Electronic Supplementary Material (ESI) for Nanoscale.

Solution-processed zero-dimensional all-inorganic perovskite scintillator for high resolution gamma-ray spectroscopy detection

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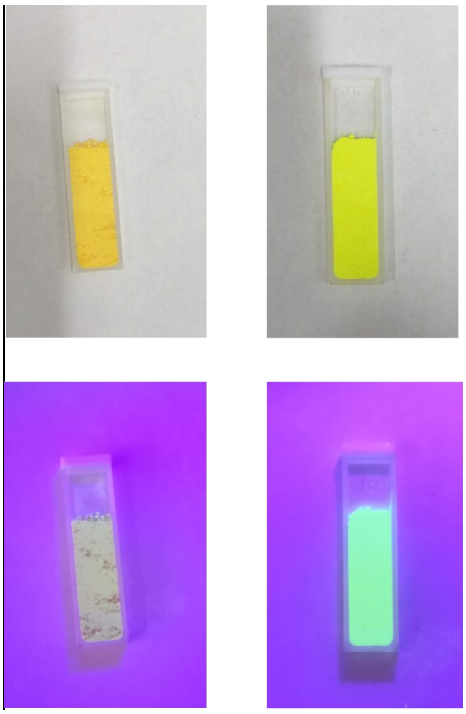

Figure S1.Optical images of $CsPbBr_3$+Cs_4PbBr_6 and $CsPbBr_3$/Cs_4PbBr_6 materials under sunlight and 405nm laser.

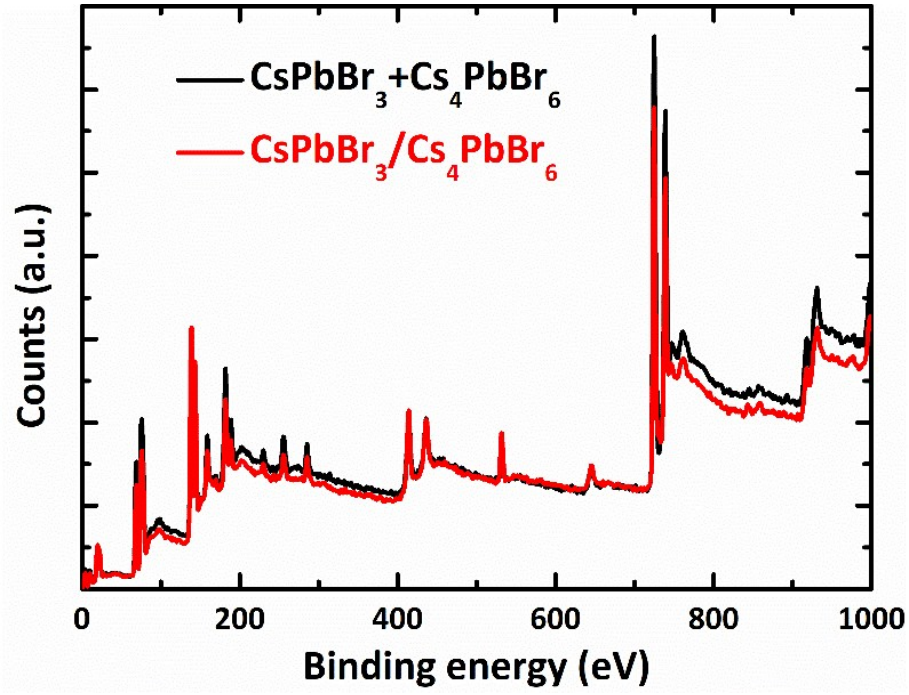

Figure S2 Full XPS spectra of $CsPbBr_3$+Cs_4PbBr_6 and $CsPbBr_3$/Cs_4PbBr_6

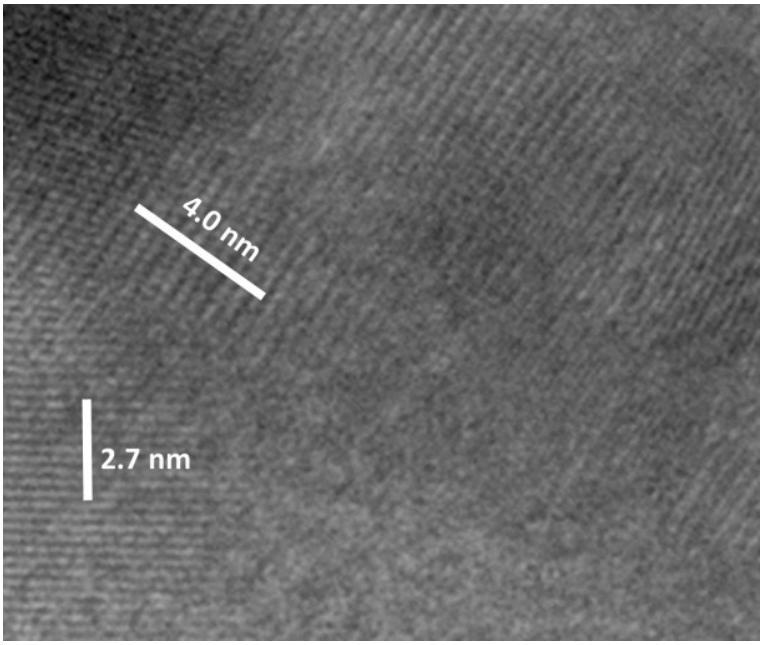

Figure S3 HRTEM image of $CsPbBr_3$/Cs_4PbBr_6.

