Supporting Information

Low temperature solution-processable cesium lead bromide microcrystals for light conversion

Quyet Van Le[†], Jong Won Lee[††], Woonbae Sohn[†††], Ho Won Jang[†††], Jong Kyu Kim[††]*, and Soo Young Kim[†]**

[†]School of Chemical Engineering and Materials Science, Integrative research center for two-dimensional functional materials, Chung-Ang University, 84 Heukseok-ro, Dongjak-gu, Seoul, 06974, Republic of Korea

[††] Department of Materials Science and Engineering, Pohang University of Science and Technology (POSTECH), Pohang, Gyeongbuk, 790-784, Republic of Korea

[†††]Department of Materials Science and Engineering, Research Institute of Advanced Materials, Seoul National University, Seoul 08826, Republic of Korea

Figure S1. Optical images of $PbBr_2$:CsBr/DMSO before adding HBr. The precursors were prepared by mixing $PbBr_2$ and CsBr in DMSO solvent with different concentrations of 5, 10, 20, 30, and 40 wt%, which is denoted as 1, 2, 3, 4, and 5. The volume of DMSO is fixed as 1 mL.

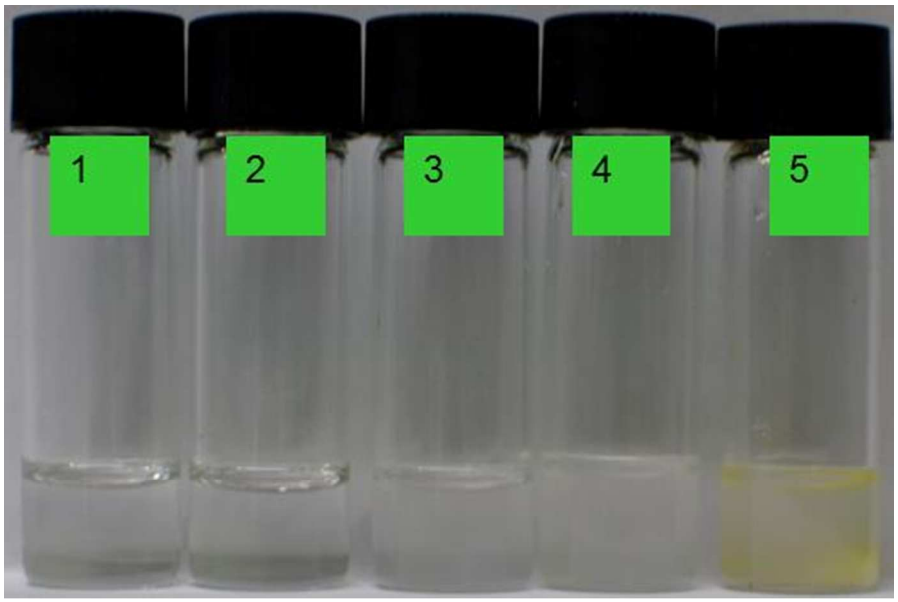

Figure S2. Photographs showing the formation of $CsPbBr_3$ MCs in HBr and its transformation to Cs_4PbBr_6 MCs on adding DMSO.

