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

Supporting Information

Highly Efficient Blue Emitting One Dimensional Lead-Free Nanocrystals

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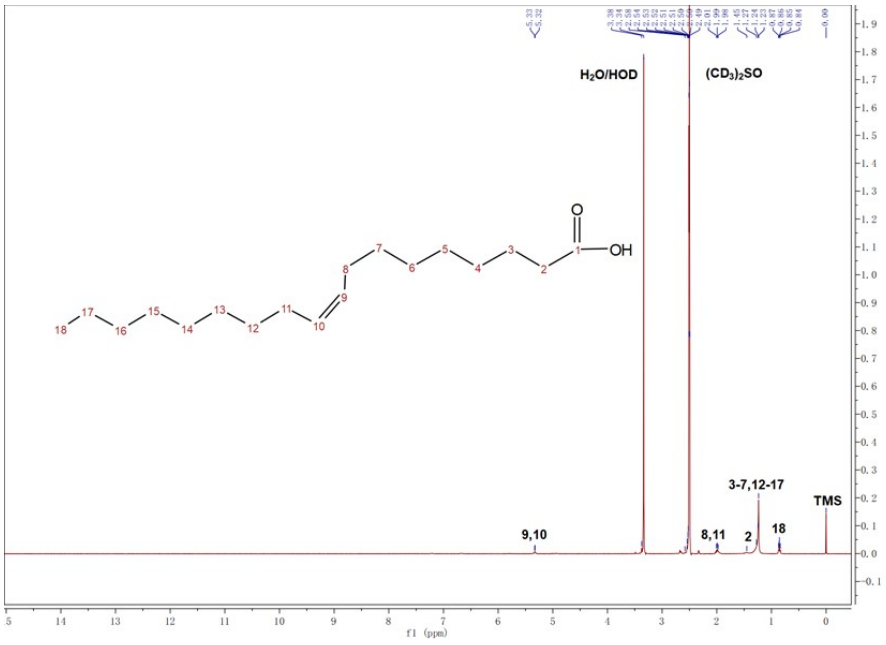


Figure S1. ^{1}H NMR spectra of $Cs_5Cu_3Cl_6I_2$ NCs dissolved in $(CD_3)_2SO$.

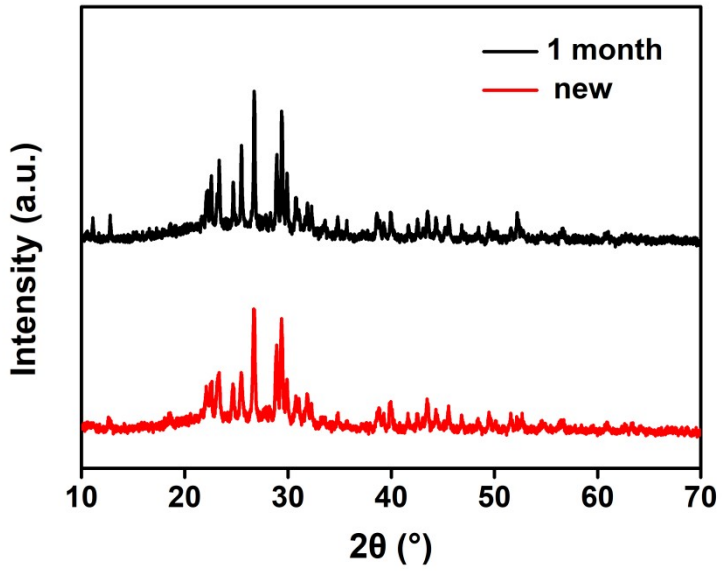


Figure S2. XRD patterns of $Cs_5Cu_3Cl_6I_2$ powders stored in the air for 0 day and 1 month.

