

SUPPORTING INFORMATION

AQUEOUS SYNTHESIS OF COMPOSITION TUNED DEFECTS OF CUINSE₂ NANOCRYSTALS FOR ENHANCED VISIBLE-LIGHT PHOTOCATALYTIC H₂ EVOLUTION

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Table

Table S1. The EDS apparent concentration of CISE QDs with various Cu/In ratios

sample	Cu	In	Cu/In
CISE-1/4 nucleus	4.12	21.04	0.195
CISE-1/16	0.64	10.37	0.061
CISE-1/8	1.55	13.60	0.114
CISE-1/4	2.76	12.63	0.218
CISE-1/2	2.41	5.52	0.436

Table S2. PL life time by fitting experimental data with double exponential model of CISe

sample	τ_1 (ns)	%	τ_2 (ns)	%	τ (ns)
CISe-1/4 (620 nm)	23.33	12.40	192.13	87.60	171.19
CISe-1/4 (760 nm)	33.88	9.97	254.05	90.03	232.09
CISe-1/8 (620 nm)	28.29	18.92	179.6	81.08	150.97
CISe-1/16 (610 nm)	4.91	48.29	44.18	51.71	25.21

Table S3. The $E_{\text{gap}}^{\text{el}}$, $E_{\text{gap}}^{\text{opt}}$ and $J_{\text{e/h}}$ of CISe QDs with various Cu/In ratios

sample	CISe-1/4 nucleus	1/16	1/8	1/4	1/2
$E_{\text{gap}}^{\text{el}}$ (determined by CV eV)	2.57	2.20	2.14	2.21	2.02
$E_{\text{gap}}^{\text{opt}}$ (determined by absorption)	3.1	2.43	2.36	2.23	2.18
$J_{\text{e/h}}$	0.53	0.23	0.22	0.02	0.16

