Supporting information for:

Polymer composites entrapped Ce-doped $LiYF_4$ microcrystals for high-sensitivity X-ray scintillation and imaging

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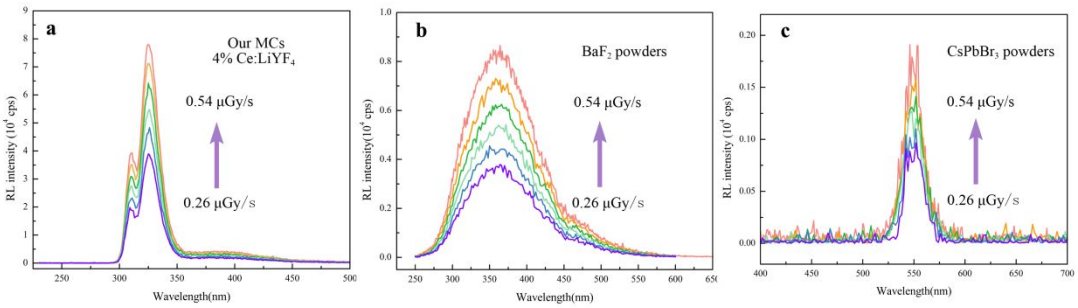

Figure S1 (a-c) RL spectra of our MCs (4%Ce:$LiYF_4$), BaF_2 and $CsPbBr_3$ powders in response to serial X-ray dose rate from 0.26 μGy/s to 0.54 μGy/s. The weight of all samples used for testing is 100 mg. BaF_2 (99.99%) and $CsPbBr_3$ (98%) powders were purchased from Shanghai Aladdin Bio-Chem Technology Co., LTD and Tokyo Chemical Industry Co., LTD, respectively.

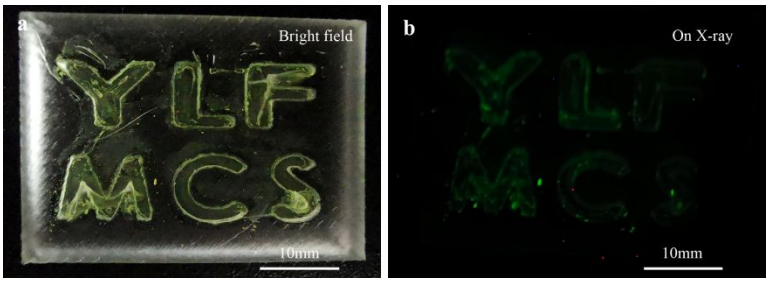

Figure S2 (a-b) Photographs of only QDs (~50mg/ml) on PDMS substrates under bright field and X-ray illumination. The QDs exhibit a very weak RL under 0.54 μGy/s X-ray excitation.

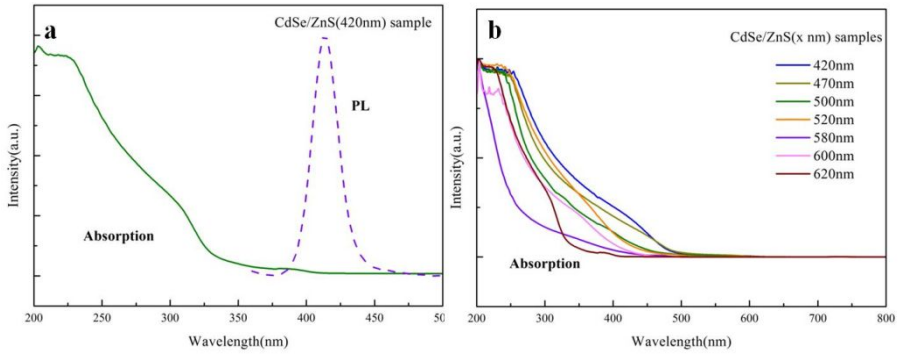

Figure S3 (a) Absorption and PL spectra of typical CdSe/ZnS core/shell sample. (b) Serial absorption spectra of CdSe/ZnS core/shell samples.

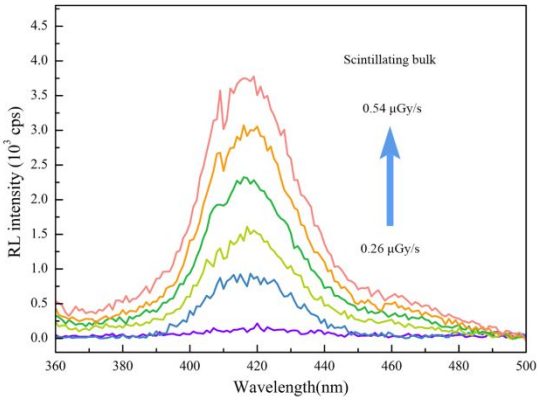

Figure S4 RL spectra of the scintillating bulk (Sample **1**) under various X-ray dose rate from 0.26 μGy/s to 0.54 μGy/s.

