

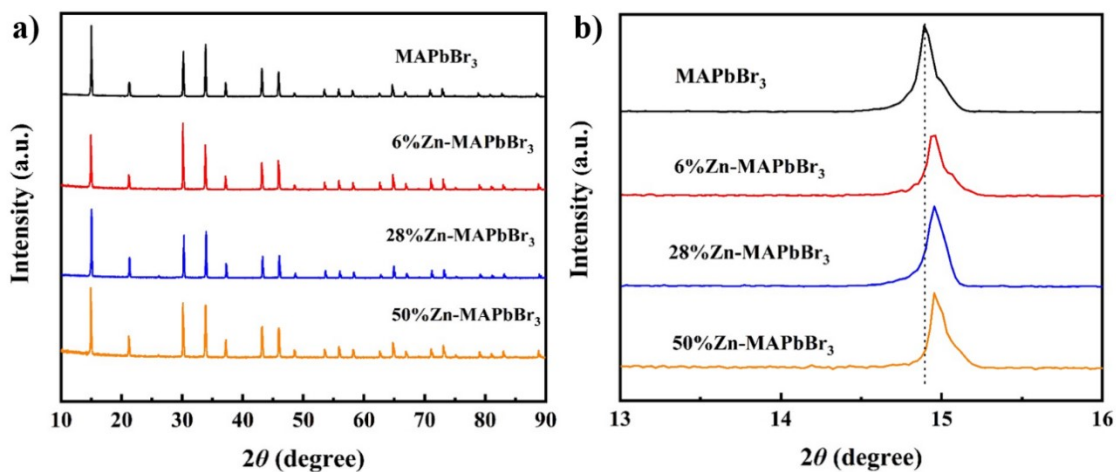
## Supporting Information

### Zn alloyed MAPbBr<sub>3</sub> crystals for improved thermoelectrics and photocatalyst

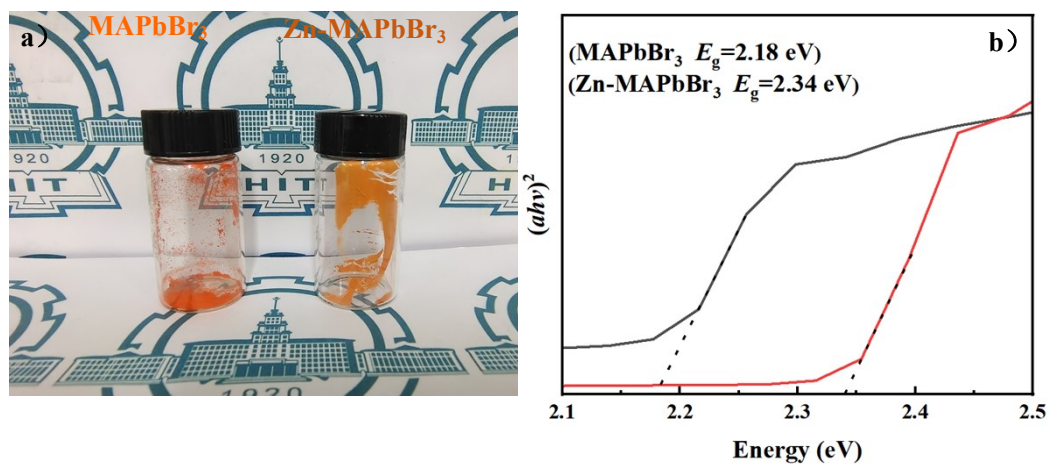
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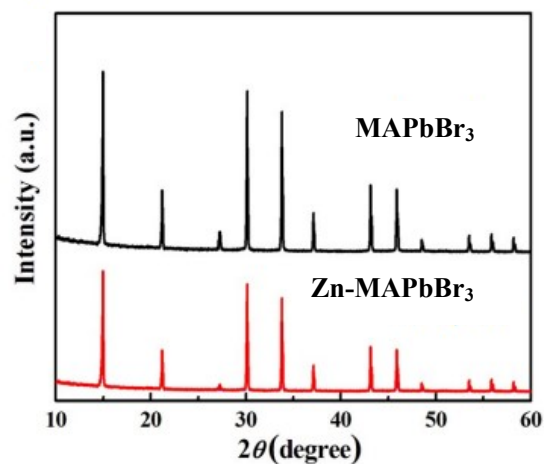
E-mail: [wangqun5992@hit.edu.cn](mailto:wangqun5992@hit.edu.cn);