Figure

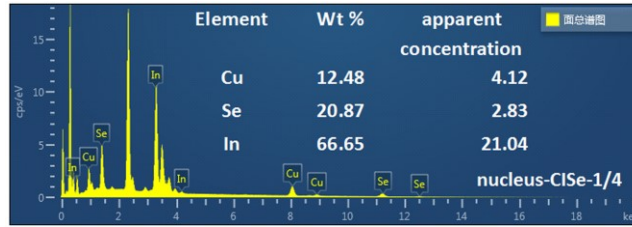


Figure S1.EDS of CISe-1/4 nucleus

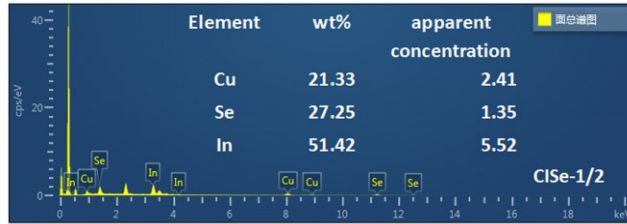


Figure S2.EDS of CISe-1/2

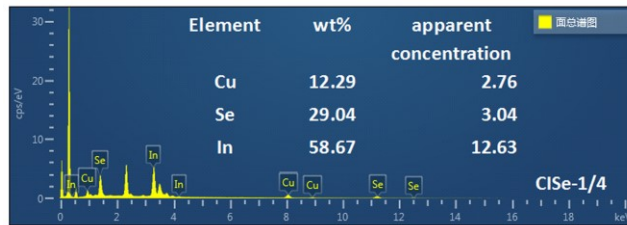


Figure S3.EDS of CISe-1/4

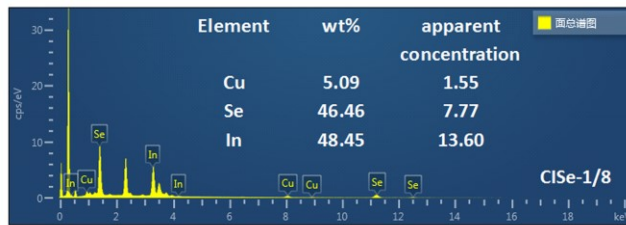


Figure S4.EDS of CISE-1/8

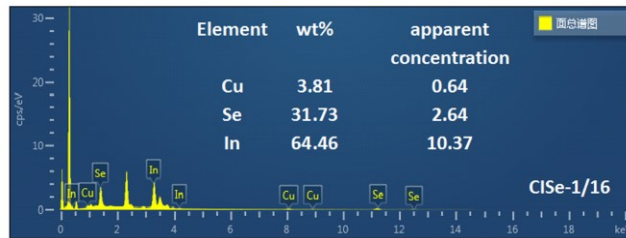


Figure S5.EDS of CISE-1/16

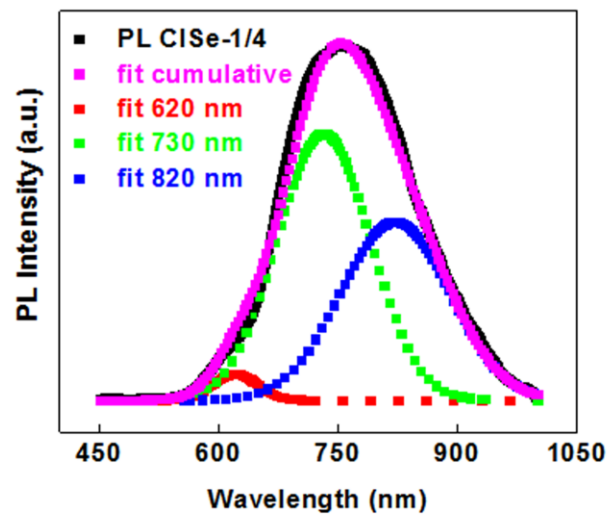


Figure S6. PL spectra peak separation fitting of CISE-1/4

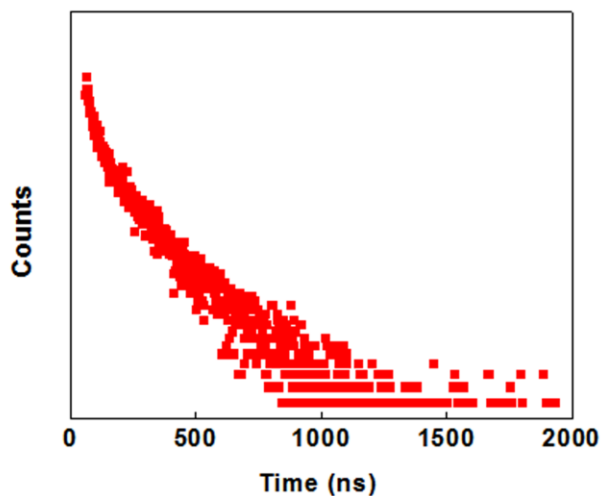


Figure S7. PL life time of CISe-1/4 at emission of 620 nm

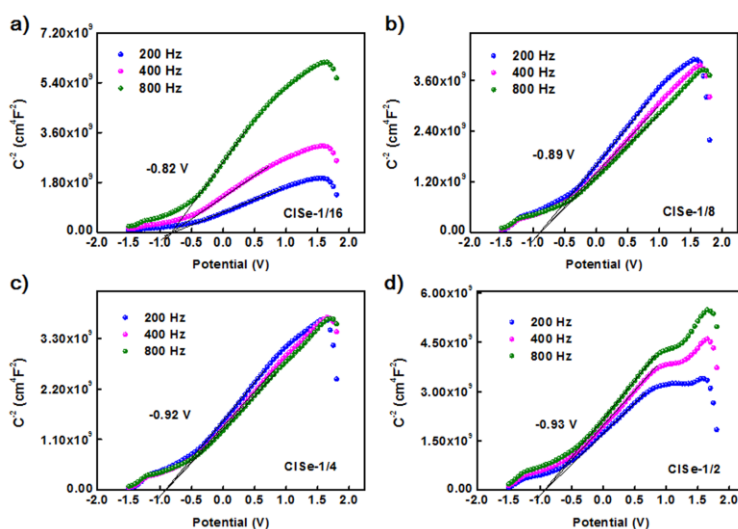


Figure S8. E_{it} of CISe QDs with various Cu/In ratios (VS Ag/Ag^+): CISe-1/16 at (a), CISe-1/8 at (b), CISe-1/4 at (c), CISe-1/2 at (d).