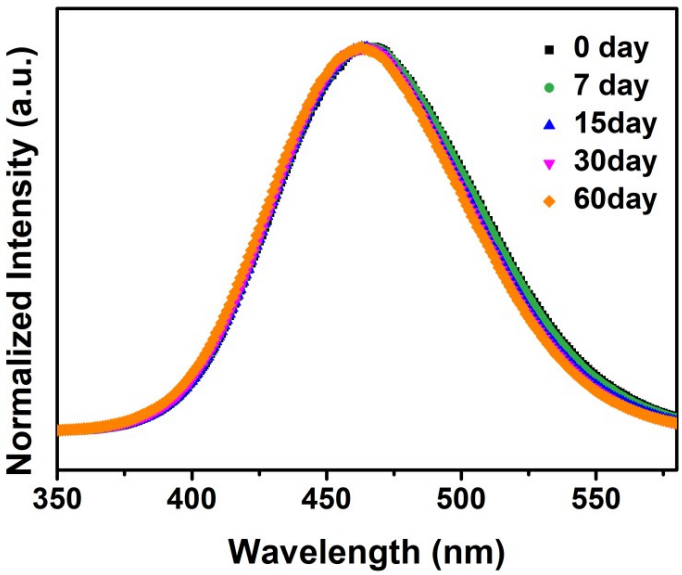


Figure S3. PL spectra of $Cs_5Cu_3Cl_6I_2$ colloidal NCs stored in ambient condition for different time.

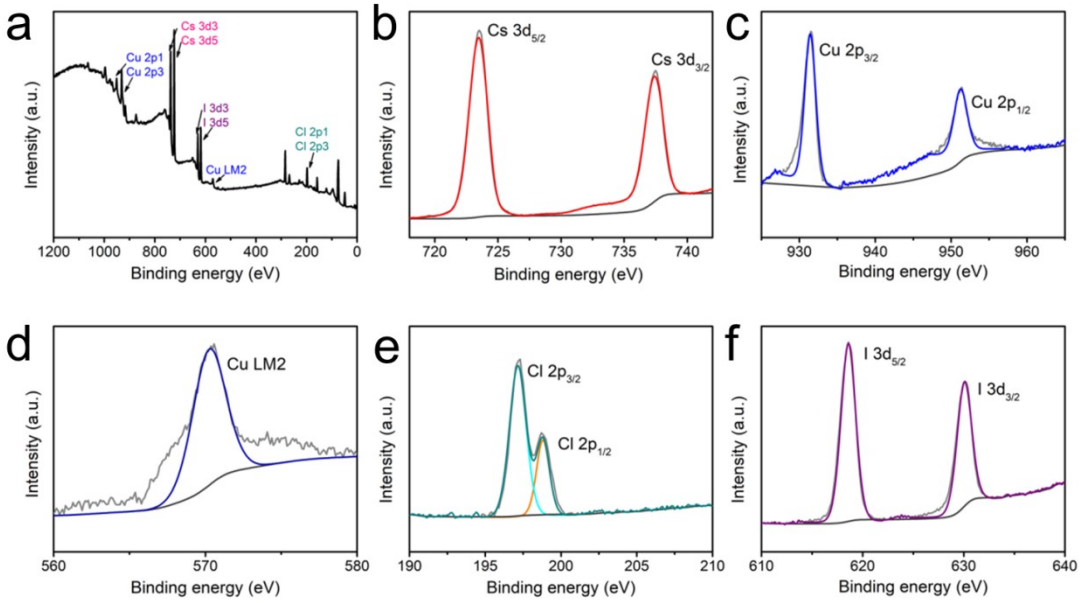


Figure S4. (a) X-ray photoelectron spectroscopic (XPS) analysis of $Cs_5Cu_3Cl_6I_2$ NCs powders and the high-resolution spectra of (b) Cs 3d; (c) Cu 2p; (d) Cu LM2; (e) Cl 2p; (f) I 3d.

