

Electronic Supporting Information

Water-Assisted Synthesis of Lead Free Cu Based Fluorescent Halide Perovskite Nanostructures†

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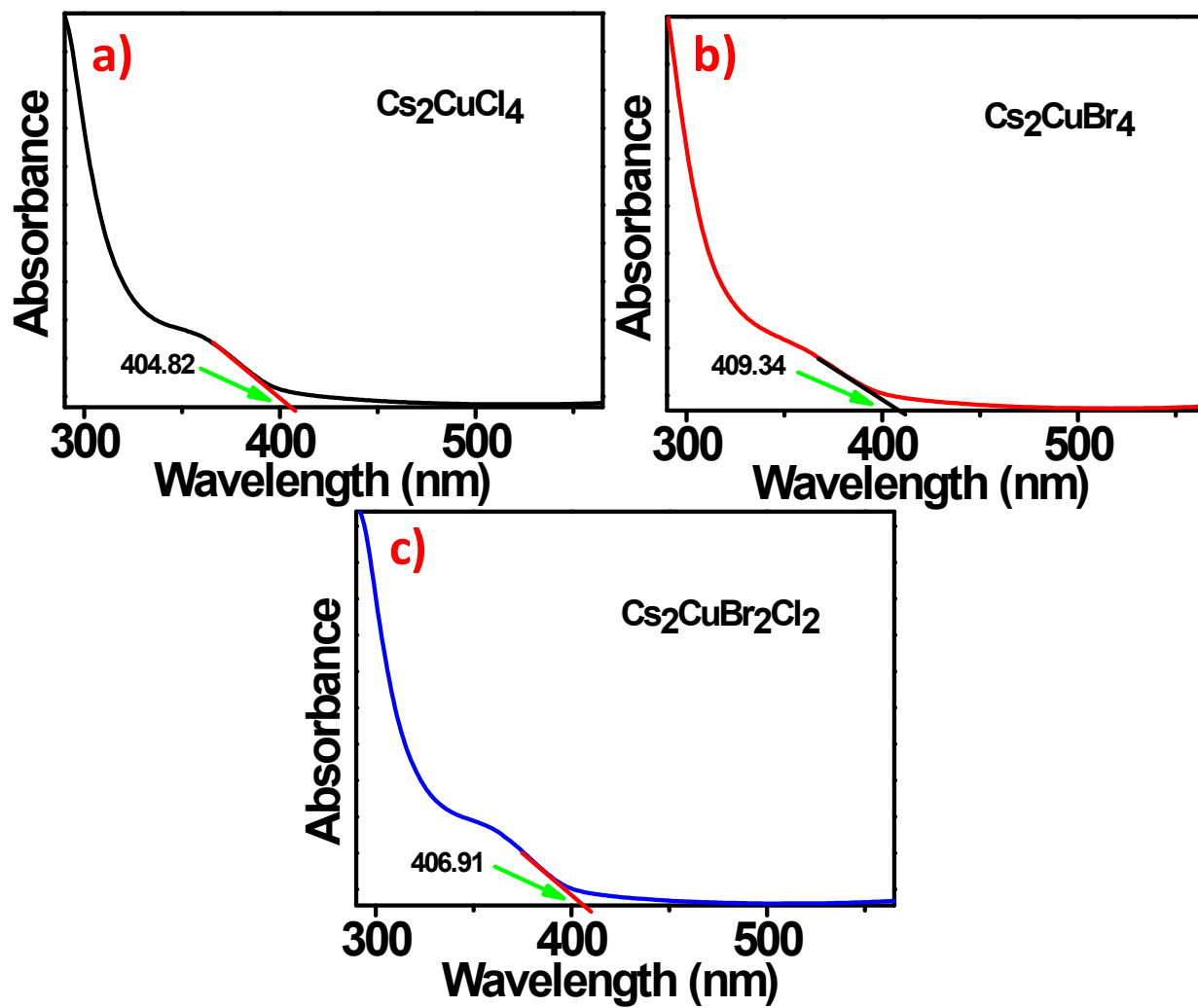


Fig. S1 a)-c) UV-visible spectra showing the band-gaps of Cs_2CuCl_4 , Cs_2CuBr_4 and $\text{Cs}_2\text{CuBr}_2\text{Cl}_2$, respectively.