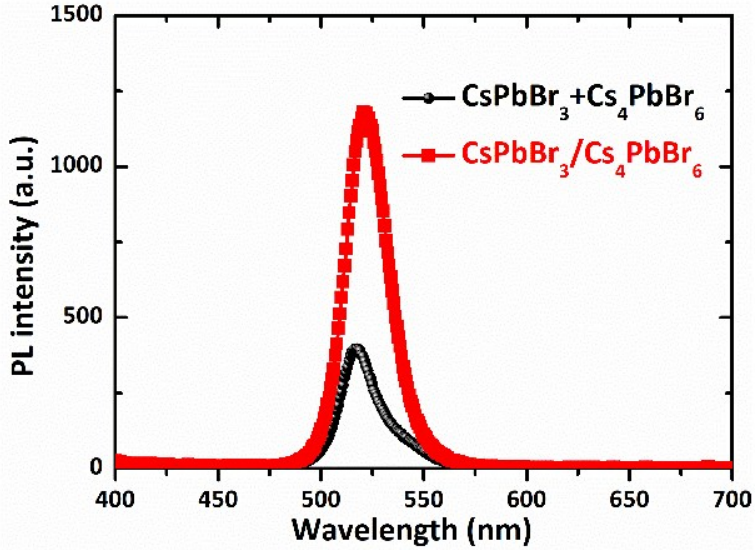

Figure S4 Photoluminescence spectra of $CsPbBr_3$+Cs_4PbBr_6 and $CsPbBr_3$/Cs_4PbBr_6

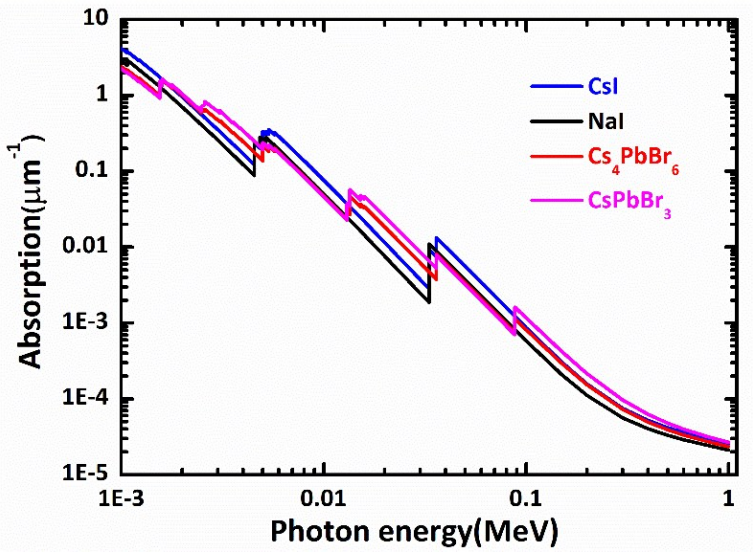

Figure S5 The attenuation coefficient of Cs_4PbBr_6, $CsPbBr_3$, NaI, and CsI as a function of energy.

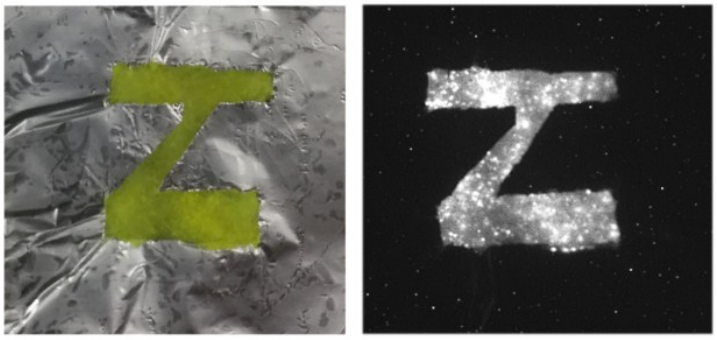

Figure S6 Optical and X-ray image of $CsPbBr_3/Cs_4PbBr_6$ powder that record by CCD camera. X-ray image excited with 40keV X-ray.

