Supplementary Information

Controlled Growth of Lead-Free Cesium Zirconium Halide Double Perovskite Nanocrystals through Microfluidic Reactor

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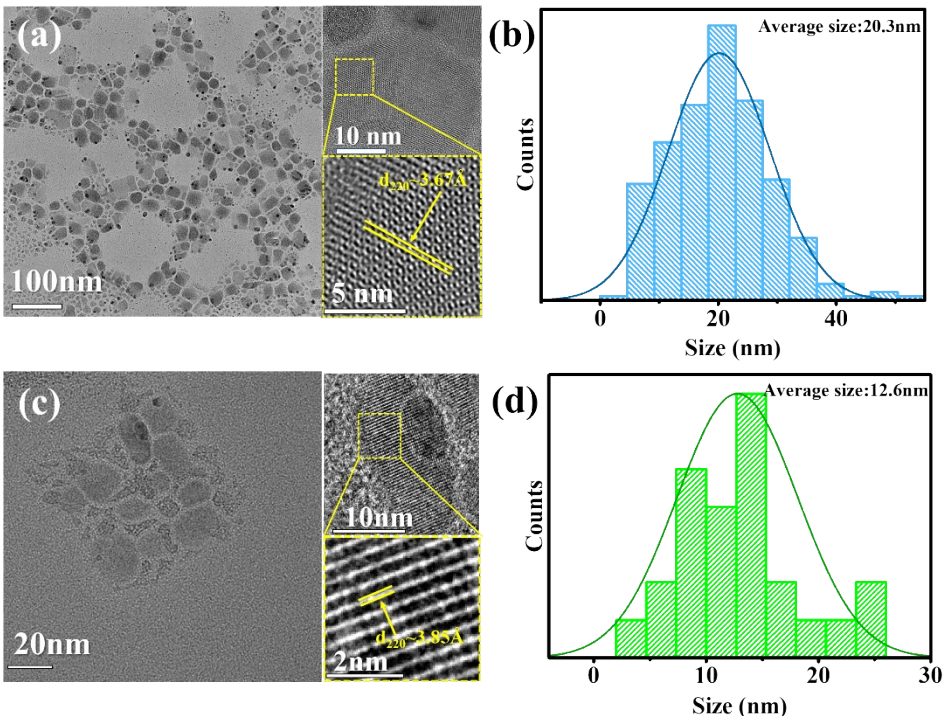

Figure S1 (a) TEM image and (b) size distribution histogram of Cs_2ZrCl_6 NCs; (c) TEM image and (d) size distribution histogram of Cs_2ZrBr_6 NCs.

