Supporting Information:

Stable Quantum Dots/Polymer Matrix and Their Versatile 3D Printing Frameworks

Ruda Xu, Chen Qiao, Min Xia, Bing Bai, Yuemei Li, Jia Liu, Jiajia Liu, Hongpan Rong, Meng Xu, Jiatao Zhang1,2 *

1. Beijing Key Laboratory of Construction Tailorable Advanced Functional Materials and Green Applications, School of Materials Science and Engineering, Beijing Institute of Technology, Beijing 100081, China.

2. Key Laboratory of Medical Molecule Science and Pharmaceutics Engineering, MIIT, School of chemistry and chemical engineering, Beijing Institute of Technology, Beijing 100081, China

* Corresponding author

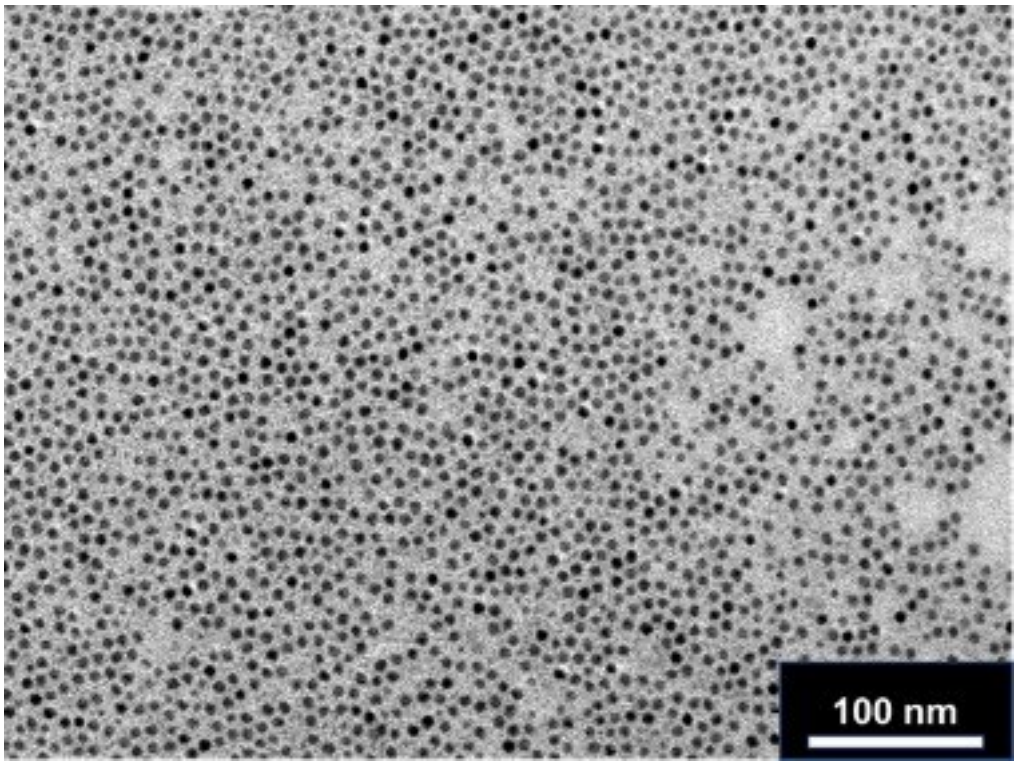

Figure S1. The TEM image of CdS:Ag@Sb_2O_3 QDs in toluene.

