Supporting Information

Dual-Color Photoluminescence Modulation of Zero-Dimensional Hybrid Copper Halide Microcrystals

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Table S1 Single crystal X-ray diffraction (SCXRD) data and structure refinement for Bmpip(Cu_2Br_4).

Formula	$C_{20}H_{44}N_2Cu_2Br_4$ [$(Bmpip)_2Cu_2Br_4$]
Formula weight	759.28
Temperature (K)	293
Radiation, wavelength (Å)	Mo Kα, 0.71073
Crystal system	Orthorhombic
Space group, Z, Z'	P_{bca} (68), 8, 1
α/°, β/°, γ/°	90, 90, 90
Unit cell parameters	a = 13.8255 (Å) b = 12.0429 (Å) c = 17.0850 (Å)
Volume/Å^3	2844.64
Density (g/cm^3)	1.773
2θ range for the data collection/°	2.384-30.723
Reflections collected	20287
Independent reflections	3713
Restraints/parameters	0/129
Goodness-of-fit on F^2	1.040
Final R indexes [1< 2σ (I)]	R_1 = 0.0432, wR_2 = 0.0716
Final R indexes [all data]	R_1 = 0.0824, wR_2 = 0.0803

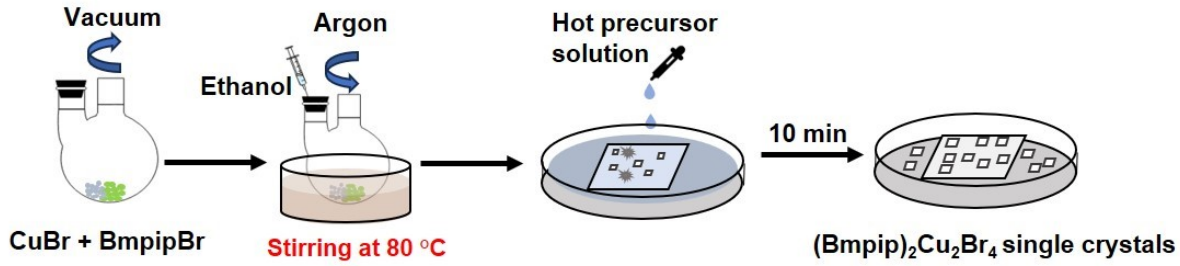


Fig. S1 $(Bmpip)_2Cu_2Br_4$ microcrystal (MC) preparation method.

