

Electronic Supplementary Information

Photoreversible luminescence switching of CsPbI₃ nanocrystals sensitized by photochromic AgI nanocrystals

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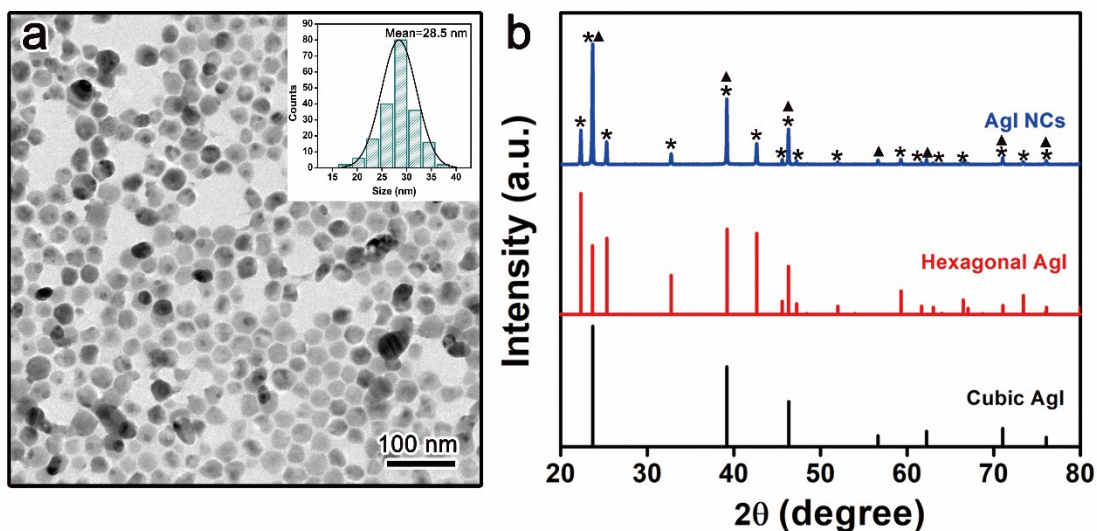


Fig. S1 (a) TEM image of AgI NCs with an average size of 28.5 nm. The inset shows the corresponding particle size distribution histogram. (b) XRD pattern of the synthesized AgI NCs with a mixture phase of hexagonal and cubic phases. The standard XRD patterns for hexagonal AgI (JCPDS No. 78-1613) and cubic AgI (JCPDS No. 78-0641) are also present in the bottom. The peaks corresponding to the hexagonal AgI and cubic AgI are marked with asterisks and triangles, respectively.

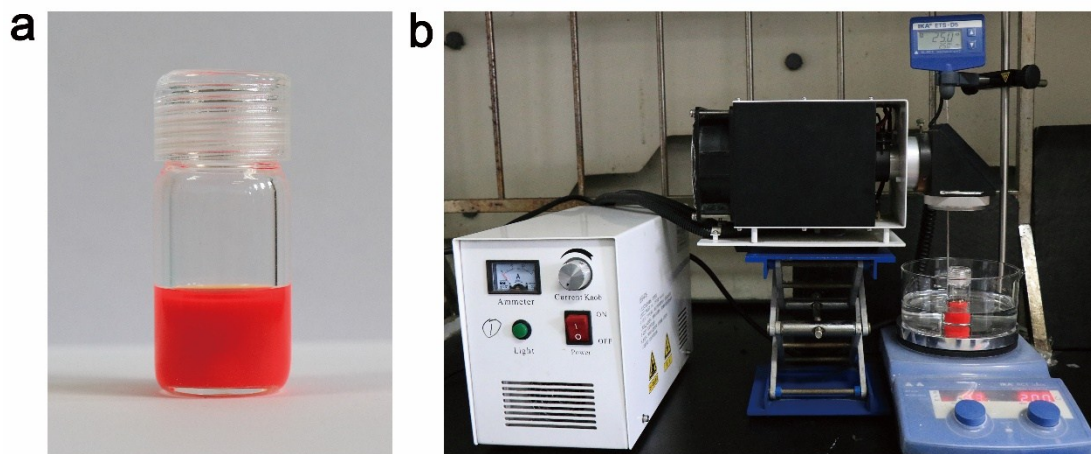


Fig. S2 Photographs of (a) customized quartz vial loading the mixture solution of CsPbI₃ NCs and AgI NCs; and (b) the reaction set-up.

