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Optimization of $CsPbBr_3$/PVDF composite for enhanced UV photodetection application

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Supporting Figures

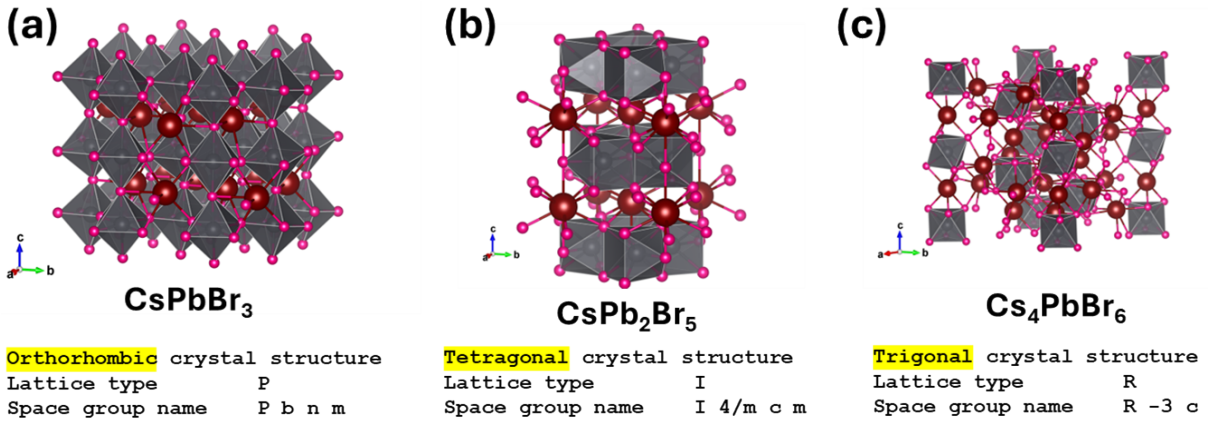

Fig. S1. Crystal structures of different caesium lead bromide perovskites: (a) $CsPbBr_3$. (b) $CsPb_2Br_5$. (c) Cs_4PbBr_6.[1–3]