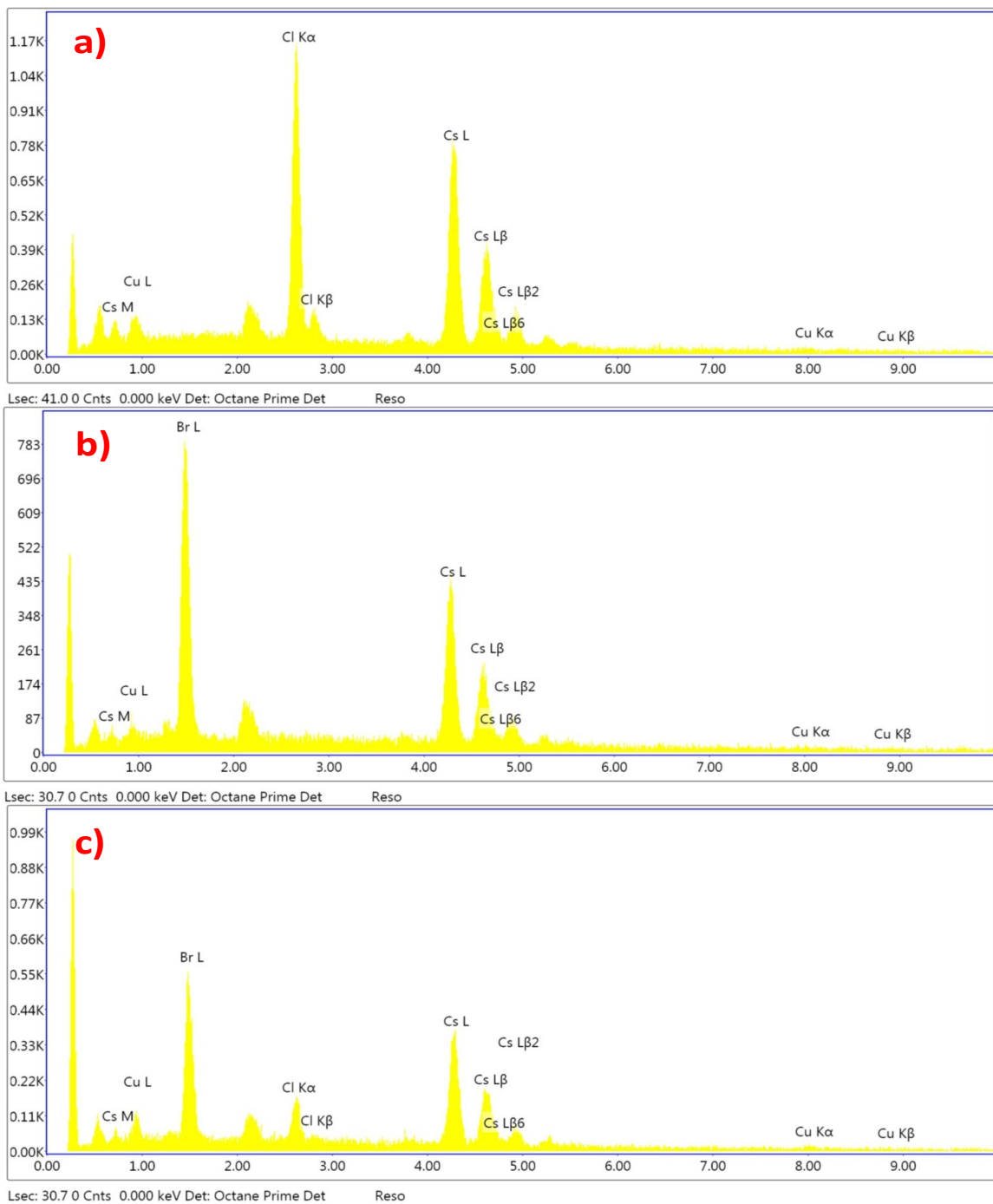


Fig. S2 a)-c) EDS studies representing the elements of Cs_2CuCl_4 square nanoplates, Cs_2CuBr_4 nanorods and $\text{Cs}_2\text{CuBr}_2\text{Cl}_2$ reactenguler shaped nanoplates, respectively.