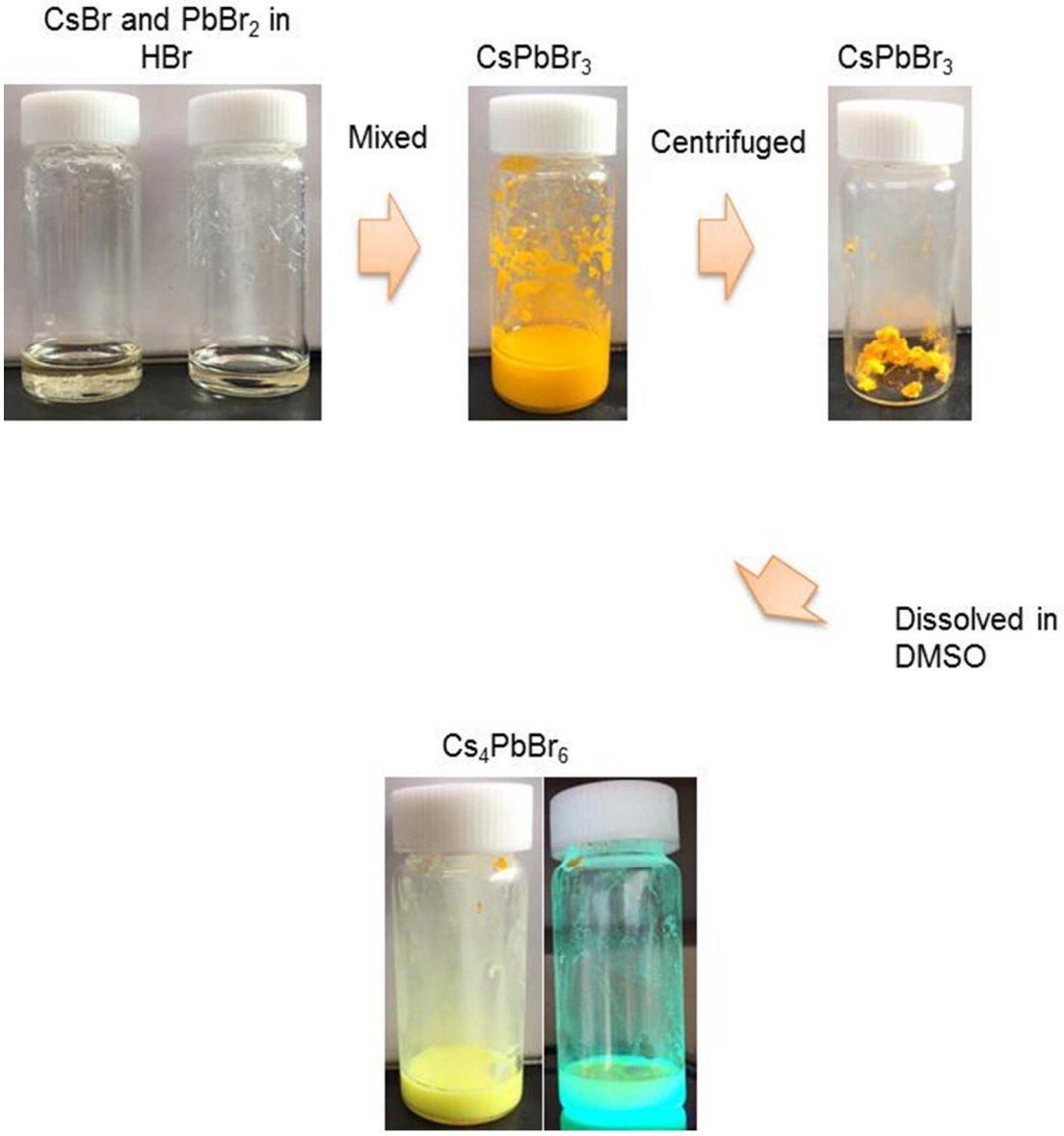

Figure S3. (a) SEM image and (b) XRD pattern of $CsPbBr_3$ MCs formed using only HBr as the solvent.