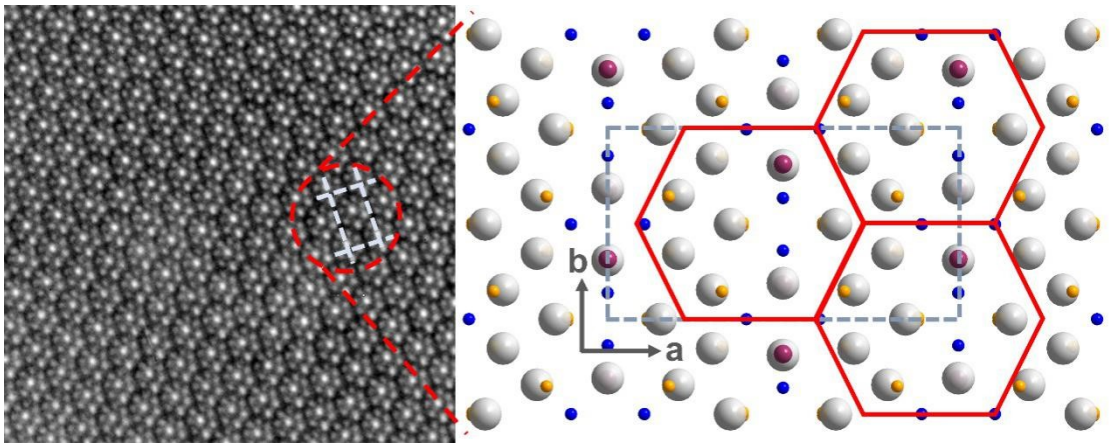


Figure S5. The transmission electron microscopy image of $Cs_5Cu_3Cl_6I_2$ NCs (right: projected view of (001) lattice planes; Gray, blue, yellow and purple spheres represent Cs, Cu, Cl and I atoms, respectively).

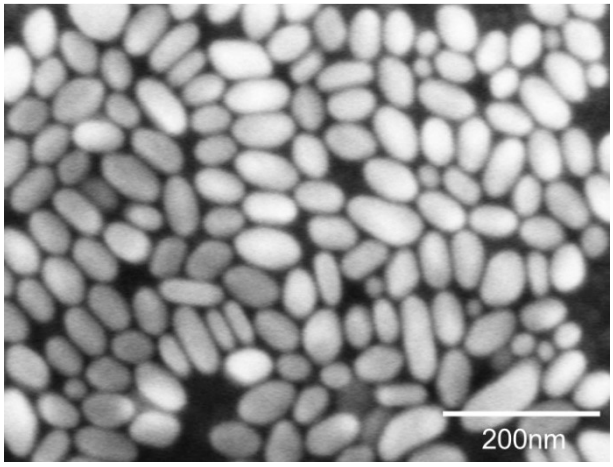


Figure S6. The scanning electron microscopy image of $Cs_5Cu_3Cl_6I_2$ NCs coated on ITO substrate.

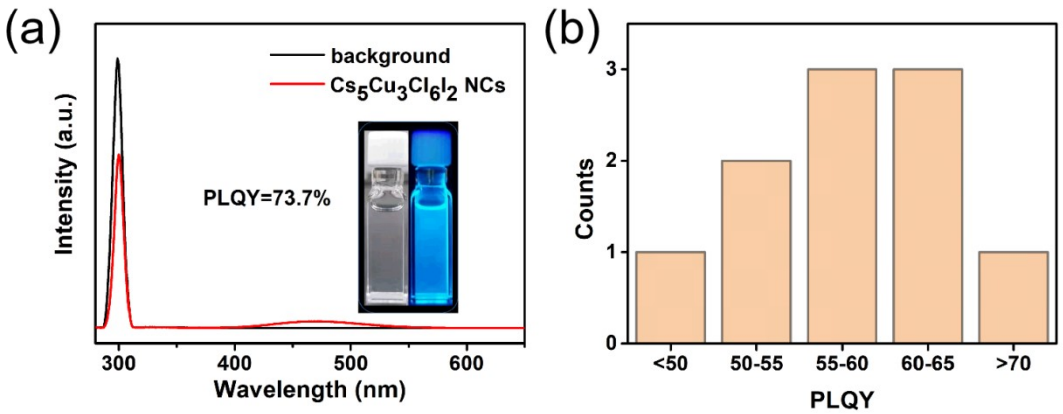


Figure S7. (a) PLQY and corresponding sample with and without excitation by UV light of $Cs_5Cu_3Cl_6I_2$ NCs. (b) The value of PLQY distribution histogram of as-prepared samples.