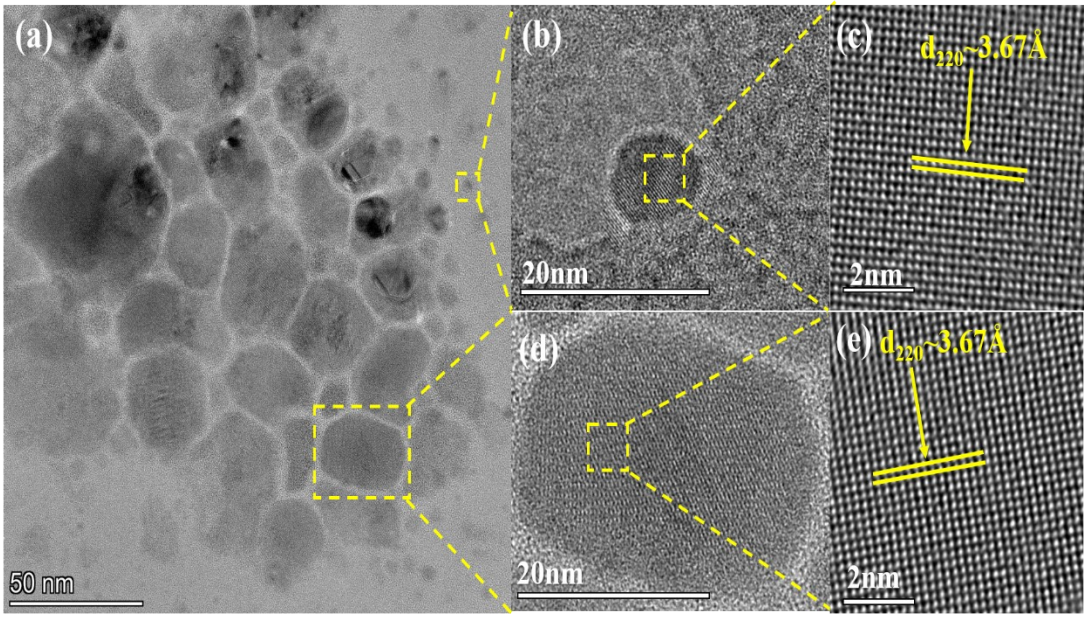

Figure S2 (a) TEM image of Cs_2ZrCl_6 NCs. HR-TEM image of (b, c) single small Cs_2ZrCl_6 particle, and (d, e) single large Cs_2ZrCl_6 nanosheet.

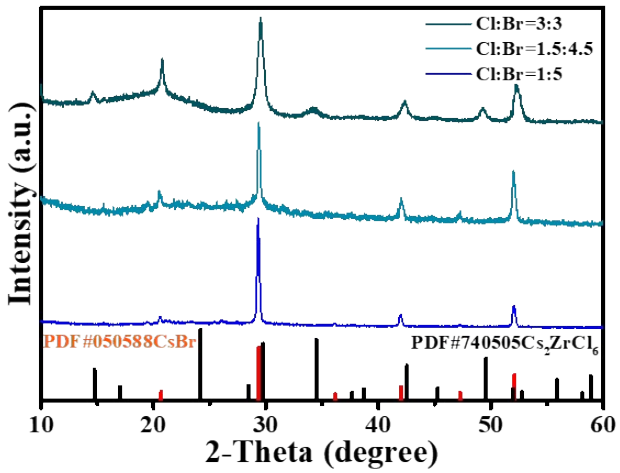

Figure S3 XRD patterns of the NCs synthesized with TMSCl/TMSBr precursor ratios of 3:3,1:5 and 1.5:4.5, respectively.

