

Supporting Information

Photoelectric properties of layered raspberry sandwich amorphous ZnCo₂S₄@MnCo₂S₄/CP composite counter electrode in semiconductor-sensitized solar cells

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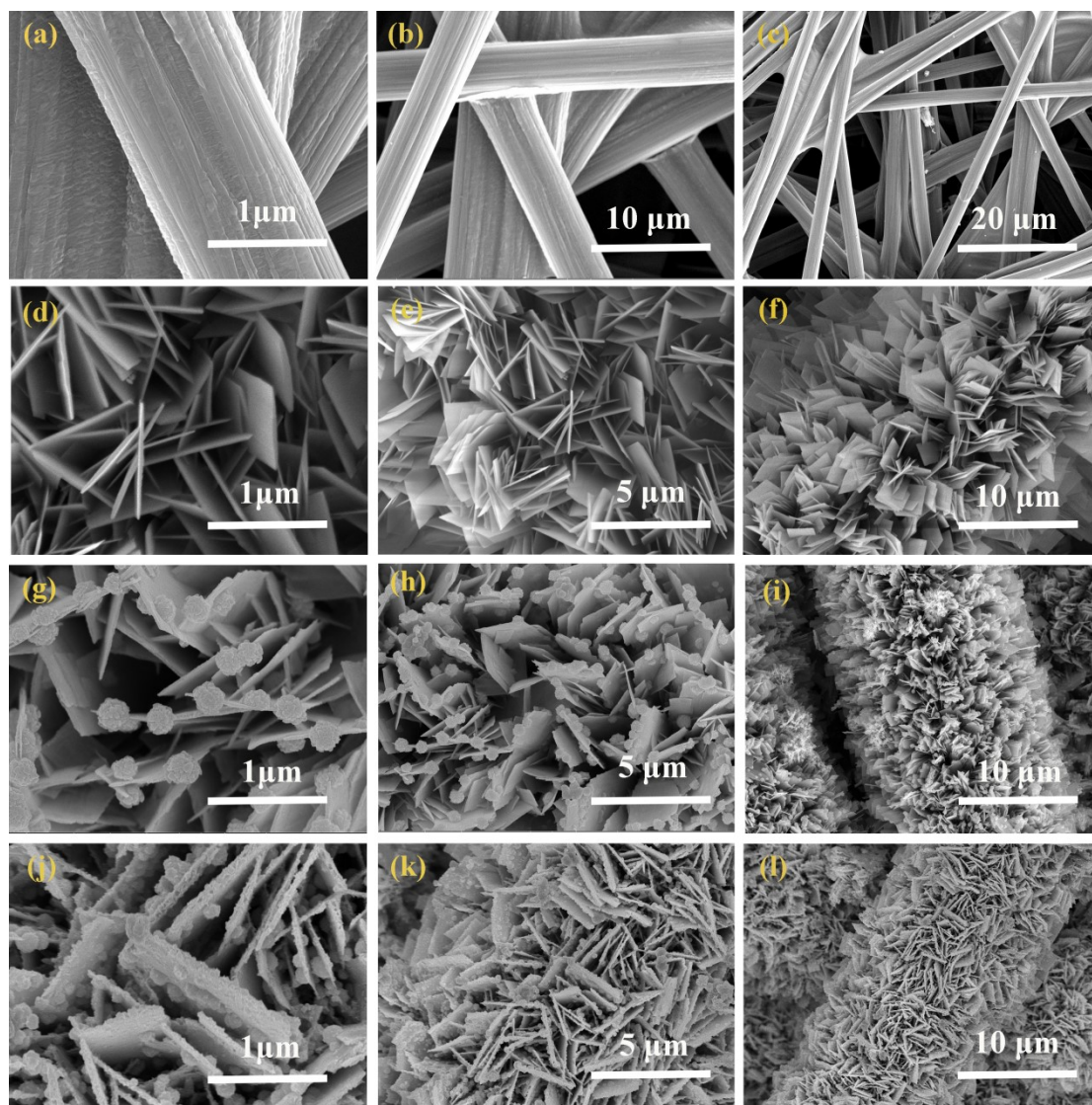


Figure S1 SEM images at different magnifications of CP, ZC-LDH/CP, ZC-LDH@MC-LDH/CP and ZCS@MCS/CP.