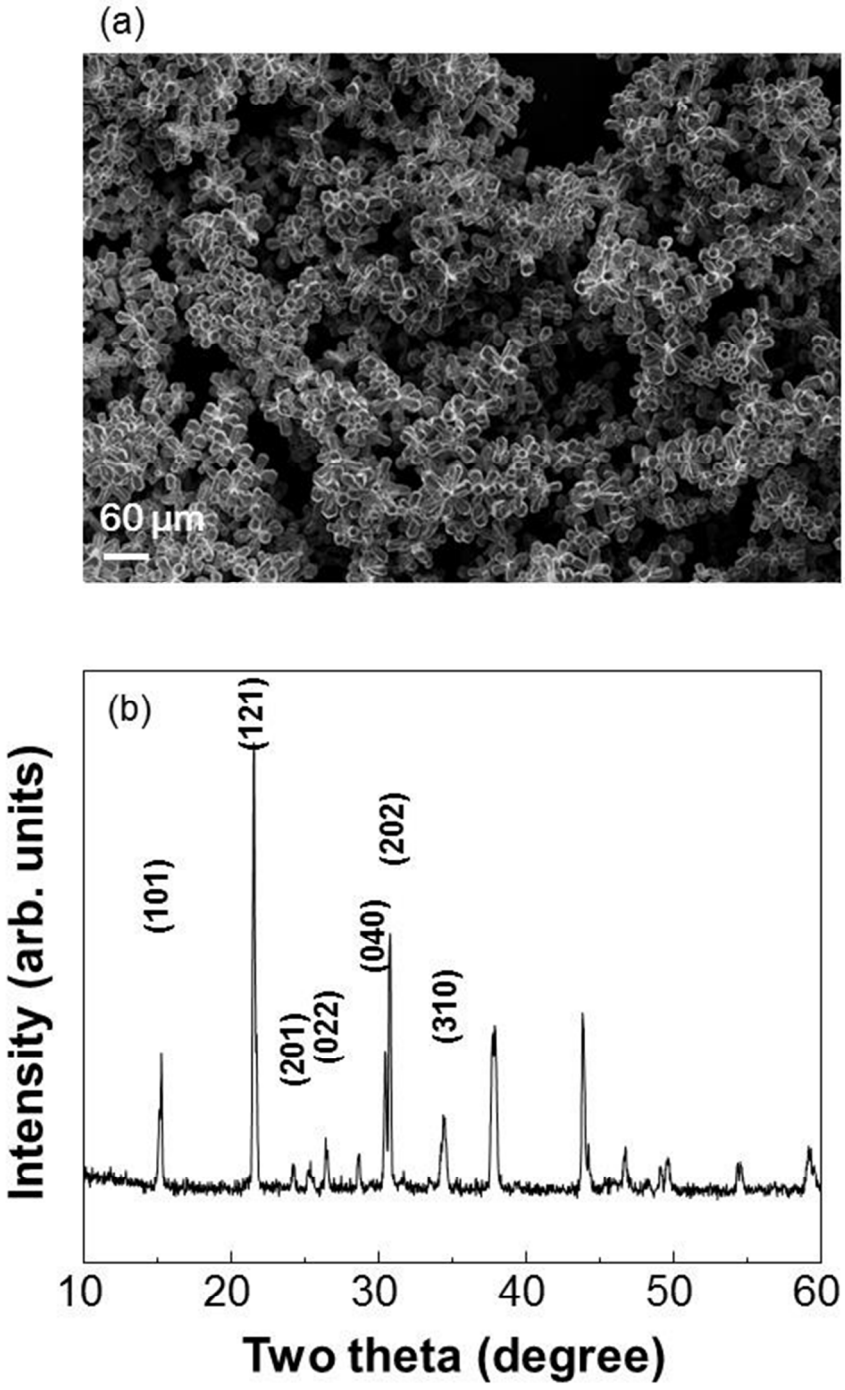

Figure S4. (a) SEM image and (b) XRD pattern of Cs_4PbBr_6 MCs produced from $CsPbBr_3$ MCs in DMSO