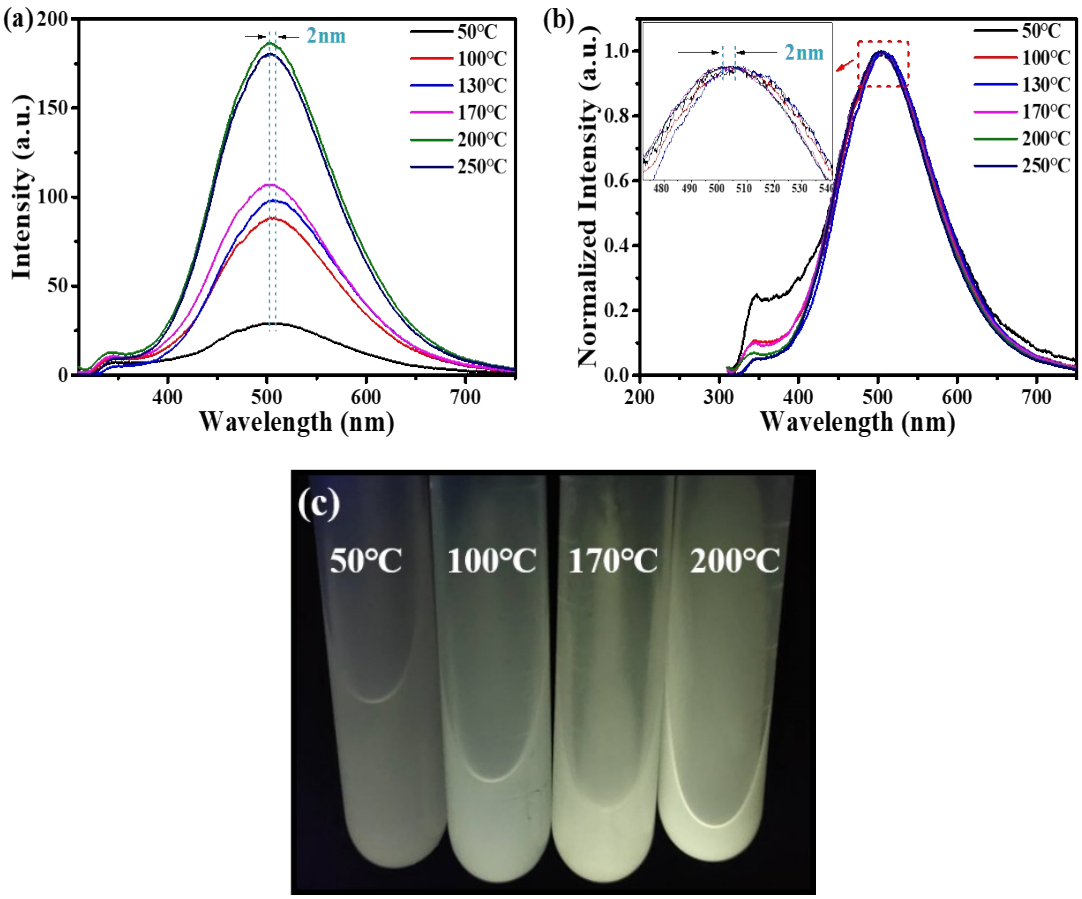

Figure S4 (a) Relative PL and (b) normalized PL spectra of the Cs_2ZrBr_6 NCs synthesized at 50 °C, 100 °C, 130 °C, 170 °C, 200 °C and 250 °C reaction temperatures; (c) Photographs of the samples under UV light excitation.

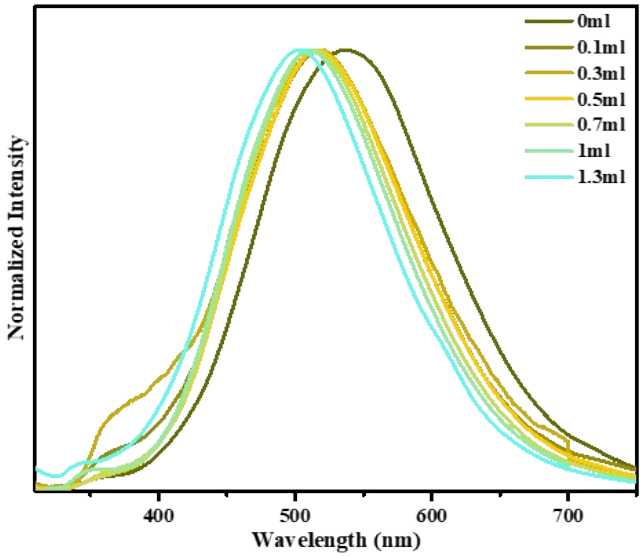

Figure S5 PL spectra of Cs_2ZrBr_6 NCs prepared with different amount of OAm.

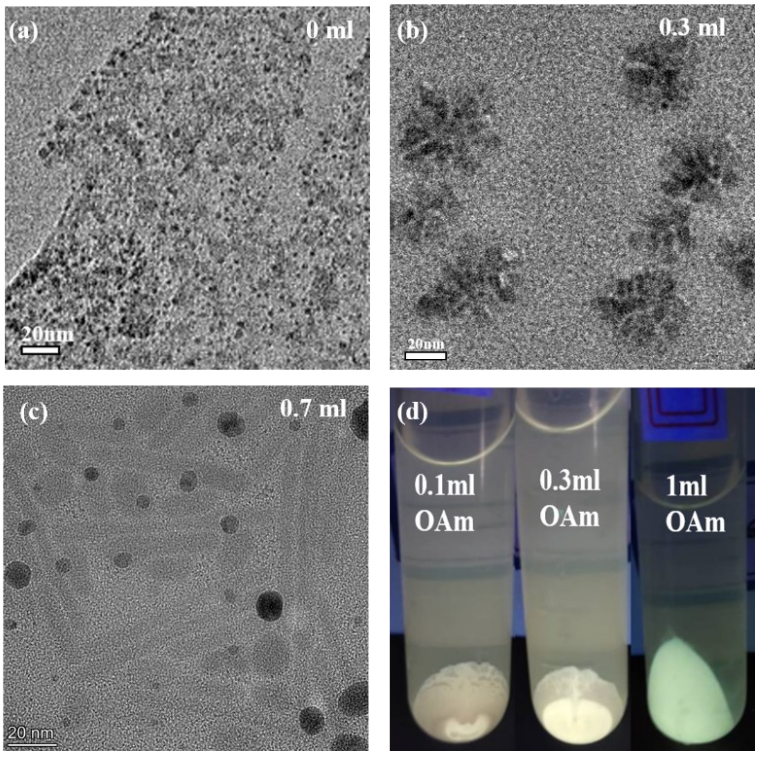

Figure S6 TEM patterns of Cs_2ZrBr_6 NCs prepared at (a) 0 ml, (b) 0.3 ml, and (c) 0.7 ml OAm; (d) Photographs of the prepared samples with different amount of OAm after centrifugation.