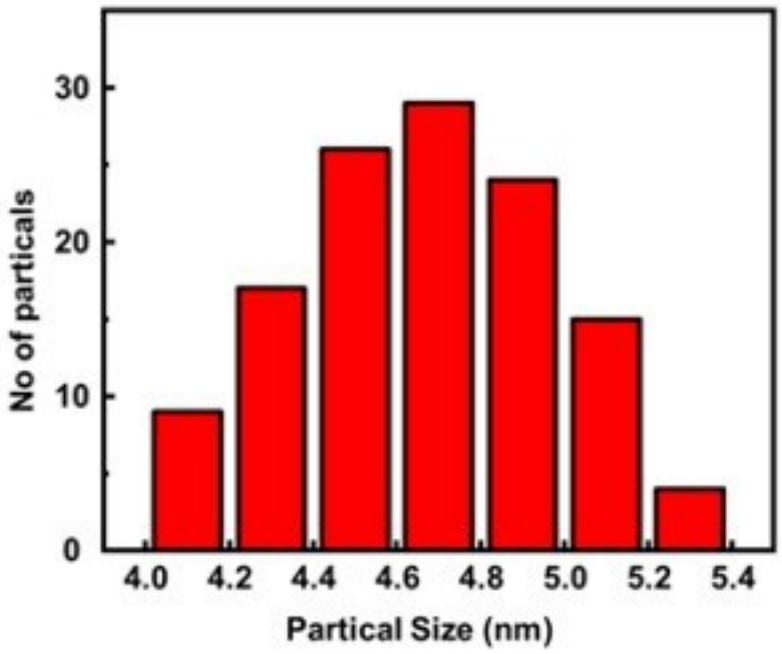

Figure S2. Partical size of CdS:Ag@Sb_2O_3 QDs calculated by Nano-measure.

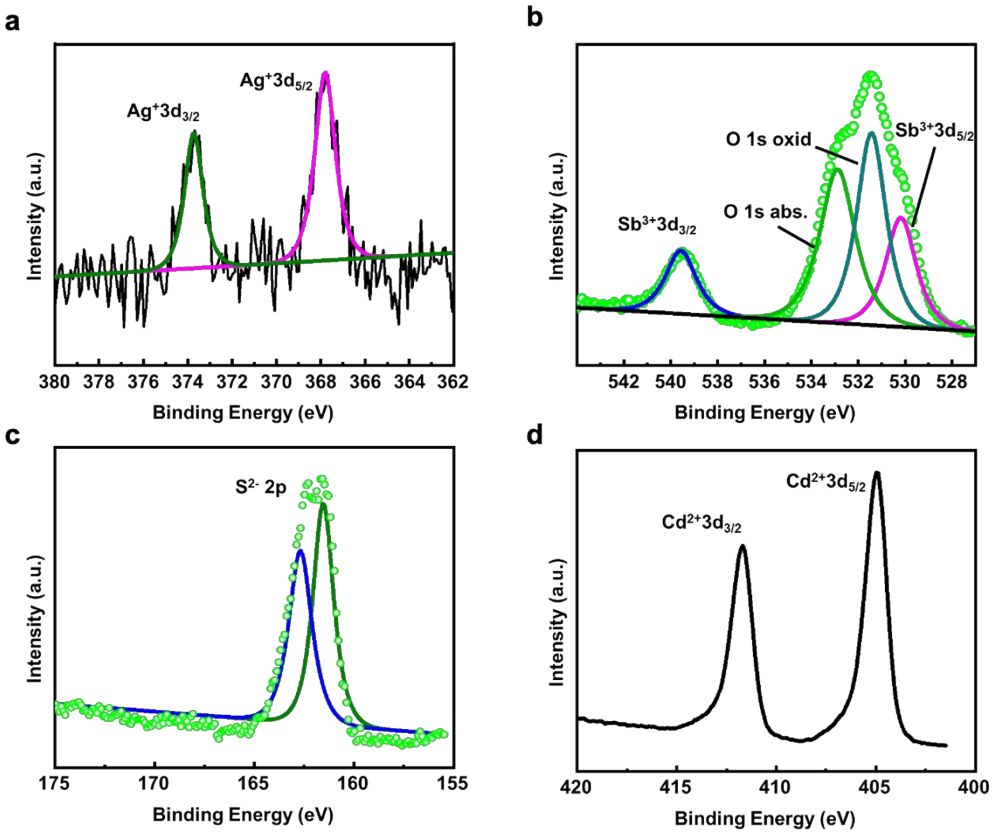

Figure S3 (a) High-resolution XPS spectrum of Ag 3d in as-prepared CdS:Ag@Sb_2O_3 QDs. (b) High-resolution XPS spectrum of Sb 3d in as-prepared CdS:Ag@Sb_2O_3 QDs. (c) High-resolution XPS spectrum of S 2p in as-prepared CdS:Ag@Sb_2O_3 QDs. (d) High-resolution XPS spectrum of Cd 3d in as-prepared CdS:Ag@Sb_2O_3 QDs.