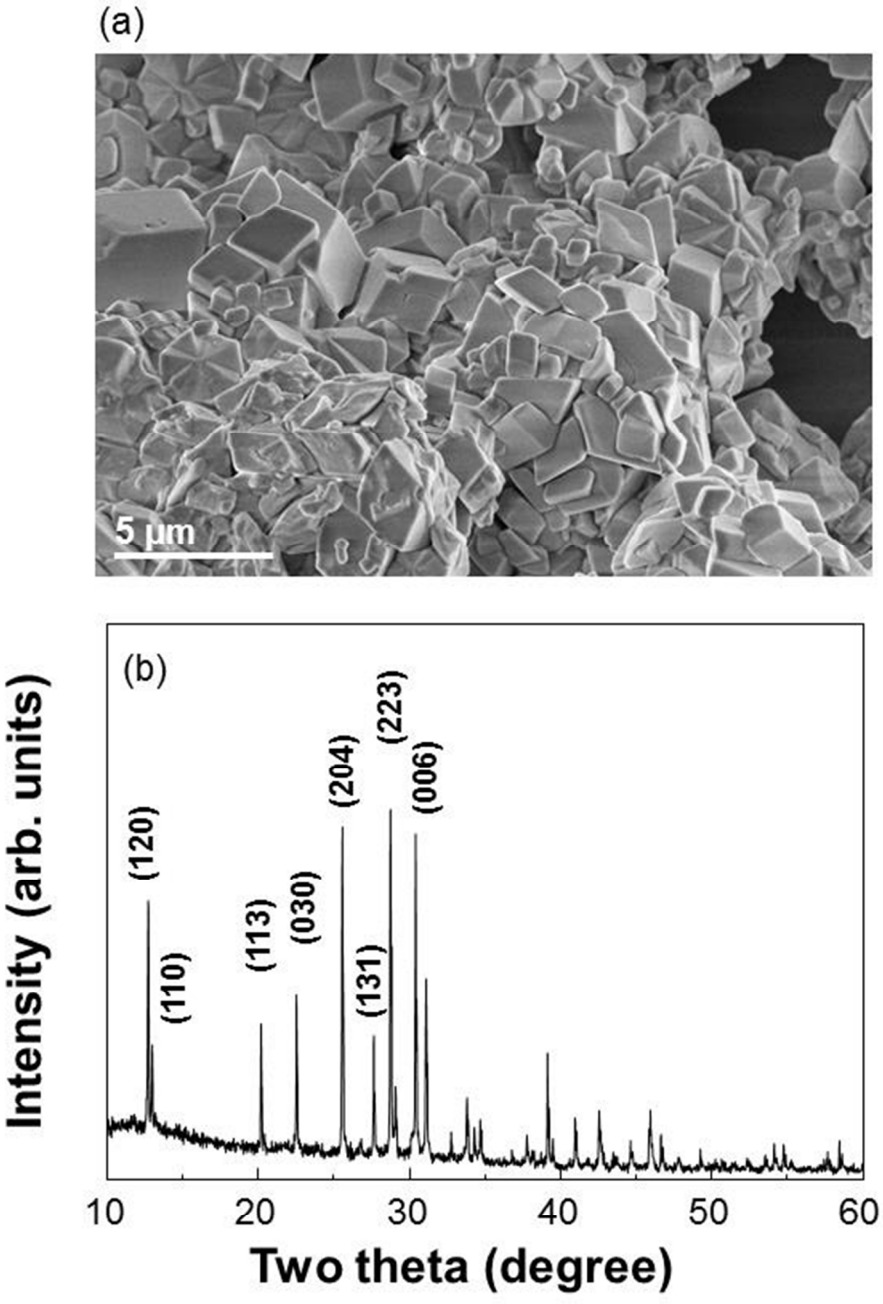

Figure S5. (a) SEM image and (b) XRD pattern of $CsPbBr_3$ QDs.