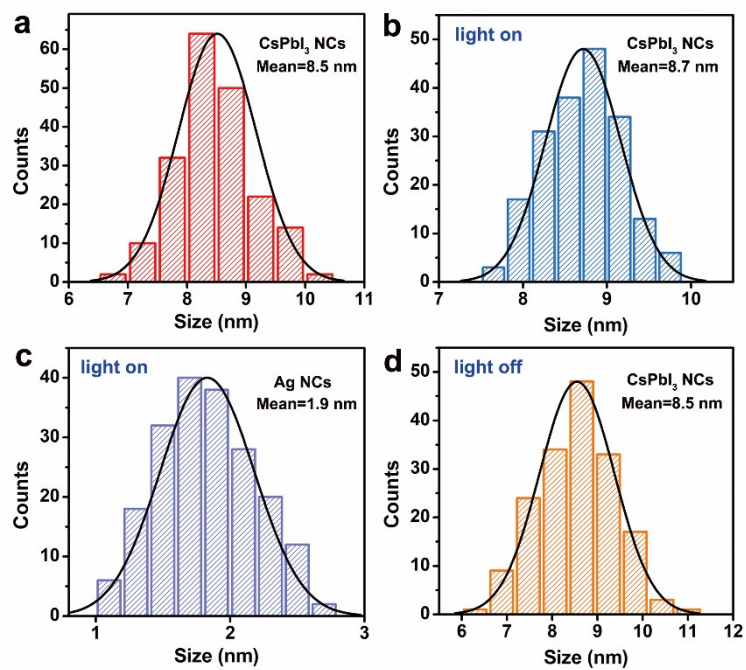


Fig. S3 (a-d) Size distribution histogram of CsPbI₃ NCs (a) before and (b) after light irradiation, (c) generated Ag NCs after illumination, (d) CsPbI₃ NCs after light off.

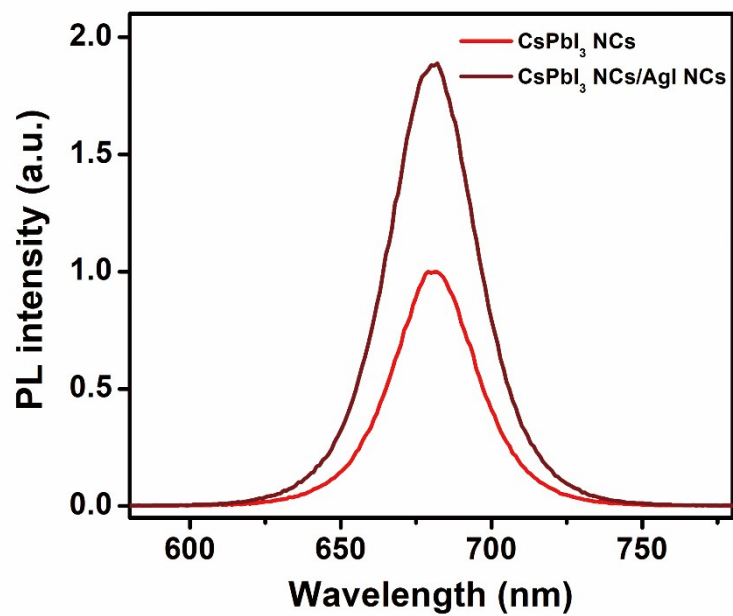


Fig. S4 PL spectra of CsPbI₃ NCs (red curve) and the mixture of CsPbI₃ and AgI NCs (brown curve) after stirring in dark condition for 20 min.

