.8	6
$CsPbBr_3$ QDs/g-C_3N_4	300 W Xe lamp	CO	149	7
P3HT/$CsPbBr_3$	300 W Xe lamp	CO, CH_4	475.3	8
C_{60}/$CsPbBr_3$	300 W Xe lamp	CO, CH_4	90.2	9
$CsPbBr_3$/MWCNT	300 W Xe lamp	CO, CH_4	116.2	10
$CsPbBr_3$ NCs/UiO-66(NH_2)	300 W Xe lamp	CO, CH_4	18.5	11
$CsPbBr_3$ QDs/Bi_2WO_6 NS	300 W Xe lamp	CO, CH_4	114.4	12
$CsPbBr_3$ NCs/BP NS	200 W Xe lamp	CO, CH_4	175.0	13
$CsPbBr_3$/CTF-1	300 W Xe lamp	CO	48.2	14
$CsPbBr_3$ NCs/MXene	300 W Xe lamp	CO, CH_4	110.6	15
$CsPbBr_3$ NCs@a-TiO_2	150 W Xe lamp	H_2, CO, CH_4	64.5	16
$CsPbBr_3$ NCs@ZIF-67	100 W Xe lamp	CO, CH_4	29.6	17
$CsPbBr_3$-Re$(CO)_3$Br(dcbpy)	150 W Xe lamp	H_2, CO	73.34	18
$CsPbBr_3$ NCs/ZnO/RGO	150 W Xe lamp	CO, CH_4	52.0	19
α-Fe_2O_3/RGO/$CsPbBr_3$	150 W Xe lamp	H_2, CO, CH_4	81.0	20
2D/2D $CsPbBr_3$/Bi_2WO_6	150 W Xe lamp	H_2, CO, CH_4	137.1	21
$CsPbBr_3$ NCs/MoS_2 NS	300 W Xe lamp	CO, CH_4	152.4	22
$CsPbBr_3$ NCs/Pd NS	150 W Xe lamp	H_2, CO, CH_4	33.8	23
$CsPbBr_3$-Au	100 W Xe lamp	CO, CH_4	47.7	24
$CsPbBr_3$-Ni(tpy)	300 W Xe lamp	CO, CH_4	1252	25

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