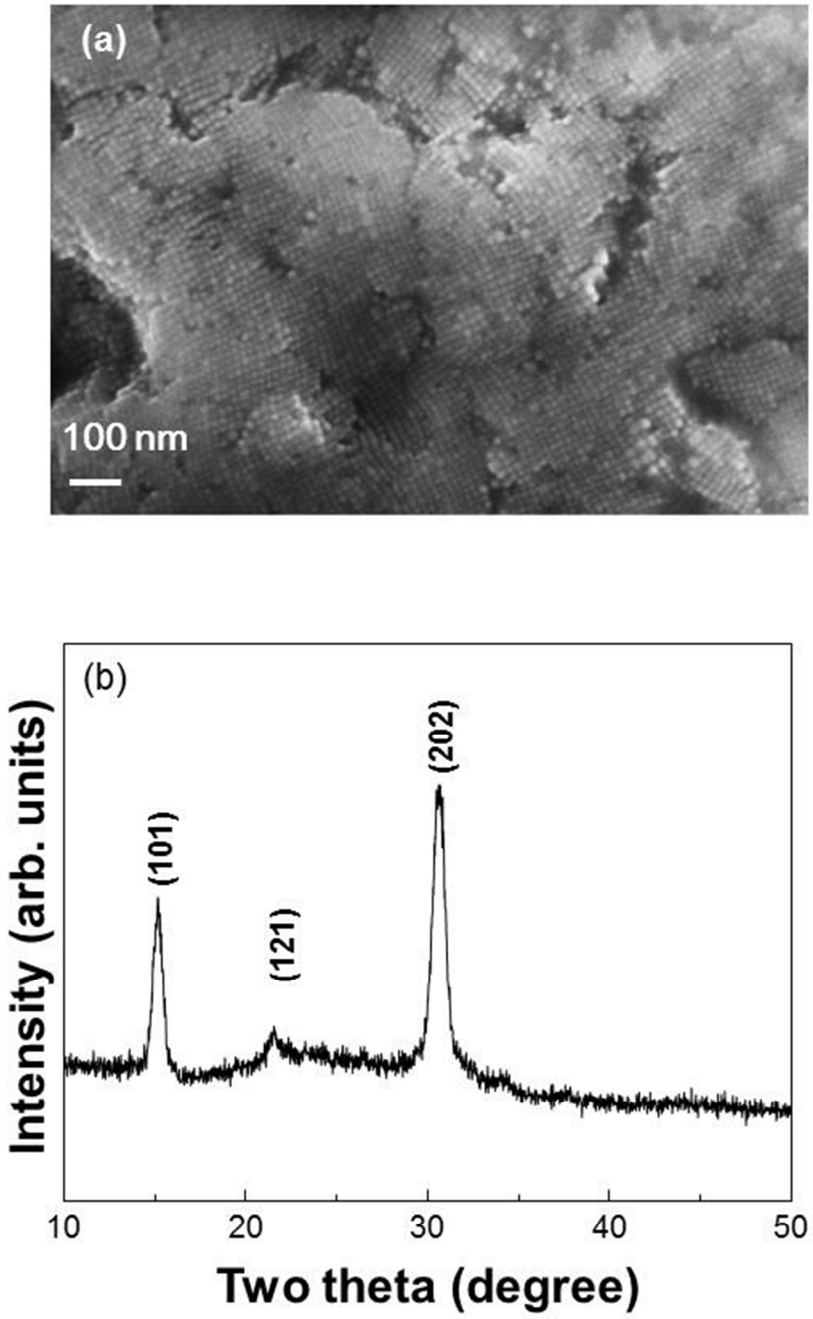

Figure S6. Schematic crystal structures of $CsPbBr_3$ and Cs_4PbBr_6.