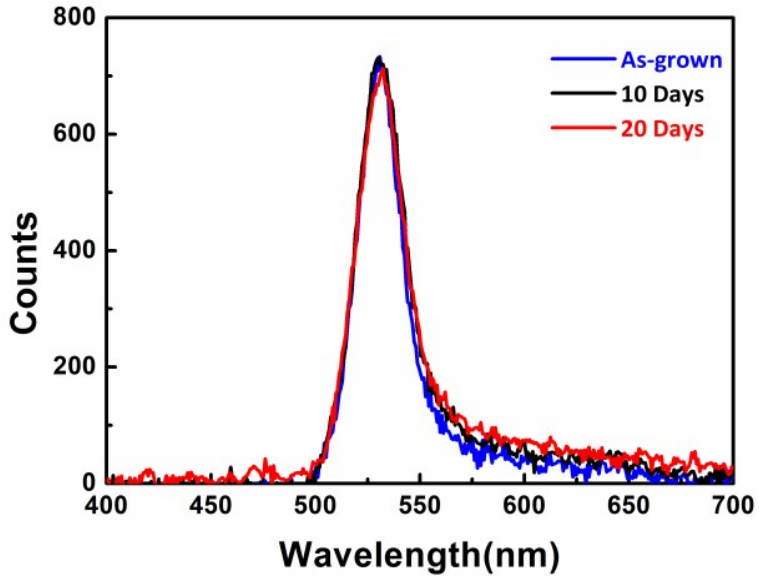

Figure S7 RL spectra of $CsPbBr_3/Cs_4PbBr_6$ material stored in air at room temperature for twenty days.

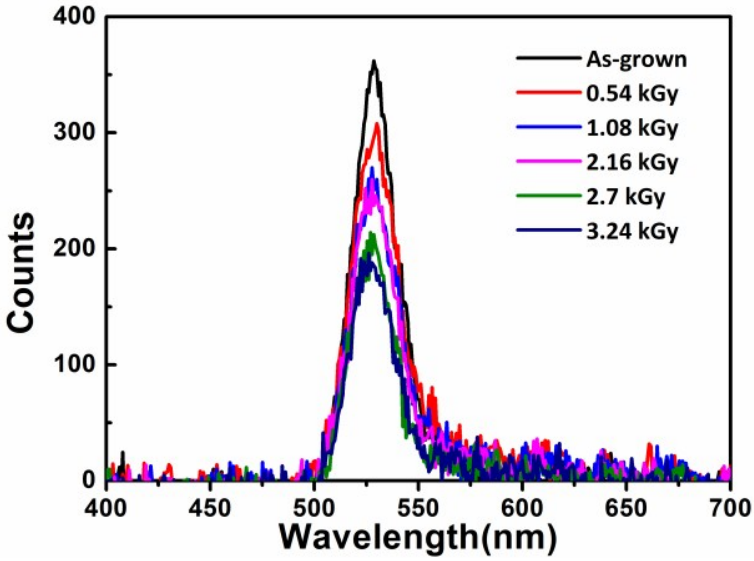

Figure S8 RL spectra of $CsPbBr_3/Cs_4PbBr_6$ material irradiated with different dosage gamma-ray

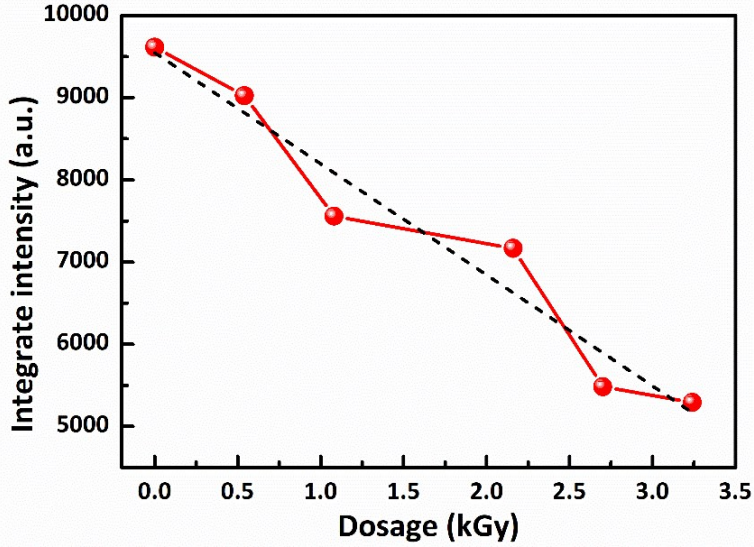

Figure S9 Radiation stability test for $CsPbBr_3/Cs_4PbBr_6$ scintillator under various dosage of Co-60 gamma-ray.

TABLE

Table S1 Summarized scintillation parameters of commercial products (from Saint-Gobain Crystal)

Materials	Emission wavelength (nm)	Decay time (ns)	Light yield (Photons/MeV)	Hygroscopic	Ref
NaI(Tl)	415	250	38000	Yes	a
$LaBr_3(Ce)$	380	16	63000	Yes	a
CsI(Na)	420	630	41000	Yes	a
BGO	480	300	8000-10000	No	a
BaF_2	220	0.6-0.8	1800	Slightly	a
$CsPbBr_3$/ Cs_4PbBr_6	525	1.3 (fast) 6.7(slow)	64000	No	This work

[a)] the data from the datasheet of Saint-Gobain Crystal inc.