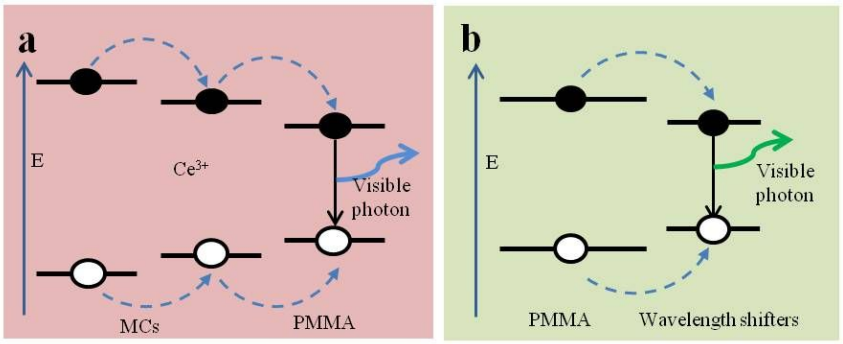

Figure S5 (a-b) Another two possible energy-conversion routes in our scintillating bulks.

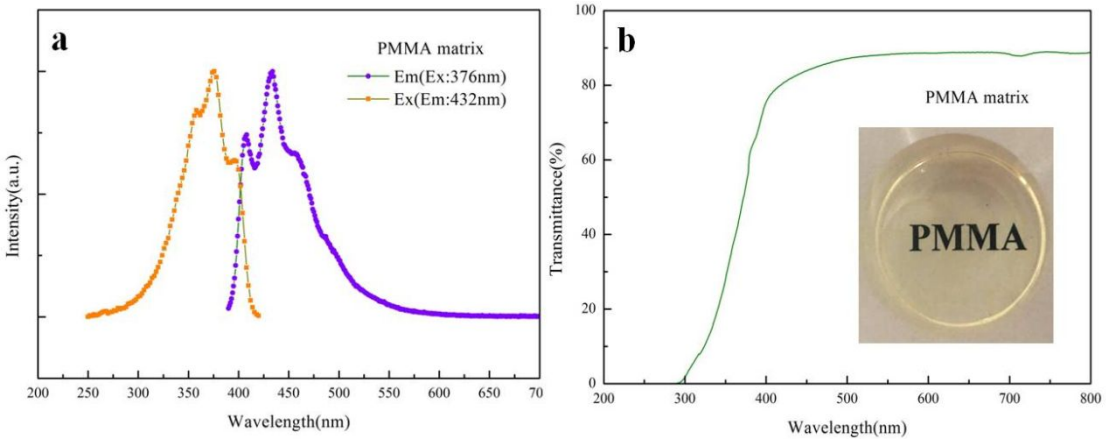

Figure S6 (a) Excitation and emission spectra of PMMA matrix. (b) Transmittance spectrum of PMMA matrices. The inset shows the bright field photograph of PMMA matrix. The letters are under the sample.

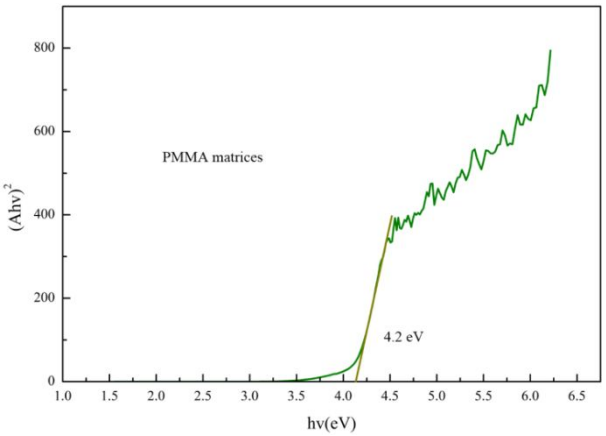

Figure S7 Energy band of PMMA matrices calculated by diffused reflectance spectrum.