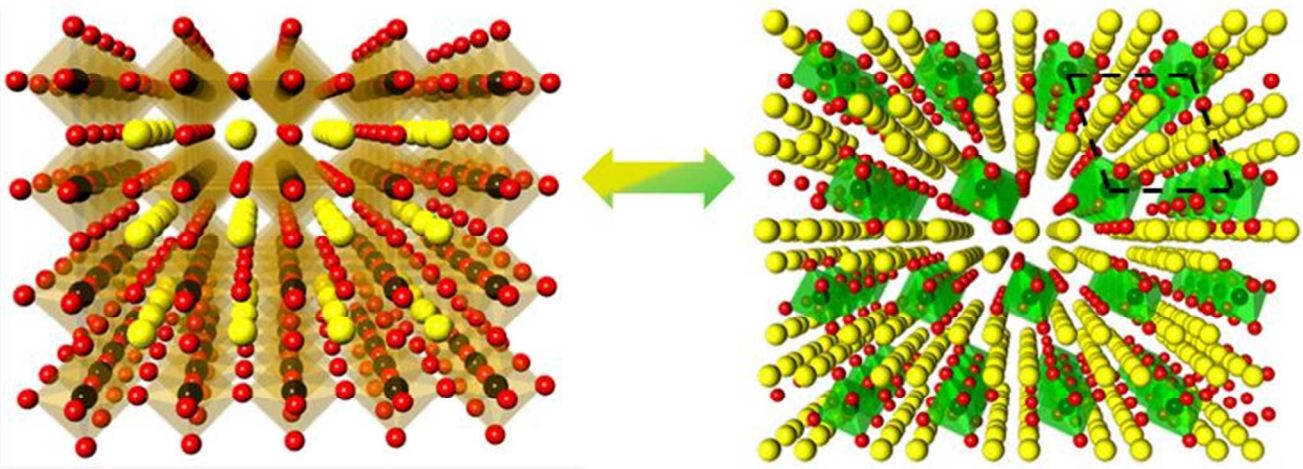

Figure S7. TGA spectra of $CsPbBr_3$ MCs, Cs_4PbBr_6 MCs, CsBr, and $PbBr_2$ measured from 30 to 1000 °C.

