

Supporting Information

A novel scintillation screen for achieving high-energy ray detection with fast and full-color emission

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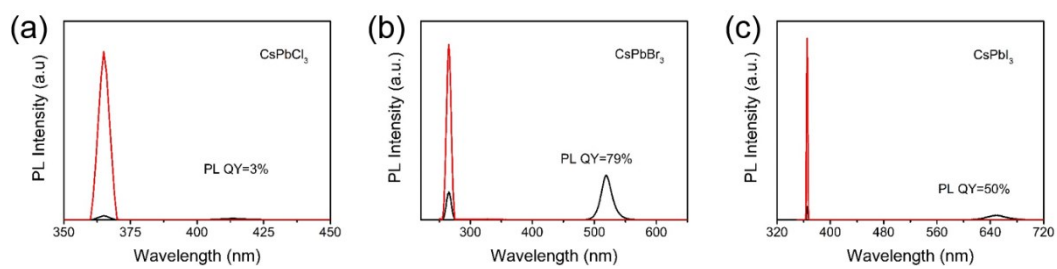


Fig. S1 PL QY graphs of a) CsPbCl₃, 3%; b) CsPbBr₃, 79%; c) CsPbI₃, 50%.

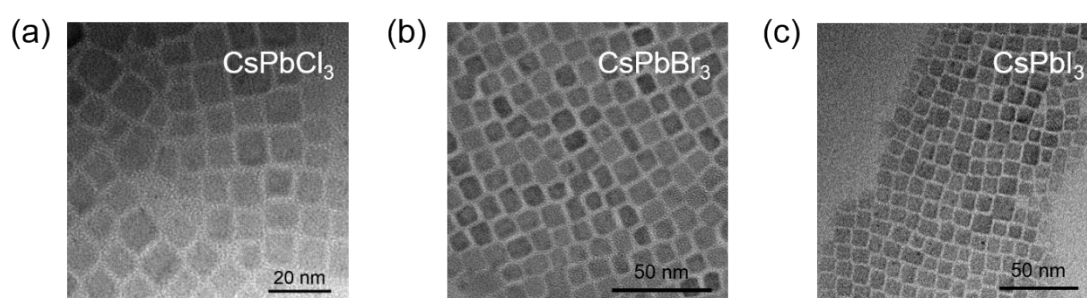


Fig. S2 TEM images of a) CsPbCl₃; b) CsPbBr₃; c) CsPbI₃.

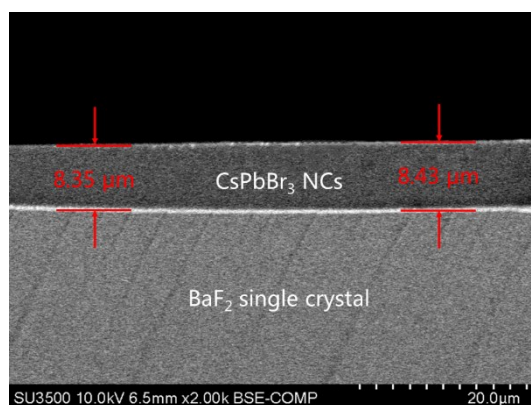


Fig. S3 The cross-sectional view SEM image of CsPbBr₃ NCs@BaF₂ scintillation screen.

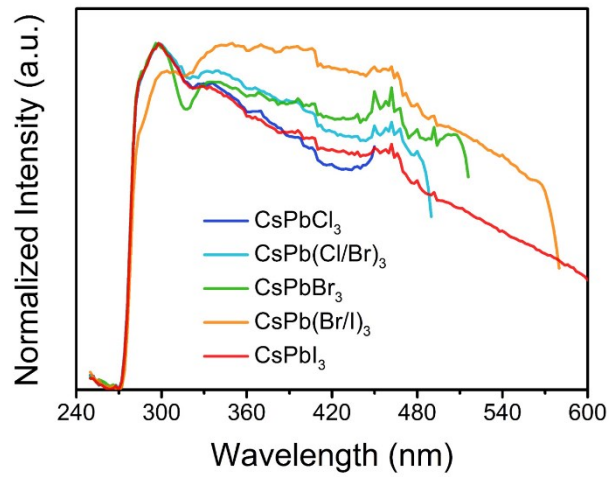


Fig. S4 PLE spectra of CsPbX₃ nanocrystals.

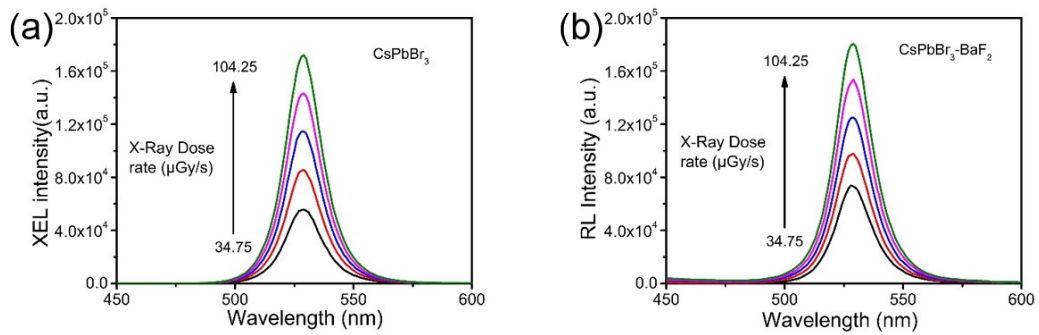


Fig. S5 XEL spectra of (a) CsPbX₃ film and (b) CsPbX₃ -BaF₂ films under X-ray with different dose rates.