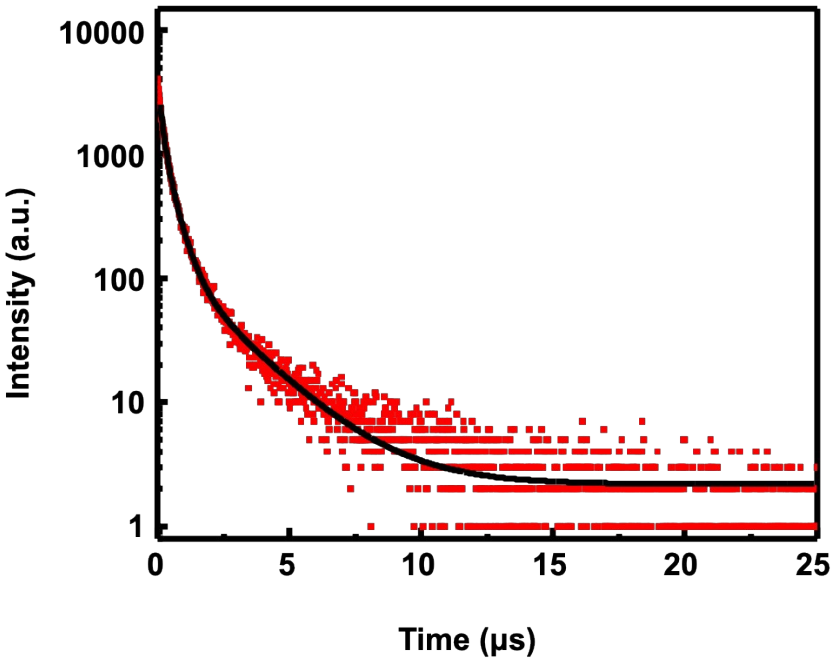

Figure S4. PL decay curve of CdS:Ag@Sb_2O_3 QDs measured at 687 nm using 3.1 eV excitation.

Table S1. Biexponential fit parameters and average emission lifetimes for the monitored wavelength.

$$I(t) = A_1 \exp\left(\frac{-t}{\tau_1}\right) + A_2 exp\left(\frac{-t}{\tau_2}\right)$$

Sample	τ_1 (μs)	A_1	τ_2 (μs)	A_2	τ_{av} (μs)
CdS:Ag@Sb_2O_3	1.22	66.60%	4.38	33.40%	1.69