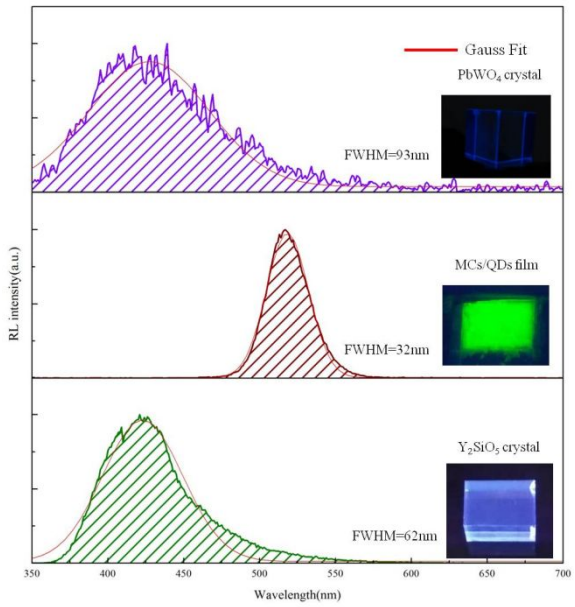

Figure S8 RL of our scintillating film and commercial bulk inorganic crystals ($PbWO_4$ and Y_2SiO_5) under X-ray excitation (size information: our scintillating film (40mm×20mm), $PbWO_4$ crystal (20mm×20mm×20mm) and Y_2SiO5 crystal (18mm×18mm×25mm)). The insets show the photographs of corresponding samples under X-ray excitation (0.54 μGy/s). The FWHM results are obtained from red lines fitted with a Gaussian function, exhibiting the spectra width of RL intensity.

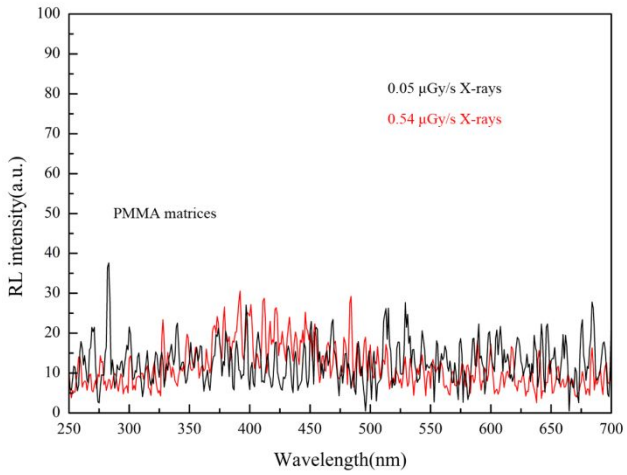

Figure S9 RL spectra of PMMA matrices under X-ray excitation at 0.05 μGy/s and 0.54 μGy/s.

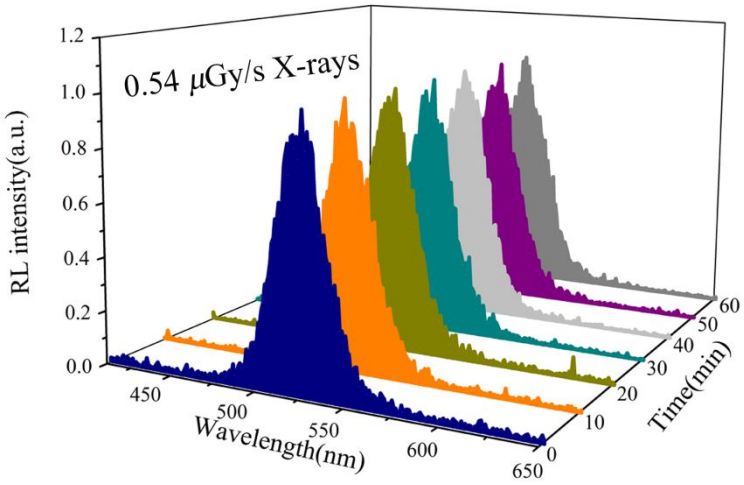

Figure S10 RL intensity of the film under continuous 0.54 μGy/s X-ray irradiation for 60 minutes shows a favorable radiation hardness.

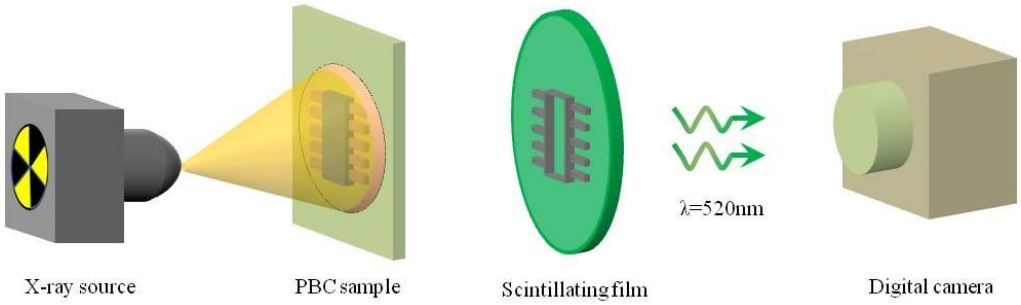

Figure S11 A home-made X-ray imaging system for X-ray radiography.