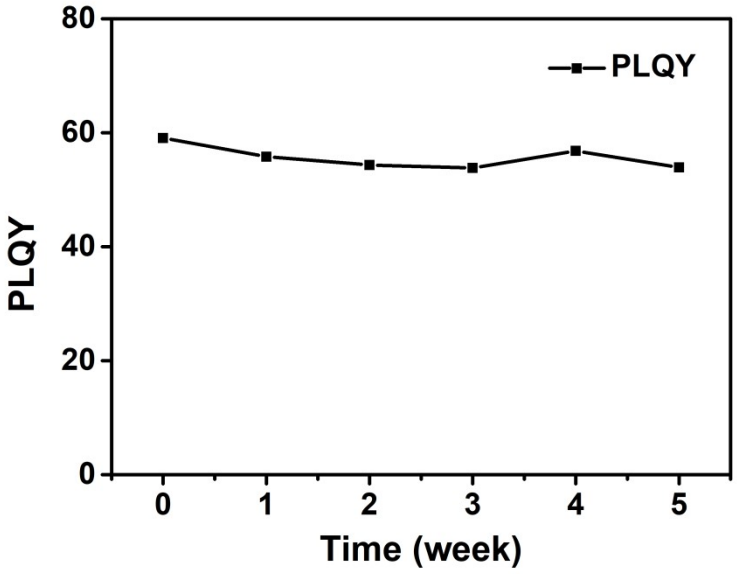


Figure S8. Plot of PLQYs over time for $Cs_5Cu_3Cl_6I_2$ NCs.

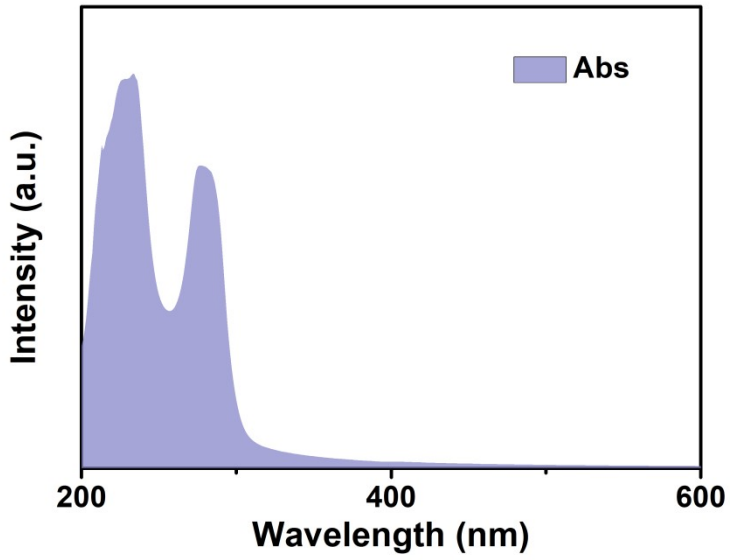


Figure S9. The UV/Vis absorption spectra of $Cs_5Cu_3Cl_6I_2$ NCs.

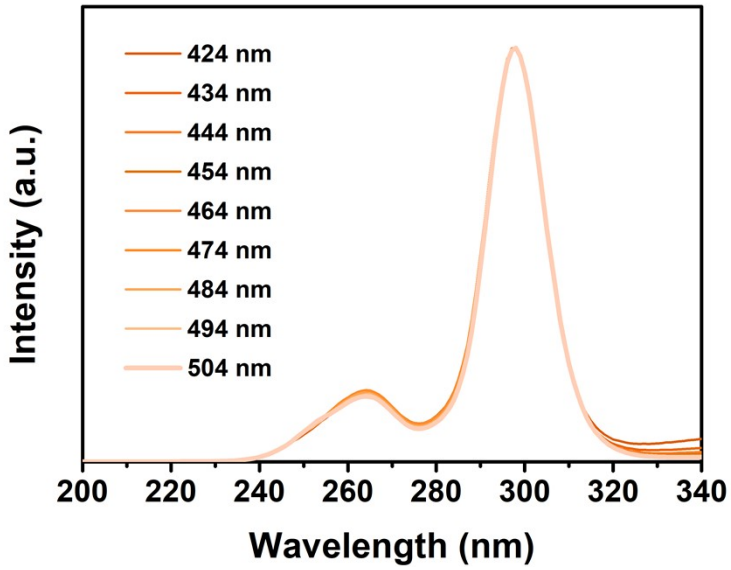


Figure S10. PL excitation (PLE) spectra measured at different emission wavelength.