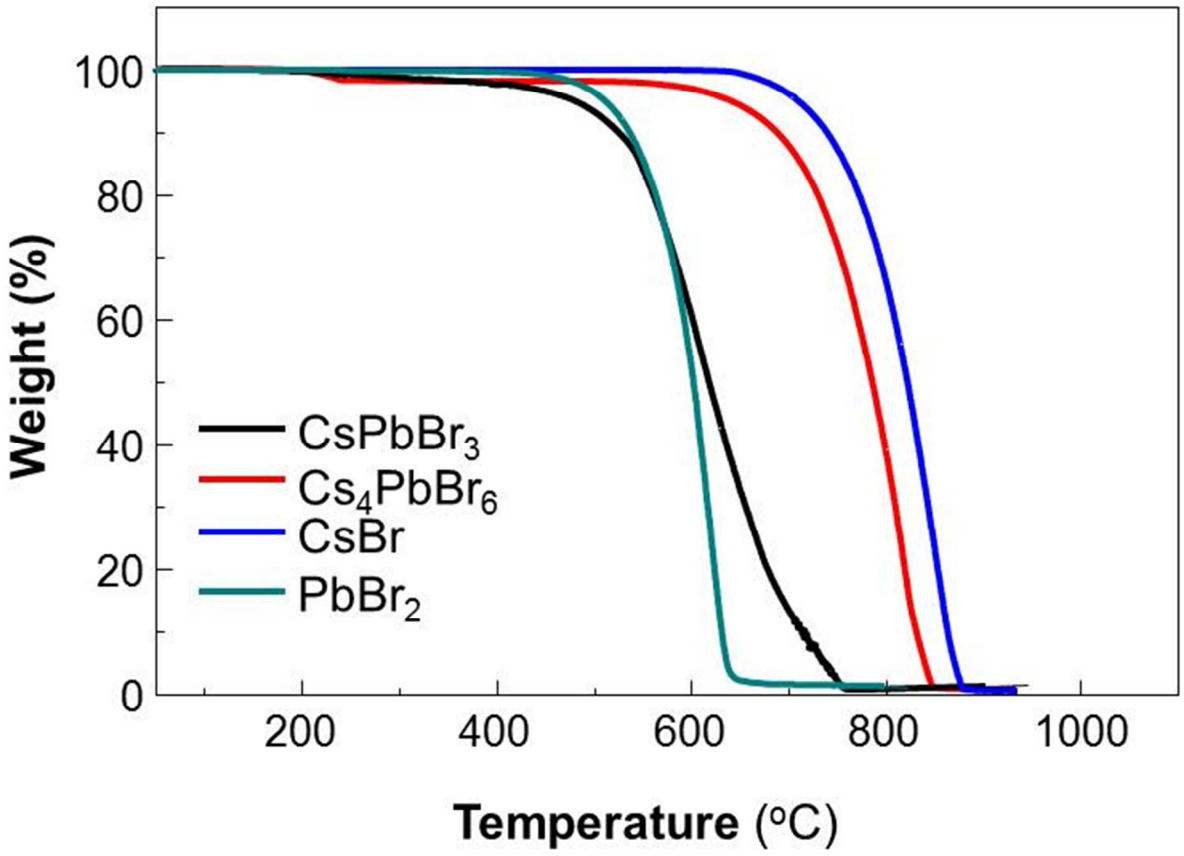

Figure S8. $CsPbBr_3$ QDs/PMMA, $CsPbBr_3$ MCs/PMMA, and Cs_4PbBr_6 MCs/PMMA films with different thickness on sapphire (a) under visible light and (b) under UV light. The dropping volume is fixed as 25, 50, 100, and 200 μL.

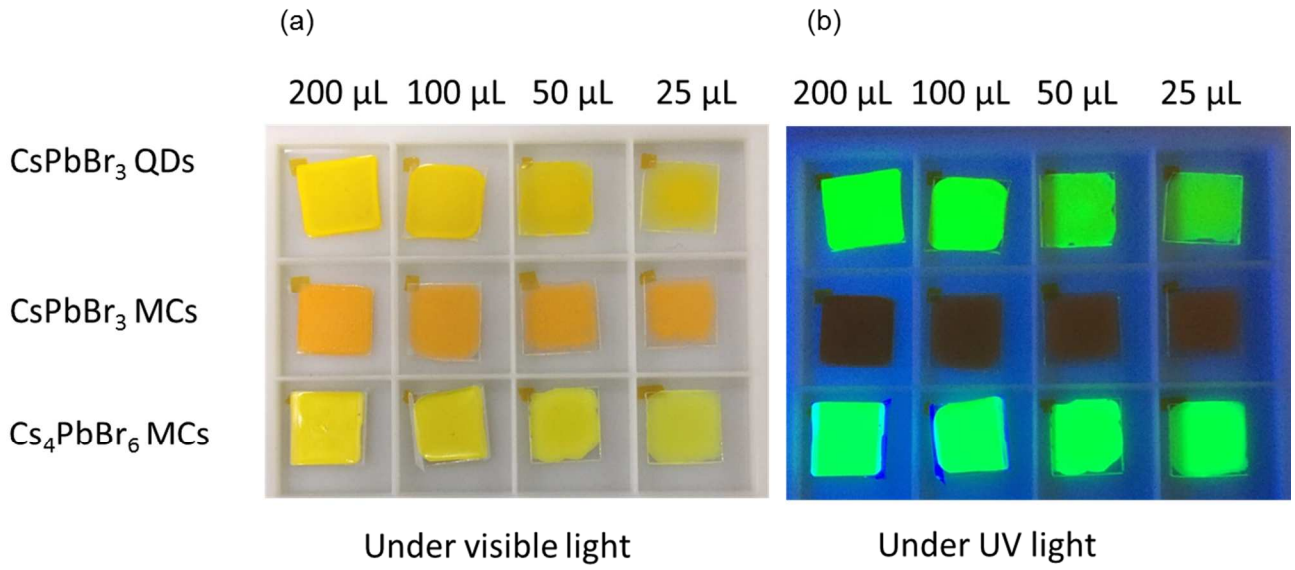

Figure S9. (a) The current-voltage curve and (b) electroluminescence spectrum of the UV-LED. (b) The maximum electroluminescence achieved at the wavelength of 265.5 nm.

