Supporting Information

Melt-Grown Large-Sized Cs_2TeI_6 Crystals for X-Ray Detection

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1. The calibration of X-ray dose rate.

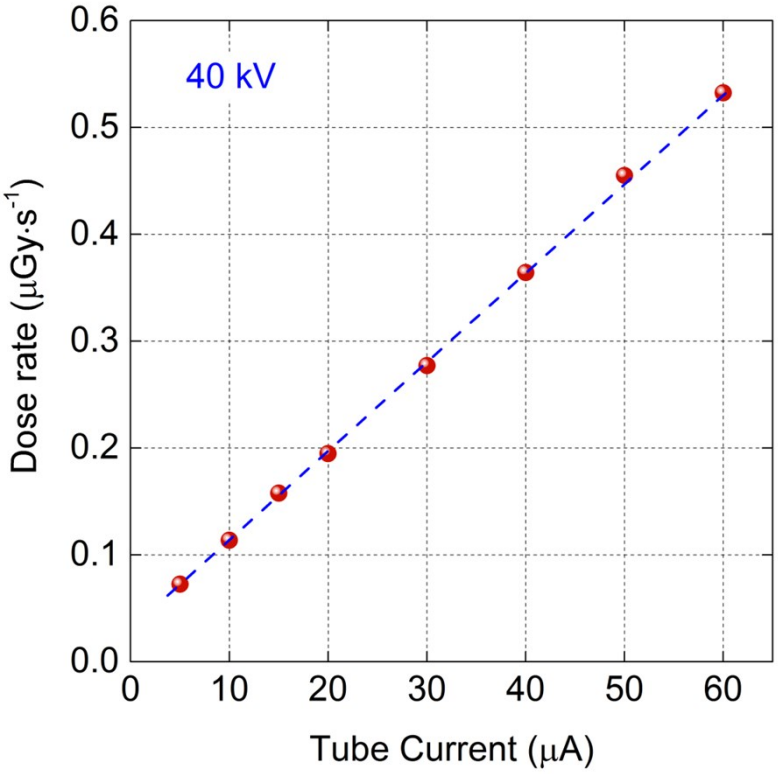

Fig. S1 The relationship between the dose rate and current of X-ray tube.

2. The characterization of photoresponse of Cs_2TeI_6 crystal.

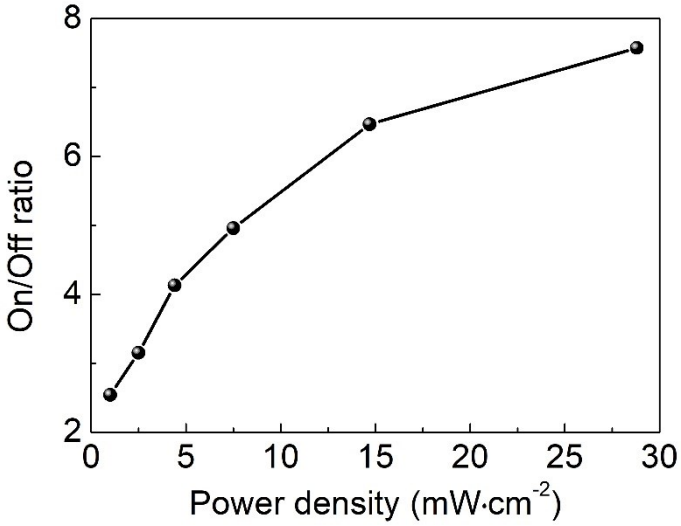

Fig. S2 Power-dependent ratio of on-off current illuminated by blue light with a wavelength of 425 nm under 100 V.

3. The calculation of signal-to-noise ratio.

As shown in Fig. S3, the signal current (I_{signal}) was derived by subtracting the average photocurrent ($\bar{I}_{photo}$) by the average dark current ($\bar{I}_{dark}$). The noise current (I_{noise}) was obtained by calculating the standard deviation of the photocurrent.

$$I_{signal} = \bar{I}_{photo} - \bar{I}_{dark}$$

$$I_{noise} = \sqrt{\frac{1}{N}\sum_{i}^{N}(I_i - \bar{I}_{photo})^2}$$

Then the signal-to-noise ratio (SNR) was calculated using

$$\mathrm{SNR} = I_{signal} / I_{noise}$$

For example, for Cs_2TeI_6 device with 5 V bias and under 277.1 nGy·s^{-1}, the calculated average photocurrent, dark current, and noise current was 2.243 pA, 1.903 pA, and 0.014 pA, respectively, resulting in a SNR value of 24.3.

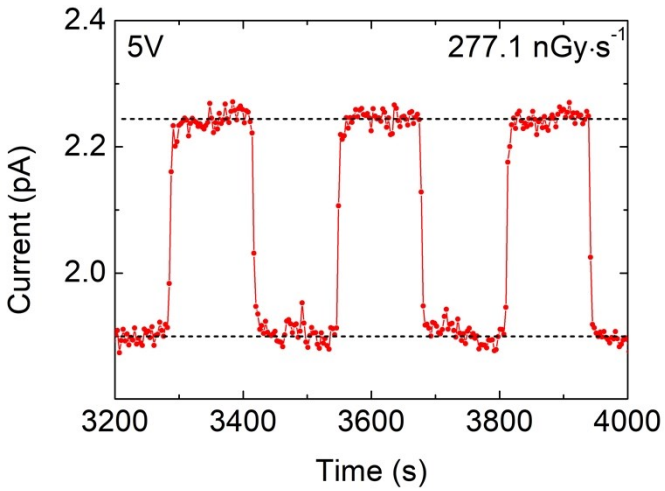

Fig. S3. Device response to X-rays (277.1 nGy·s^{-1} dose rate) on tuning the X-ray source on and off.