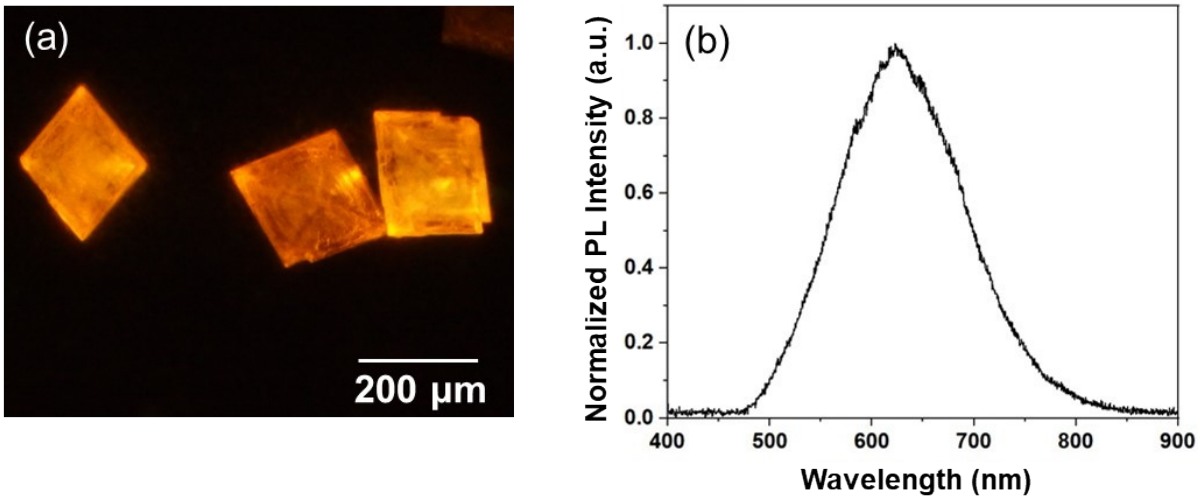


Fig. S2 (a) A photoluminescence (PL) image and (b) a PL spectrum of $(Bmpip)_2Cu_2Br_4$ MCs showing an intense red emission with a faint yellow emission (λ_{ex} = 404 nm).

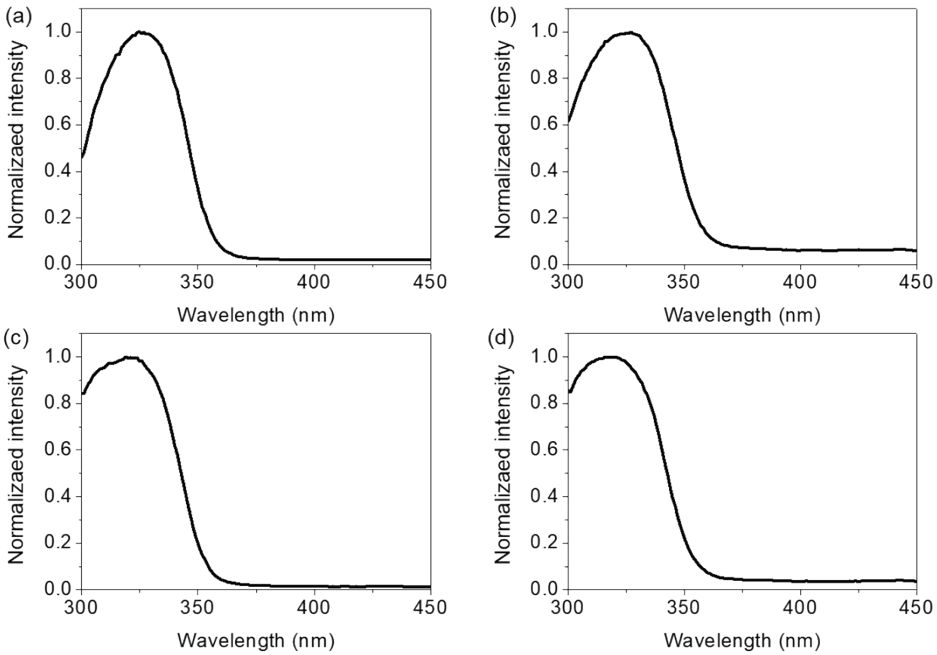


Fig. S3 PLE spectra (a,c: 600 nm; b,d, 540 nm) of (a,b) the $(Bmpip)_2Cu_2Br_4$ MCs prepared on a borosilicate glass plate and (c,d) an ITO-coated glass plate.