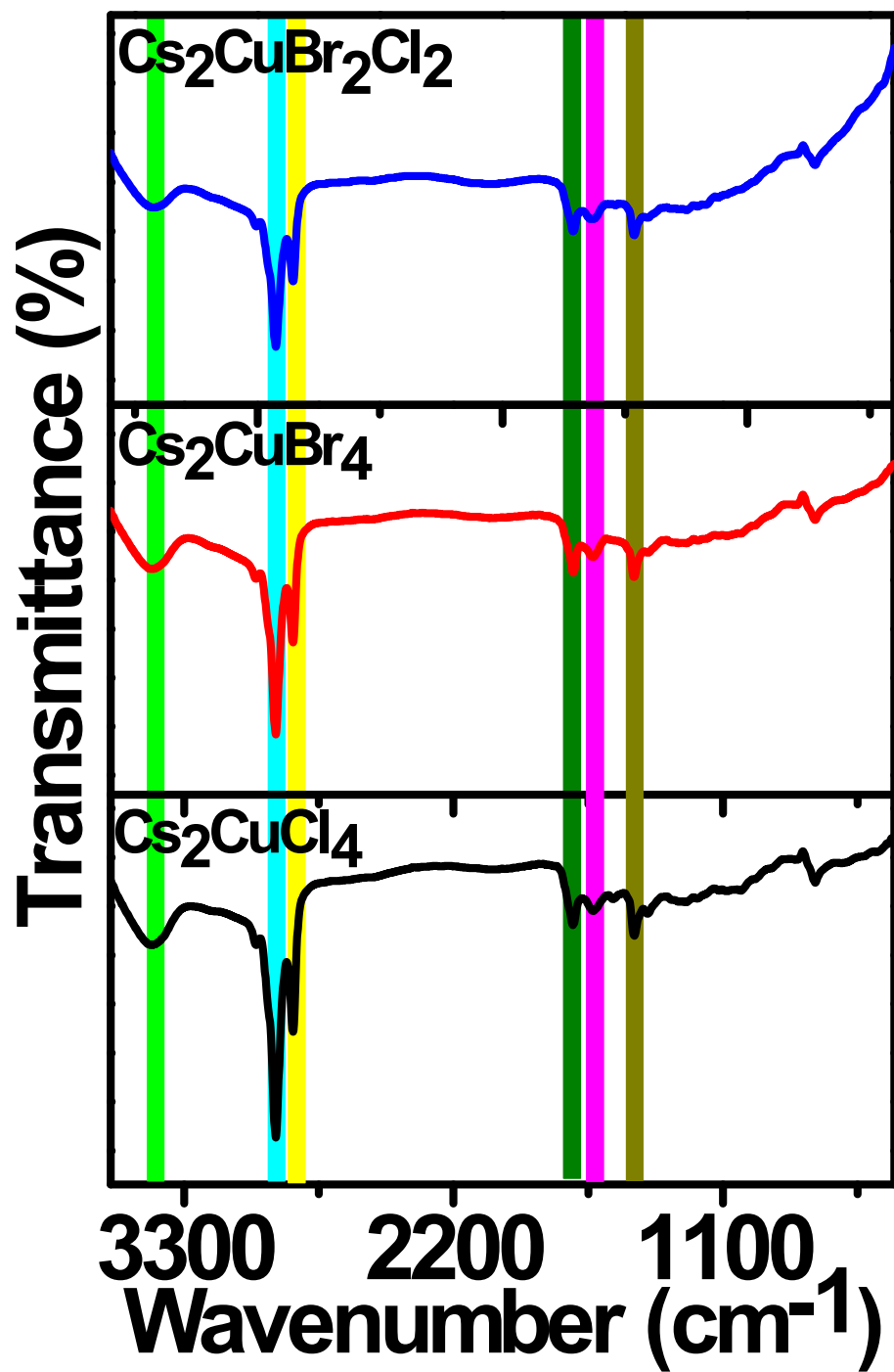


Fig. S3 FTIR spectral studies of Cs_2CuCl_4 , Cs_2CuBr_4 and $\text{Cs}_2\text{CuBr}_2\text{Cl}_2$ perovskites.