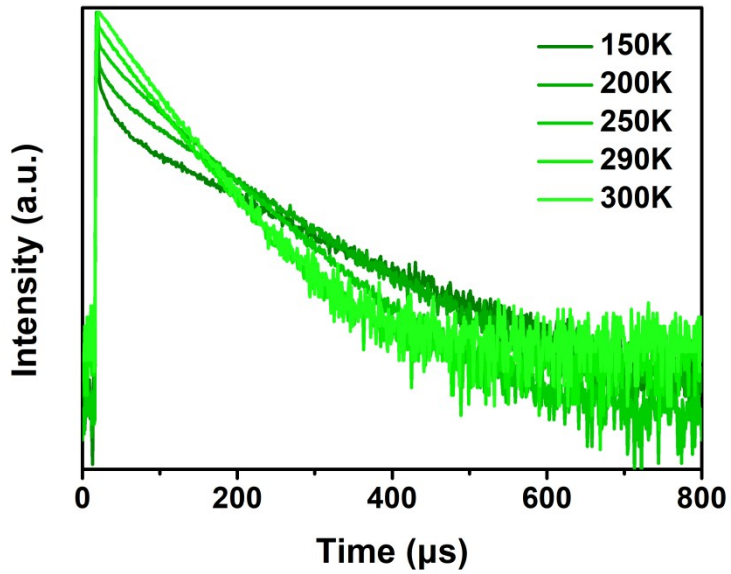


Figure S11. Time-resolved PL decay curves of $Cs_5Cu_3Cl_6I_2$ NCs.