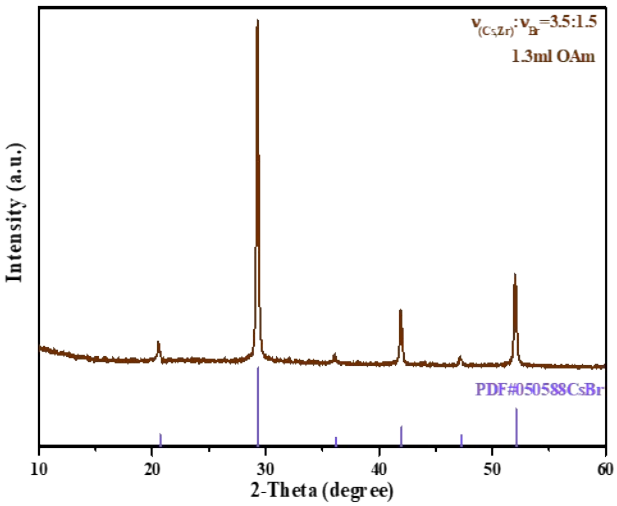

Figure S7 XRD pattern of the samples prepared at a precursor flow rate ratio of 3.5:1.5 and 1.3 ml of OAm.

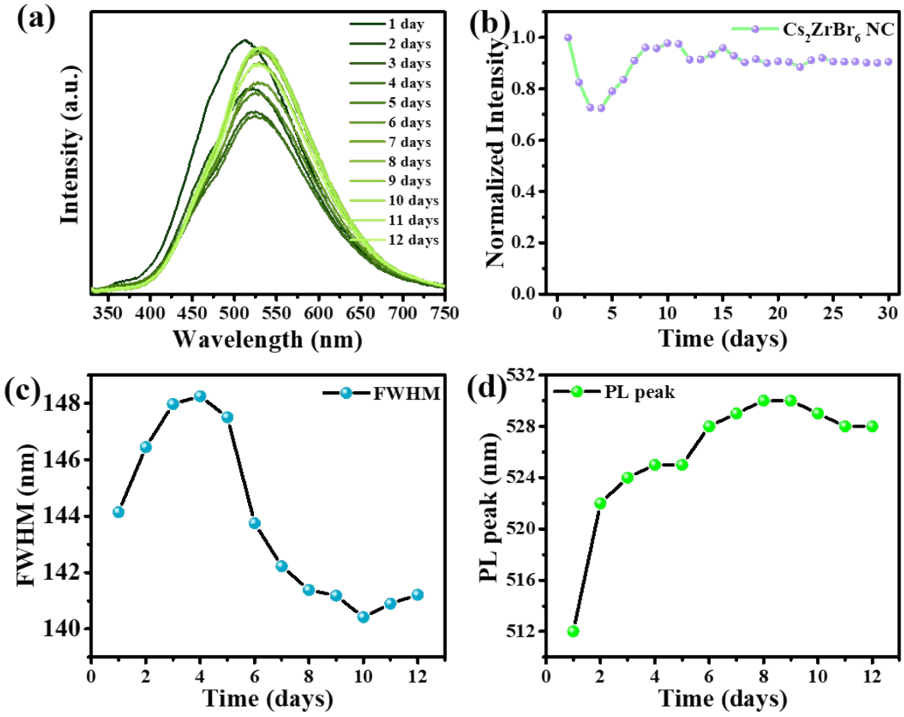

Figure S8 (a) Relative PL spectra of the prepared Cs_2ZrBr_6 NCs upon long-time exposure in air, (b) temporal evolution of the relative integrated PL intensity, (c) PL peak wavelength, and (d) FWHM of the Cs_2ZrBr_6 NCs.

Table S1 Structural parameters of Cs_2ZrBr_6.

Material	Space group	a=b=c(Å)	V/Å^3
Cs_2ZrBr_6	$Fm\bar{3}m$	10.90	1295.029

Atom	Wyckoff position	x	y	z	Occ.
Cs	8c	0.25	0.25	0.25	1
Zr	4a	0	0	0	1
Br	24e	0.23564	0	0	1