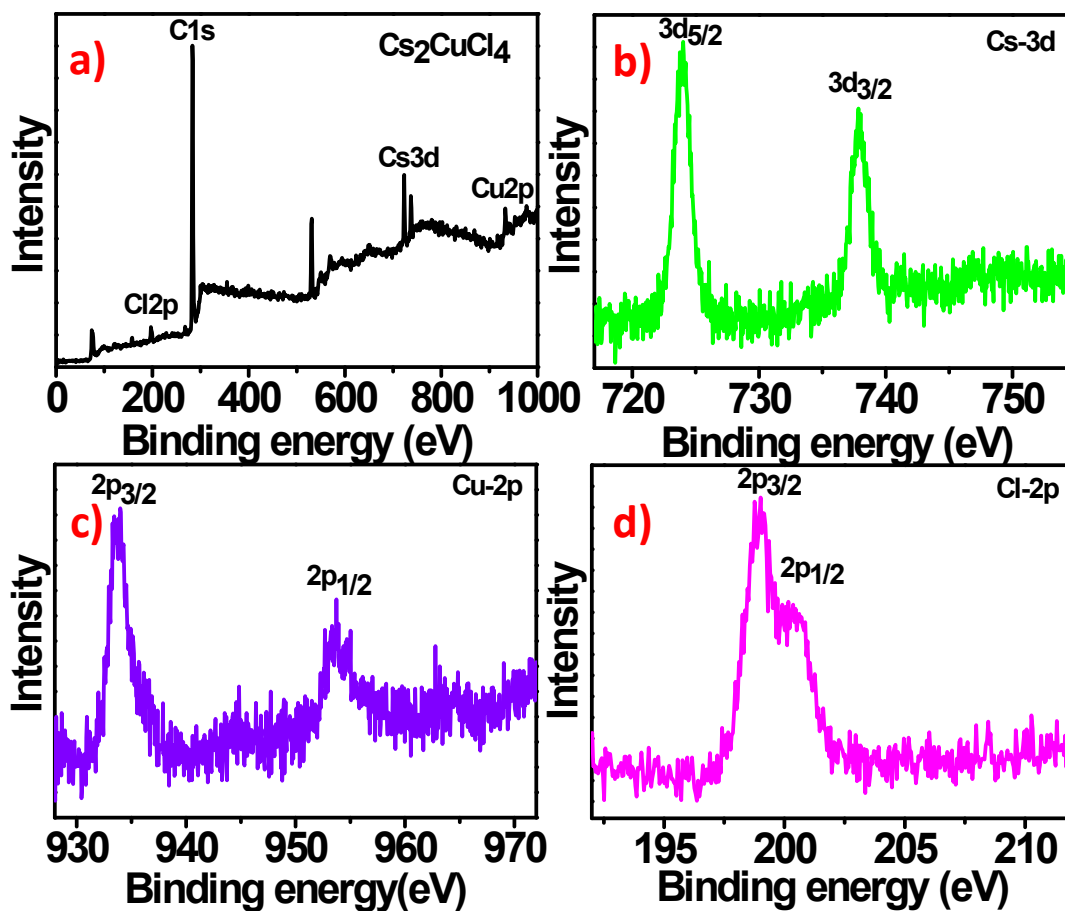


Fig. S4 a) XPS survey scan of Cs_2CuCl_4 b) Narrow scan of Cs 3d c) Narrow scan of Cu 2p d) Narrow scan of Cl 2p.