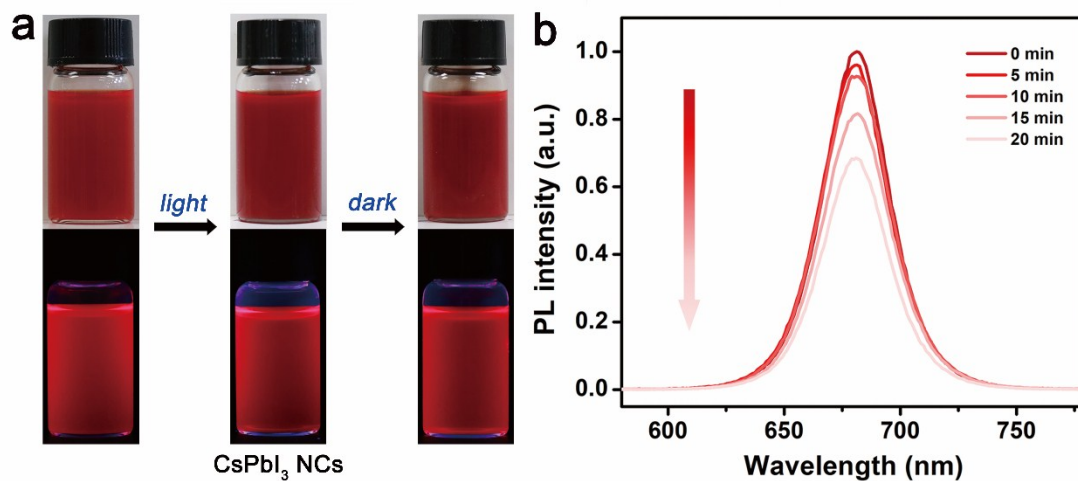


Fig. S5 (a) Photographs of the solution containing CsPbI₃ NCs after light on/off treatment. Photos were taken under daylight and UV light ($\lambda=365$ nm), respectively. (b) PL spectra of CsPbI₃ NCs during the light irradiation process.

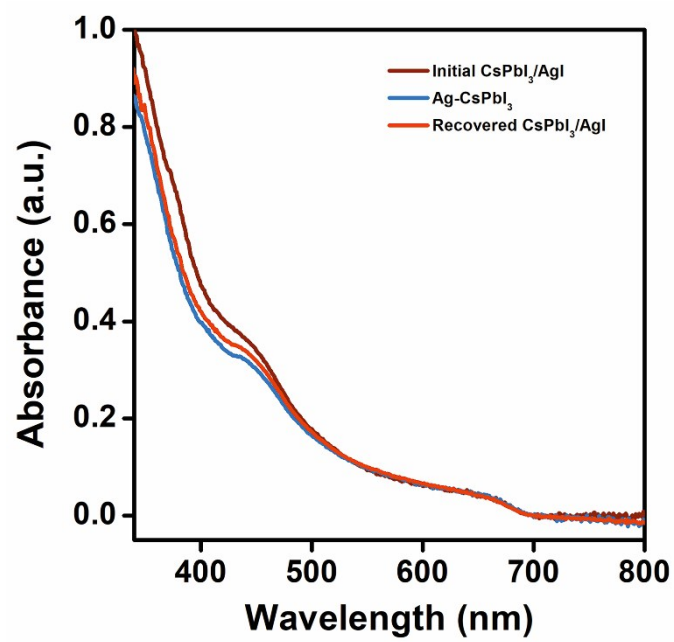


Fig. S6 The UV-vis spectra of initial CsPbI₃, Ag-CsPbI₃ obtained after irradiating for 20 min, and CsPbI₃ NCs after stored in dark for one hour.

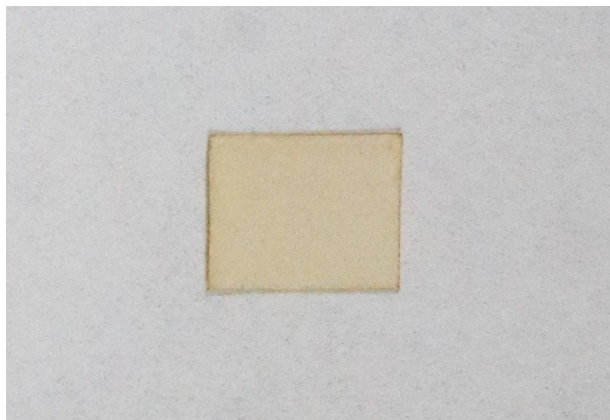


Fig. S7 Photograph of starch paper treated in CsPbI₃ and AgI mixture solution after stored in the dark for 1 hour.