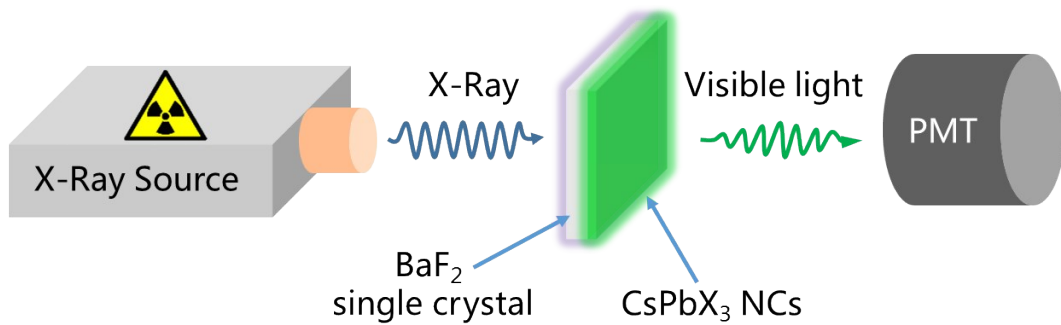


Fig.S6 The light path diagram of XEL measurement.

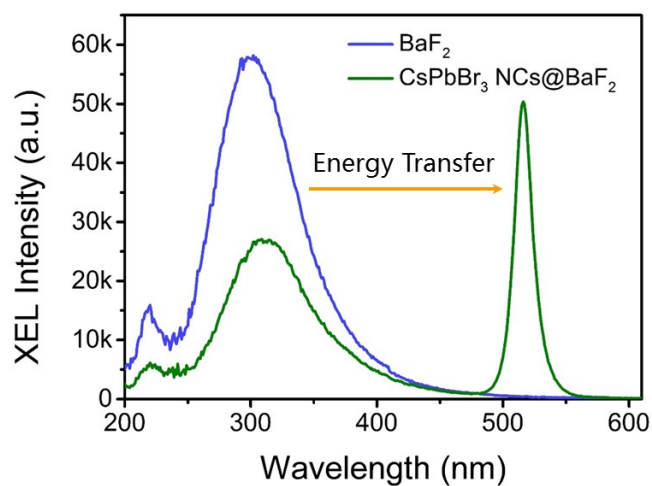


Fig.S7 The XEL spectra of BaF₂ single crystal and CsPbBr₃ NCs@BaF₂.

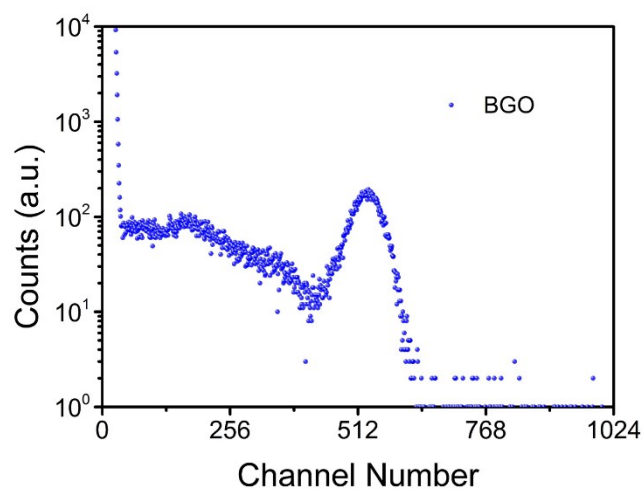


Fig. S8 γ -ray pulse height spectra of standard commercial BGO single crystal scintillators whose light yield is 8000 photons/MeV.

Table S1 PL Lifetime of CsPbX₃(X=Cl, Br and I) nanocrystals

Perovskite	τ_1 (ns)	A ₁ (%)	τ_2 (ns)	A ₂ (%)	τ_{ave} (ns)
CsPbCl ₃	2.0306	55.67	14.5866	44.33	7.596675
CsPb(Cl/Br) ₃	3.9288	41.27	17.8659	58.73	12.11406
CsPbBr ₃	7.8258	61.24	27.2447	38.76	15.35257
CsPb(Br/I) ₃	12.651	33.5	37.3357	66.5	29.06633
CsPbI ₃	13.5825	22.05	45.8836	77.95	38.76121

Table S2 PL Lifetime of CsPbBr₃ nanocrystals at different temperatures

Temperature(K)	τ_1 (ns)	A ₁ (%)	τ_2 (ns)	A ₂ (%)	τ_{ave} (ns)
80	3.1294	0.8153	23.6061	0.1847	4.128993
120	2.9121	0.8109	28.0385	0.1891	4.208029
160	4.0026	0.812	30.2848	0.188	5.339773
200	3.3651	0.7601	30.3924	0.2399	5.813495
240	5.4323	0.7433	33.9986	0.2567	8.476291
280	6.6853	0.6589	35.521	0.3411	12.7798
320	8.3396	0.5438	45.6409	0.4562	23.74754