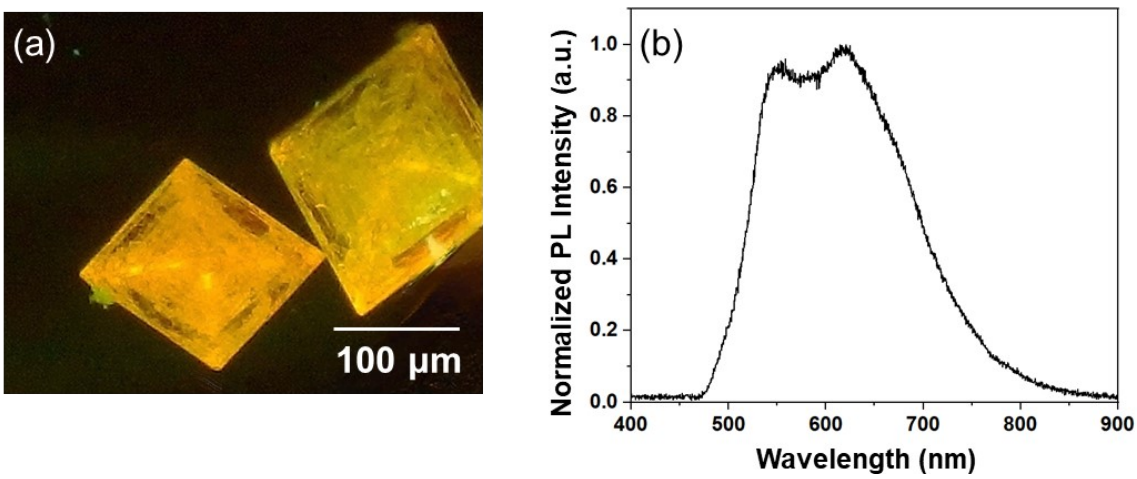


Fig. S4 (a) A PL image and (b) a PL spectrum of $(Bmpip)_2Cu_2Br_4$ MCs prepared with small amount (10 μL) of water (λ_{ex} = 404 nm).

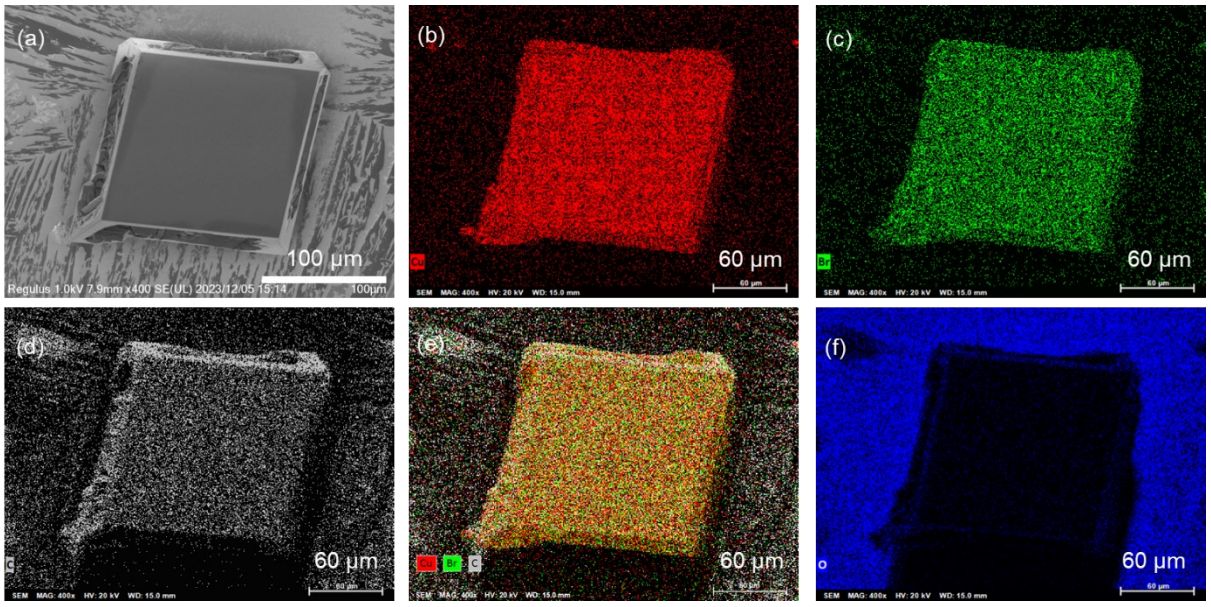


Fig. S5 (a) An SEM image, (b-f) EDX elemental maps of (b) copper, (c) bromide, (d) carbon, (e) an overlaid image of copper, bromide, and carbon, (f) oxygen of the MC prepared on a borosilicate glass plate.