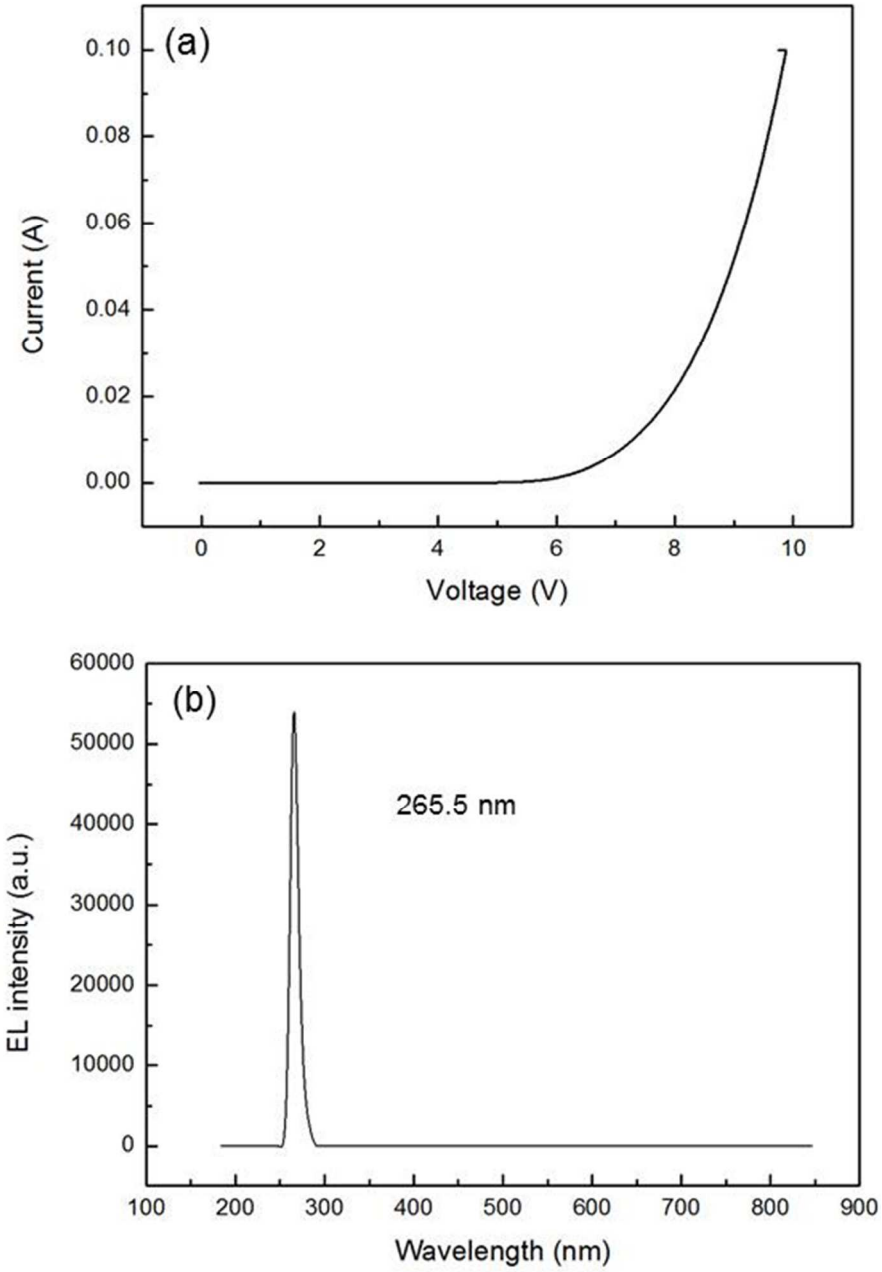

Figure S10. The commercial UV-LED (UVC LED 6868) on the chuck of the probe station (a) without a film and (b) with the Cs_4PbBr_6 MCs/PMMA film