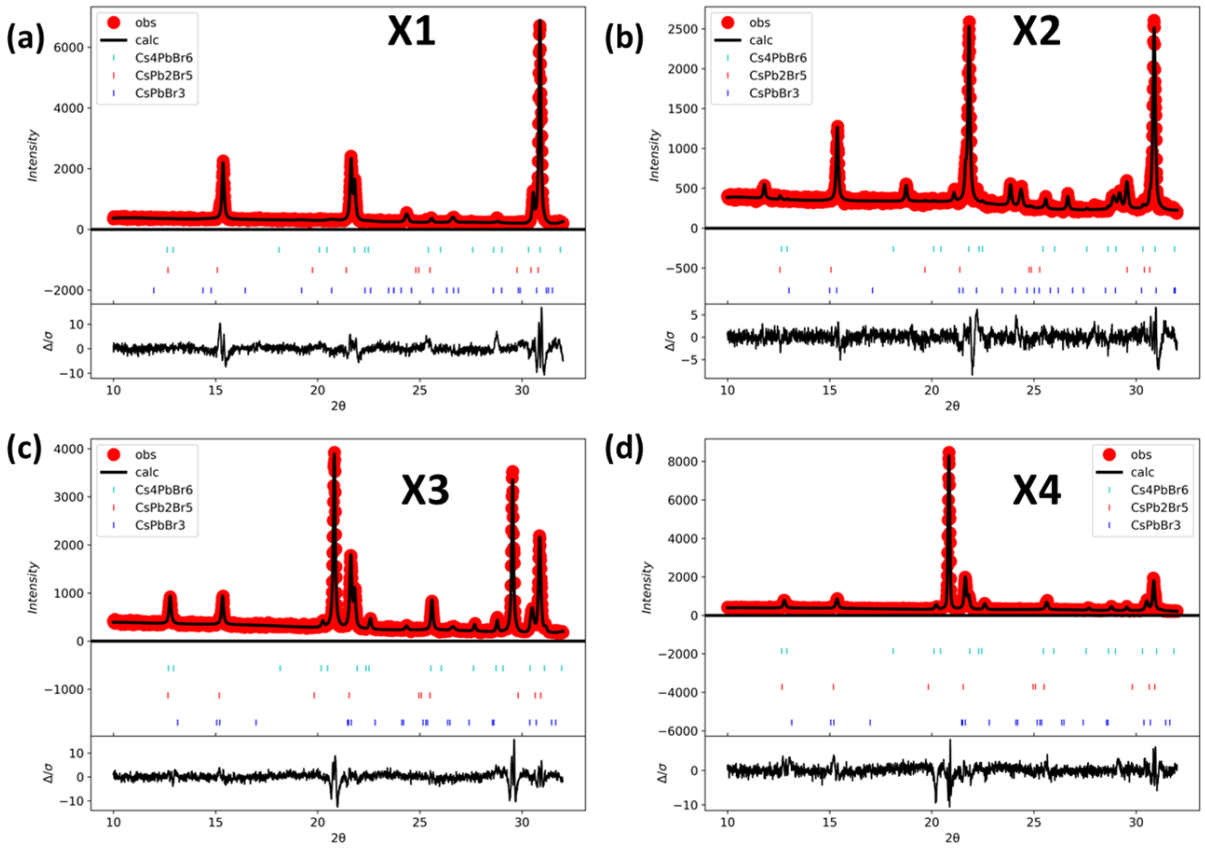

Fig. S2. Rietveld refinement of powder XRD patterns of different drop-casted caesium lead bromide perovskites.

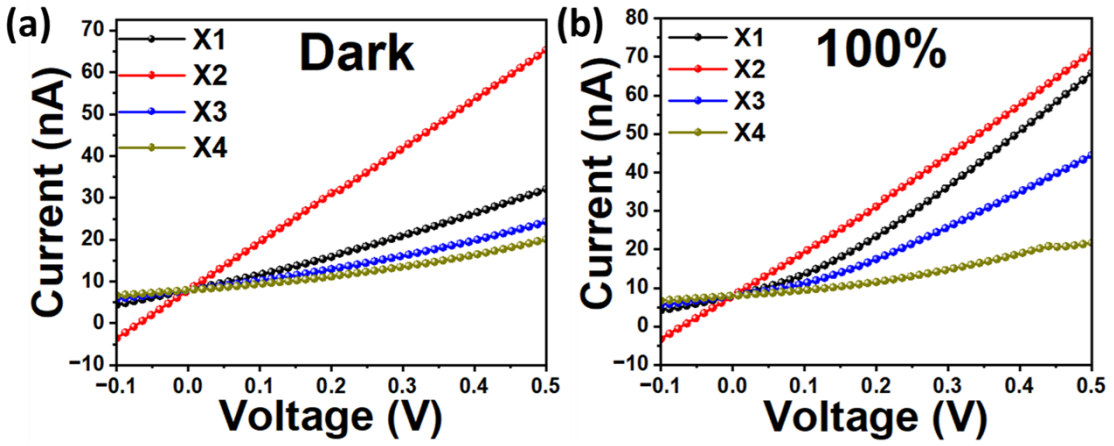

Fig. S3. The current-voltage I-V curves of the devices of different caesium lead bromide perovskites/PVDF composites-based photodetectors under (a) Dark condition. (b) 100% of UV light intensity.

Supporting Notes

Equations used for calculation of Photodetector parameters are shown through the following equations:

$$R_\lambda = \frac{\Delta I}{P_\lambda \times A} \quad \textbf{(1)}$$

$$\xi = \frac{I_{Photo} - I_{Dark}}{I_{Dark}} \quad \textbf{(2)}$$

$$IQE\ (\%) = \frac{h \times c \times R_\lambda}{e \times \lambda} \times 100\% \quad \textbf{(3)}$$

$$D^* = \frac{R_\lambda}{(2 \times e \times J_{Dark})^{\frac{1}{2}}} \quad \textbf{(4)}$$

Where:

R_λ: The photoresponsivity of a photodetector which is the photo-current generated through the effective photodetector area per incident light unit power.

ξ**:** The photosensitivity of a photodetector which is the ratio between the photo-current change under the effect of light illumination and the dark current.

$IQE\ (\%)$: The internal quantum efficiency of a photodetector to estimate the efficiency of the carrier transport.

D^*: The detectivity of a photodetector which is related to the photodetector quality.

I_{Photo}: The current under light illumination.

I_{Dark}: The current under no illumination.

ΔI: The photo-current change under the effect of light illumination.

P_λ: The incident light intensity (W/cm^2).

A**:** The effective area of photodetector (cm^2).

h**:** The plank's constant.

c**:** The light speed.

e: The electron charge.

λ: The wavelength of the incident light (nm).

References

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