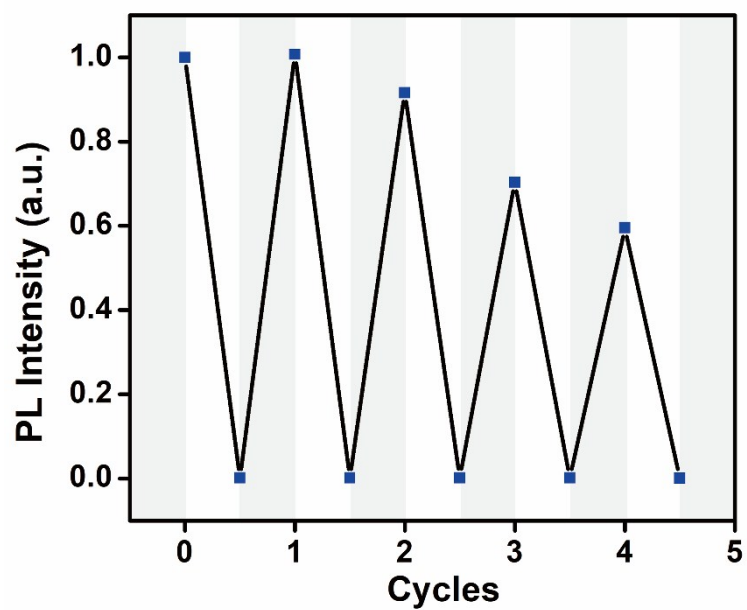


Fig. S8 The PL intensity change in CsPb(Br/I)₃ and AgI hybrid system in light on/off cycles. The white parts and grey shades represent light on and light off, respectively.

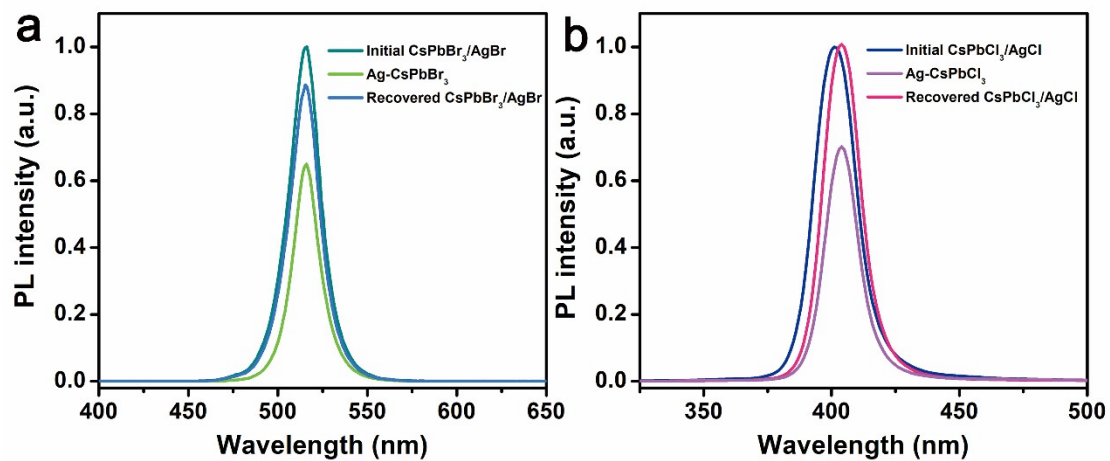


Fig. S9 PL spectra of (a) CsPbBr₃/AgBr and (b) CsPbCl₃/AgCl systems after irradiating for 20 min and then stored in dark for one hour.

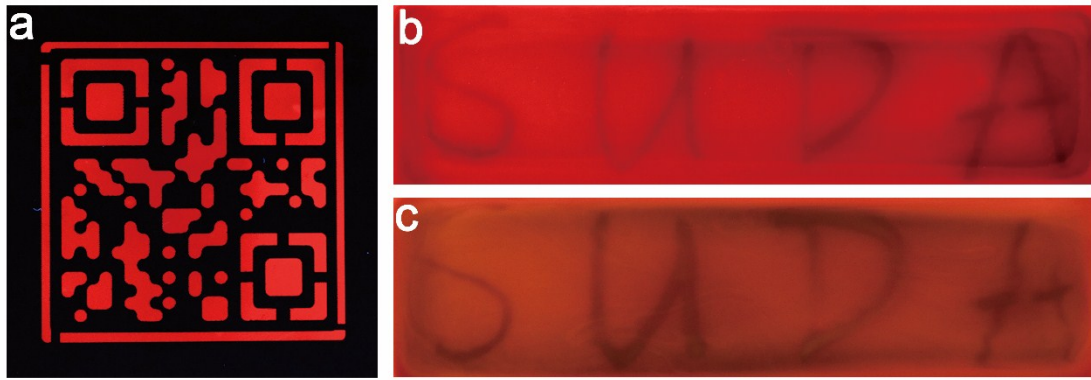


Fig. S10 (a) Photographs showing the rewritable plate covered by a mask with a QR code pattern under UV light ($\lambda=365$ nm) before irradiation. Photos of rewritable plates showing characters of “SUDA” in (b) CsPbI₃ and (c) CsPb(Br/I)₃ systems after irradiation for 5 min.