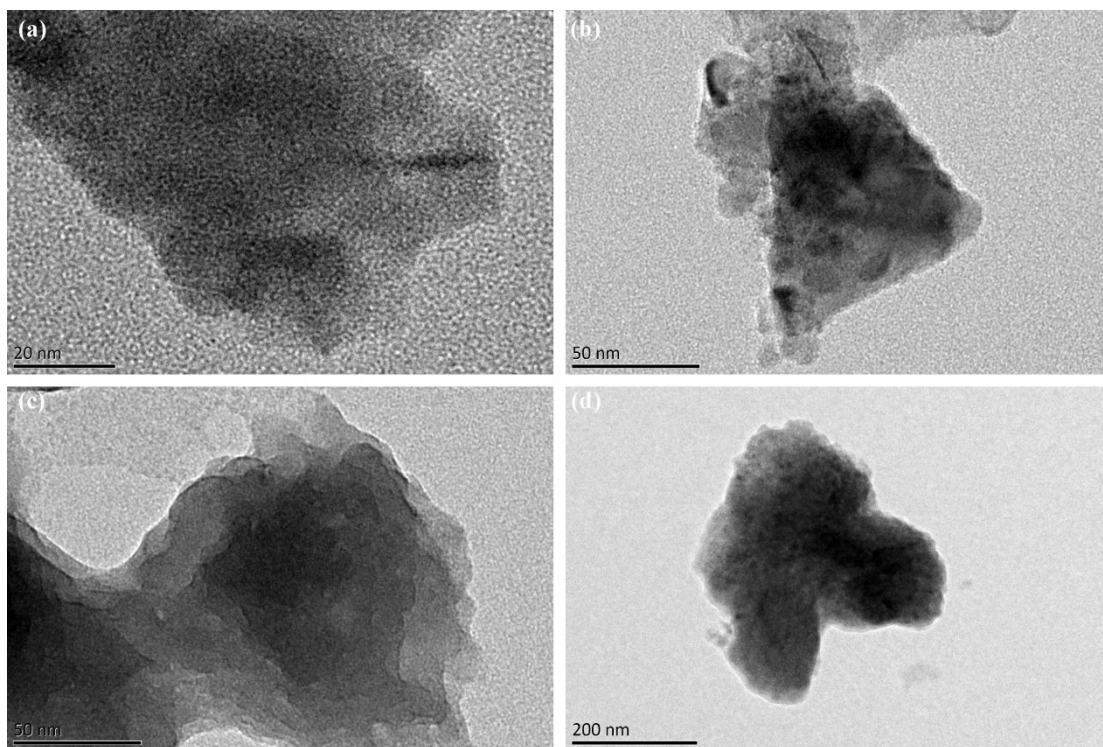


Figure S2 HRTEM plots of ZCS@MCS/CP at different magnifications.

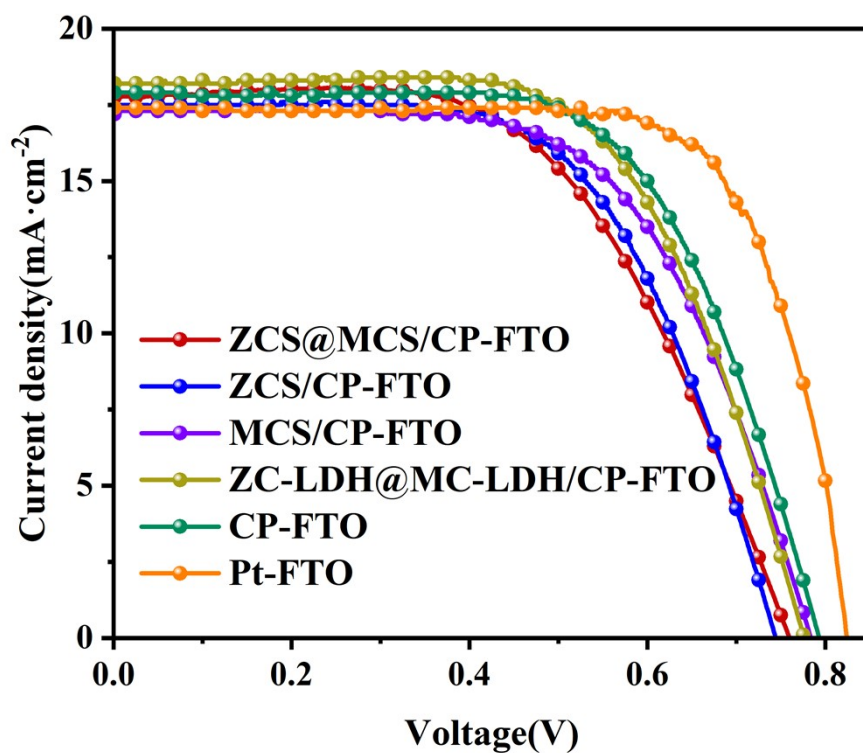


Figure S3 J-V curve of conductive glass substrate of each composite.

Table S1 J-V curve test data of conductive glass substrate of each composite material.

CEs	$V_{oc}(V)$	$J_{sc}(mA \cdot cm^{-2})$	FF	PCE(%)
ZCS@MCS/CP-FTO	0.824±0.22	17.44±0.12	0.74±0.10	10.60
ZCS/CP-FTO	0.791±0.12	17.93±0.16	0.64±0.08	9.13
MCS/CP-FTO	0.776±0.11	18.17±0.14	0.64±0.07	8.99
ZC@MC-LDH/CP-FTO	0.784±0.16	17.25±0.18	0.63±0.07	8.37
CP-FTO	0.745±0.08	17.42±0.11	0.62±0.03	7.99
Pt-FTO	0.760	17.74±0.21	0.57	7.71