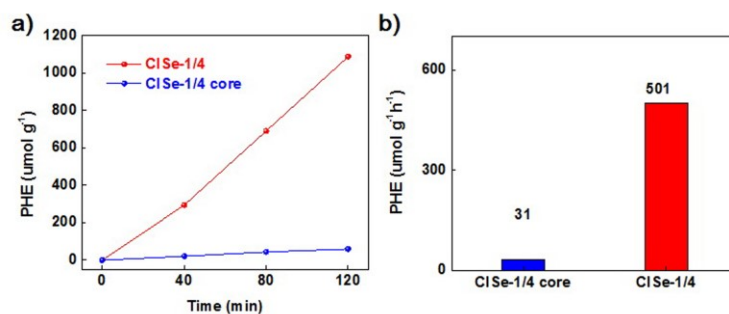


Figure S9. The PHE of CISe-1/4 nucleus and the coarsened sample (at 180 ° C for 60 hours)

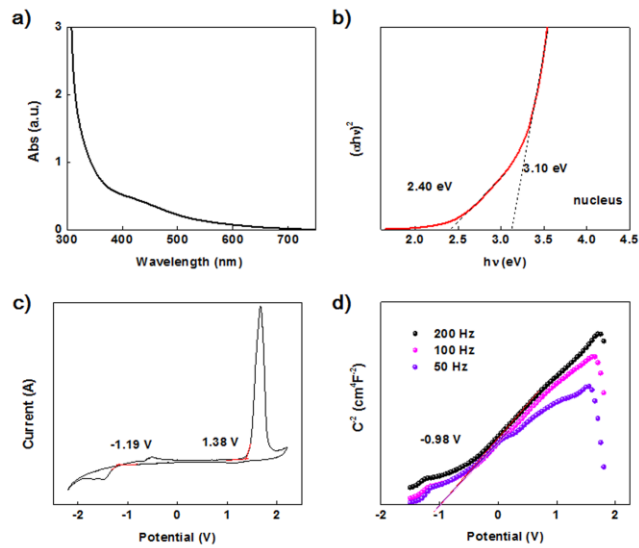


Figure S10. CISE-1/4 nucleus of UV-absorption spectra at (a), band gap evaluated from Tauc plots at (b), cyclic voltammetry curves of E^{OX} and E^{RED} at (c), the flat band potential at (d)

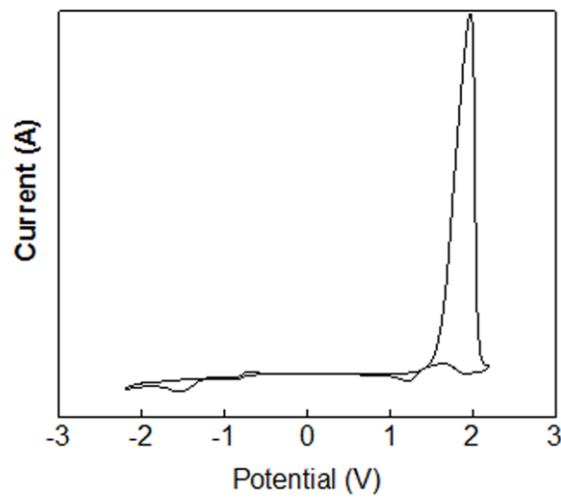


Figure S11. Cyclic voltammetry curves of bare glassy carbon electrode

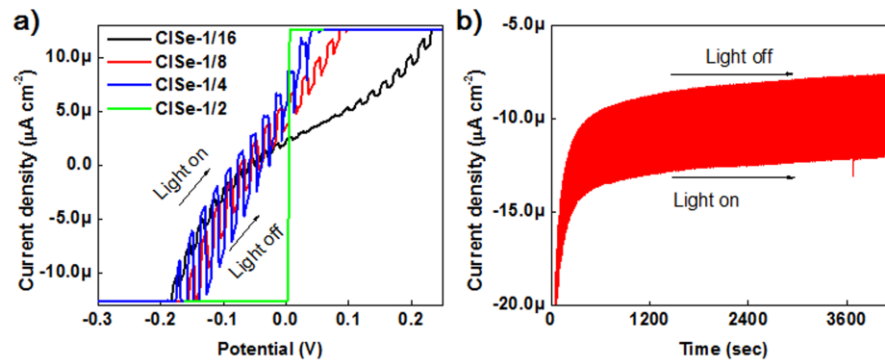


Figure S12. a) The linear sweep voltammetric (LSV) curves of CISE-1/2, CISE-1/4, CISE-1/8 and CISE-1/16, b) the stability of photoelectrochemical activity of CISE-1/4