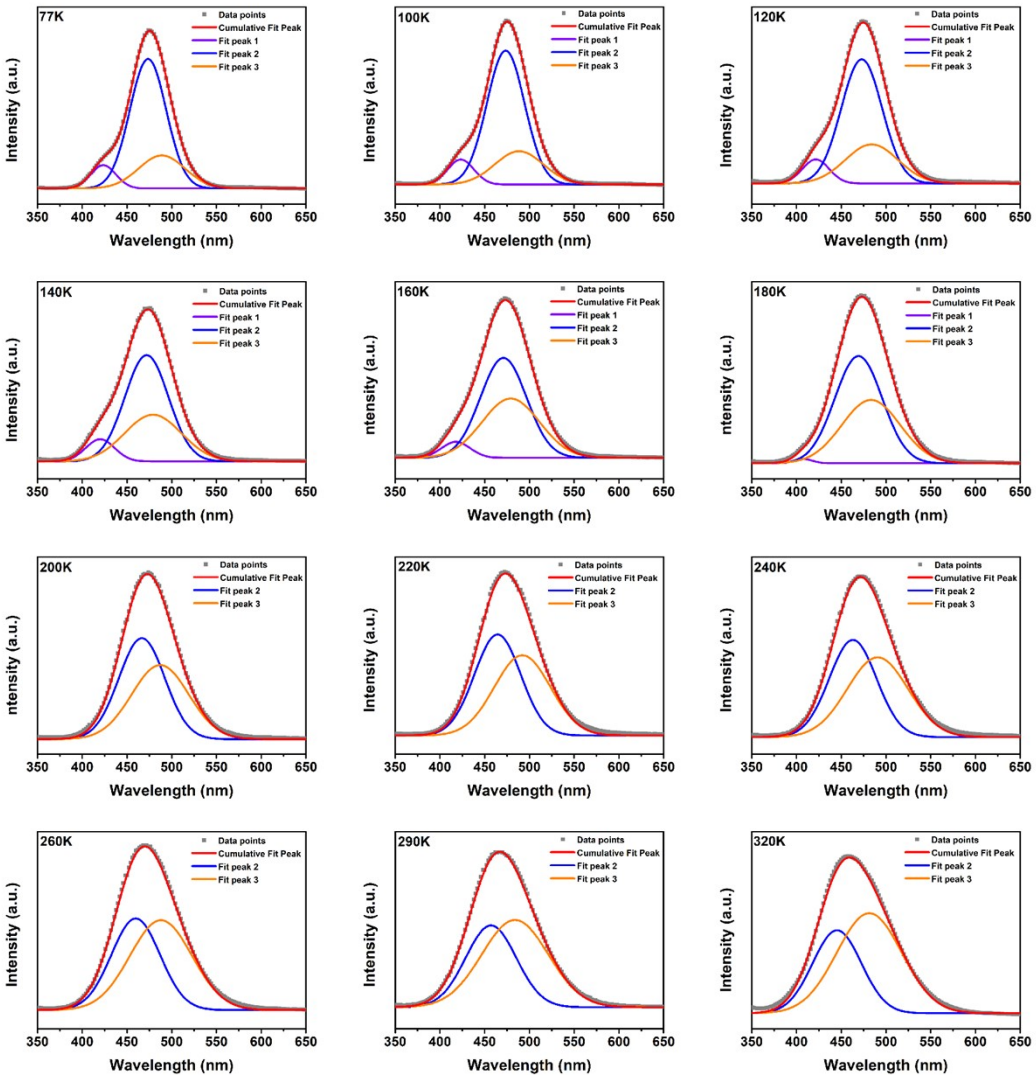


Figure S12. The fitted PL spectra by an exponentially modified Gaussian by multiple Gaussian distributions at different temperature.

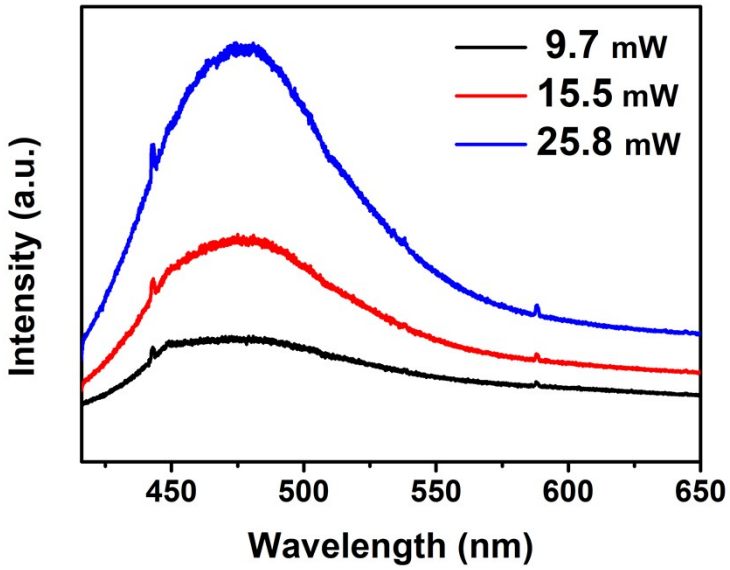
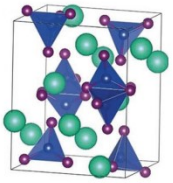
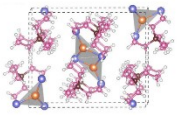
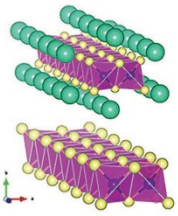
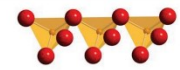
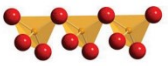
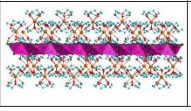


Figure S13. The PL spectra of $Cs_5Cu_3Cl_6I_2$ NCs at different power density.

Table S1. Structural and optical characteristics of copper halide perovskites-like materials.

Compound	Dimension	PL/ nm	Stokes shift/ nm	Polyhedral connection mode	Structure	Reference
$Cs_3Cu_2I_5$	0D	445	155	edge-sharing		1
$(MA)_4Cu_2Br_6$		524	222			2
$(C_{16}H_{36}N)CuI_2$		463	183			3
$CsCu_2I_3$	1D	568	240	edge-sharing		4
Rb_2CuCl_3		395	93	corner-sharing		5
Rb_2CuBr_3		385	85	corner-sharing		5
$[KC_2]_2[Cu_4I_6]$		545	145	edge-sharing and face-sharing		6

References

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