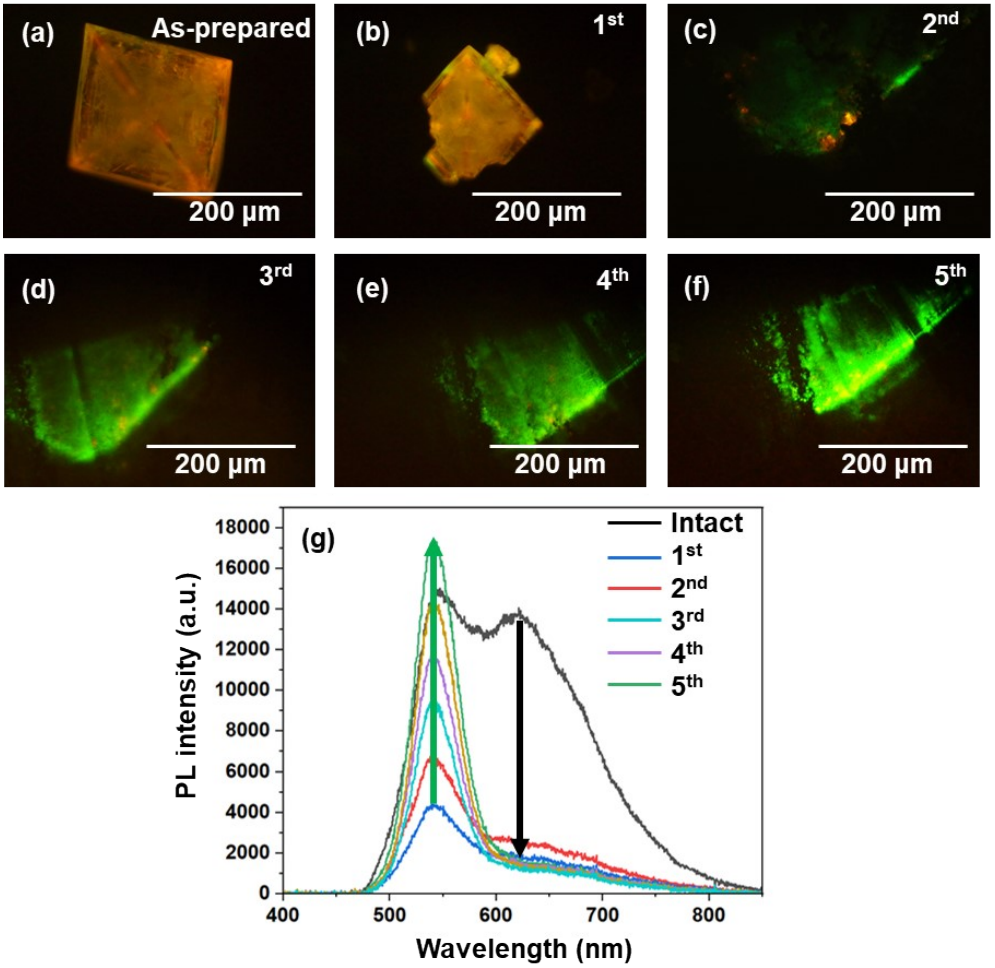


Fig. S6 (a-f) PL images and (g) PL spectral changes of the $(Bmpip)_2Cu_2Br_4$ MCs prepared on a borosilicate glass plate during five times cracking and powdering using a stainless-steel spatula (λ_{ex} = 404 nm).