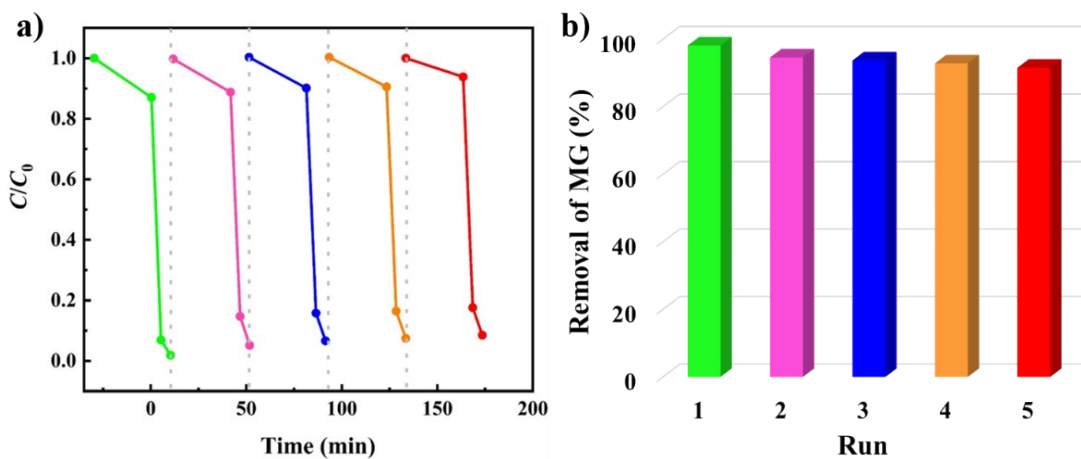
**Fig. S1** a) XRD patterns and b) zoomed-in XRD peaks of different Zn:Pb molar ratios of the precursors.



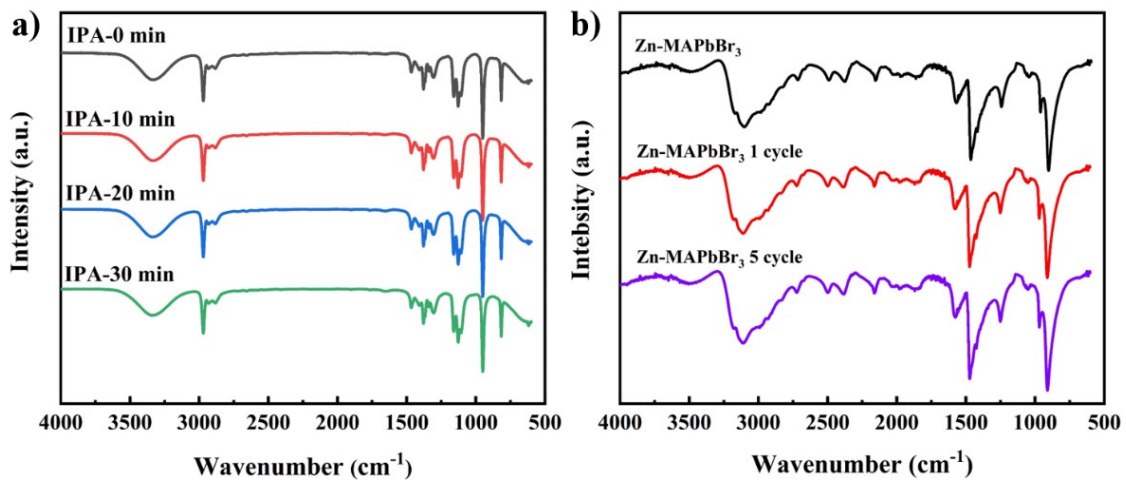
**Fig. S2** Digital photographs of the orange-red color MAPbBr<sub>3</sub> and orange Zn-MAPbBr<sub>3</sub> powder samples and their band gap values from Tauc plots.



**Fig. S3** XRD patterns of MAPbBr<sub>3</sub> and Zn-MAPbBr<sub>3</sub> after 3 weeks indicating no appreciable change in the crystal structure.



**Fig. S4** (a, b) Schematic photocatalytic reaction cycle stability after the 1<sup>st</sup> and 5<sup>th</sup> reaction cycle and the removal of MG still remain ~92%.



**Fig. S5** (a, b) FTIR spectra of IPA solvent and Zn-MAPbBr<sub>3</sub> sample for different time, showing no evident change for solvent and catalyst.