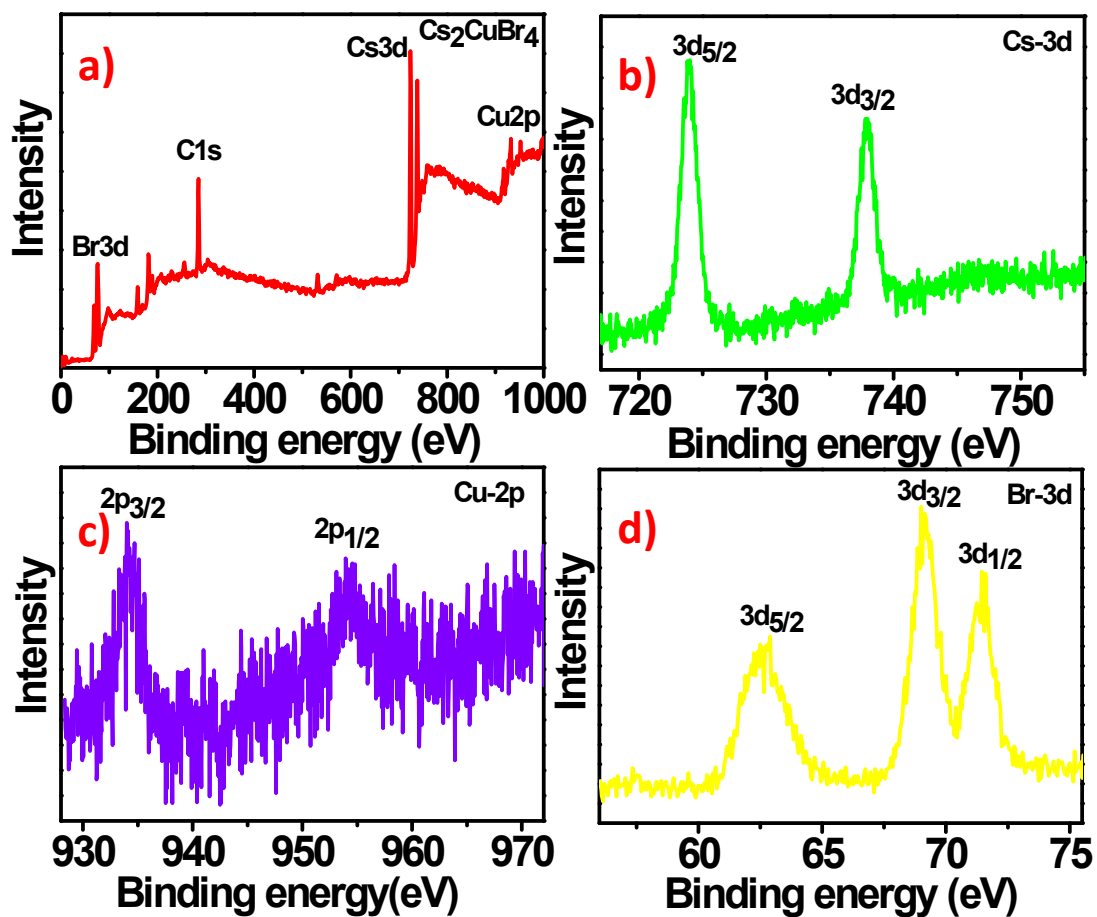


Fig. S5 a) XPS survey scan of Cs_2CuBr_4 b) Narrow scan of Cs 3d c) Narrow scan of Cu 2p d) Narrow scan of Br 3d.