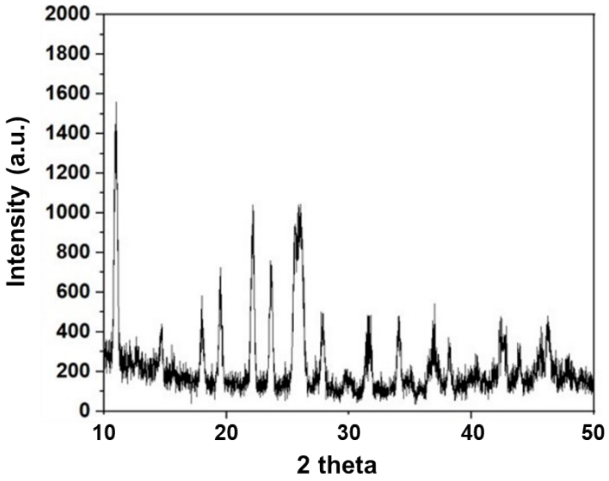
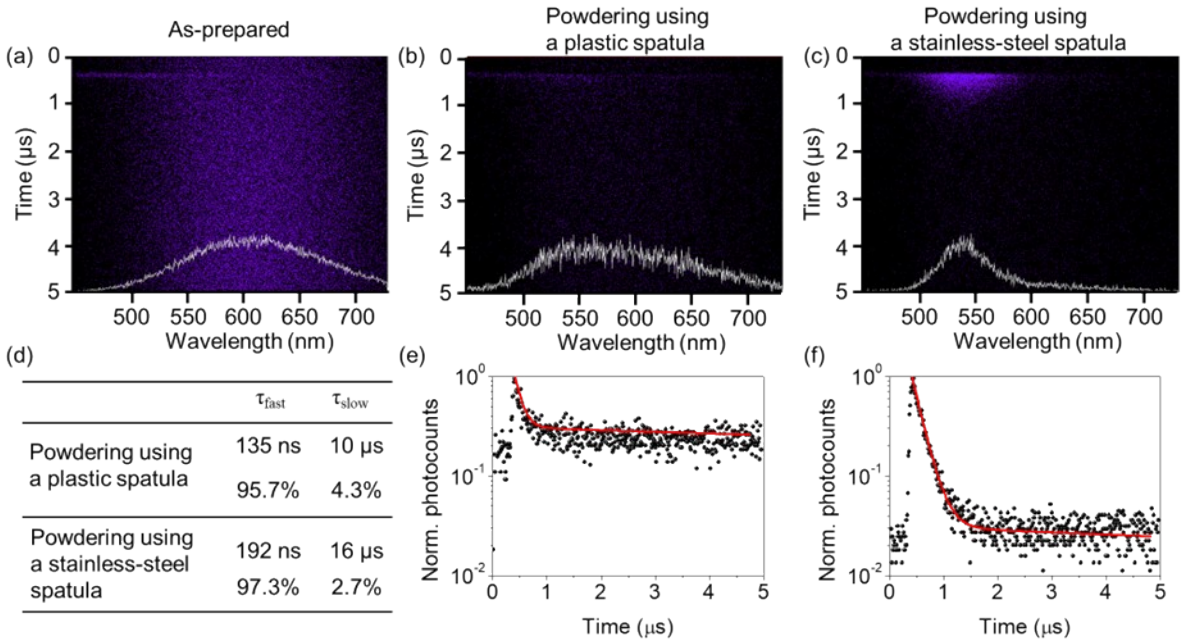


Fig. S7 A powder-XRD pattern of $(Bmpip)_2Cu_2Br_4$ MCs prepared on a borosilicate glass plate after powdering it using a stainless-steel spatula.



	τ_{fast}	τ_{slow}
Powdering using a plastic spatula	135 ns 95.7%	10 μs 4.3%
Powdering using a stainless-steel spatula	192 ns 97.3%	16 μs 2.7%

Fig. S8 Photocount map of the $(Bmpip)_2Cu_2Br_4$ MCs prepared on a borosilicate glass plate (a) before and (b,c) after powdering using (b) a plastic spatula and (c) a stainless-steel spatula (λ_{ex} = 405 nm). The dense purple dots indicate detected photons from the sample. a, b and c are corresponding to Fig. 4b, 4d and 4e, respectively. The short decay below 500 nm in a is scattering and fluorescence from the glass substrate. The white lines in the photocount maps indicate the normalized PL spectra. (d) PL lifetime components of the decay curves in e and f. (e,f) PL decay curves of the MCs after powdering using (e) a plastic spatula and (f) a stainless-steel spatula. The red lines in e and f indicate biexponential fitting curves.