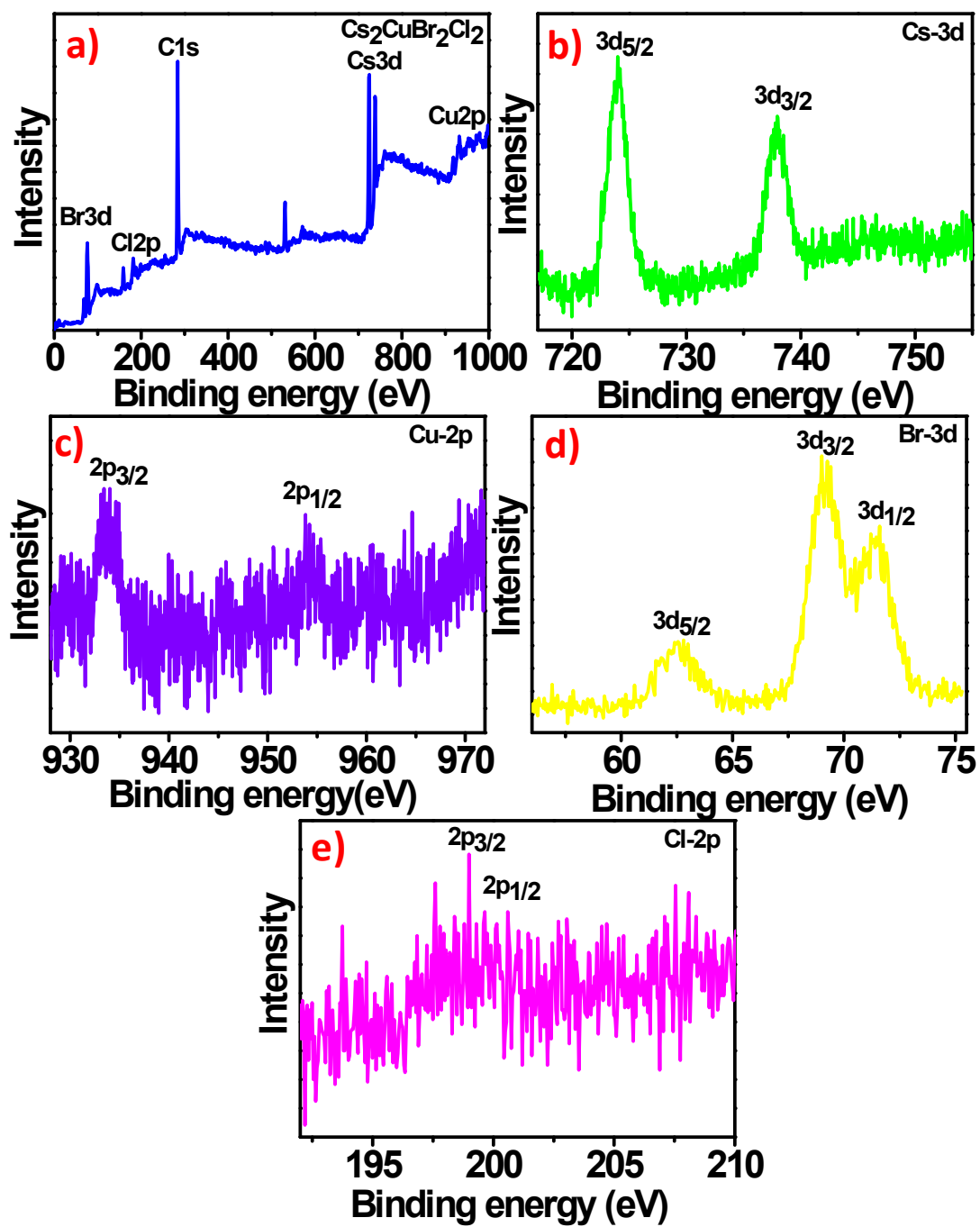


Fig. S6 a) XPS survey scan of $\text{Cs}_2\text{CuBr}_2\text{Cl}_2$ b) Narrow scan of Cs 3d c) Narrow scan of Cu 2p d) Narrow scan of Br 3d e) Narrow scan of Cl 2p.

TCSPC studies:

The average lifetime of all the samples was calculated by using the formula:

$$\tau_{avg} = \frac{A_1\tau_1^2 + A_2\tau_2^2 + A_3\tau_3^2}{A_1\tau_1 + A_2\tau_2 + A_3\tau_3}$$

Where, τ_{avg} is designated as average lifetime. A_1 , A_2 , and A_3 are denoted as pre-exponential factors, with corresponding lifetimes as τ_1 , τ_2 , and τ_3 . The average lifetime measurements of samples are mentioned in Table S1.

Table S1. Life time decay parameter details of $\text{Cs}_2\text{CuBr}_2\text{Cl}_2$, Cs_2CuCl_4 , and Cs_2CuBr_4 perovskite

Sample	τ_1 (ns)	τ_2 (ns)	τ_3 (ns)	A_1	A_2	A_3	τ_{Avg} (ns)
$\text{Cs}_2\text{CuBr}_2\text{Cl}_2$	0.09	0.86	4.67	8.03	15.06	76.90	4.53
Cs_2CuCl_4	0.06	0.65	4.04	12.52	27.41	60.07	3.78
Cs_2CuBr_4	0.03	0.49	3.76	11.79	9.82	78.39	3.64

NCs.