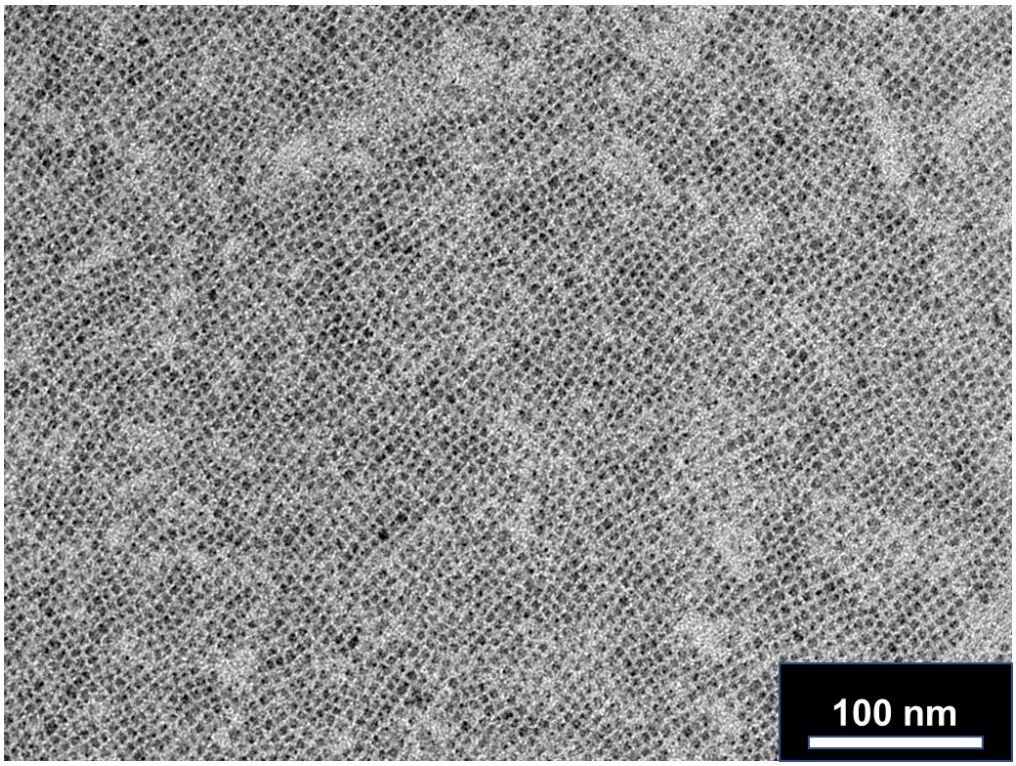

Figure S5. The TEM image of $CsPbBr_3$ perovskite QDs in toluene.

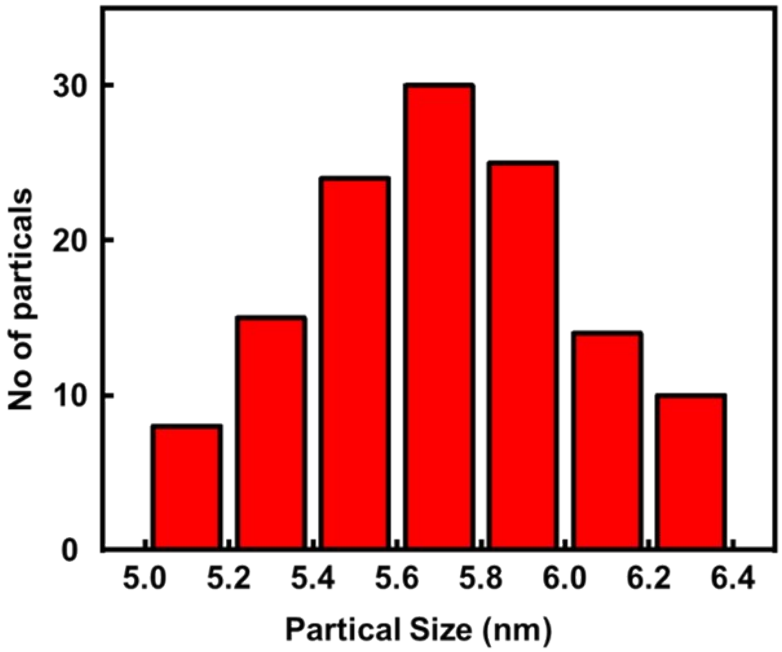

Figure S6. Partical size of $CsPbBr_3$ perovskite QDs calculated by Nano-measure.

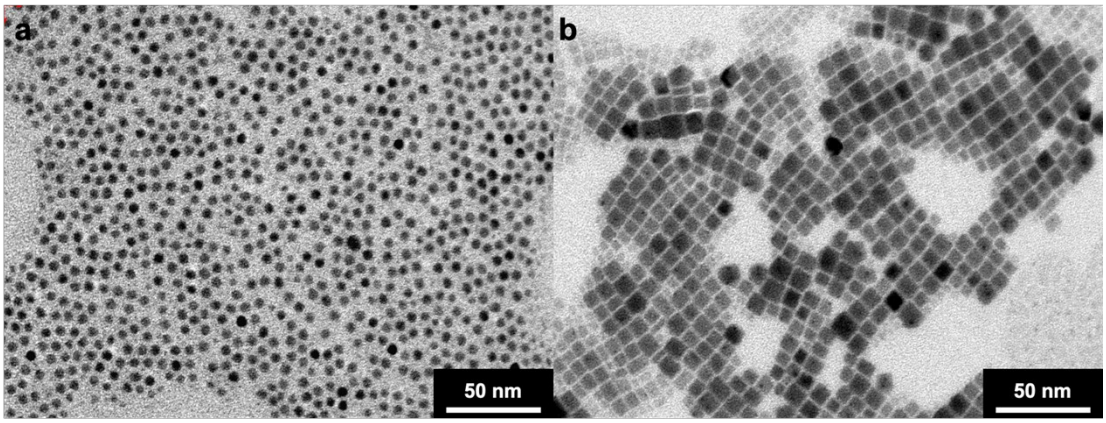

Figure S7 (a) TEM image of CdS:Ag@Sb_2O_3 in the polymer. (b) TEM image of $CsPbBr_3$ in the polymer.

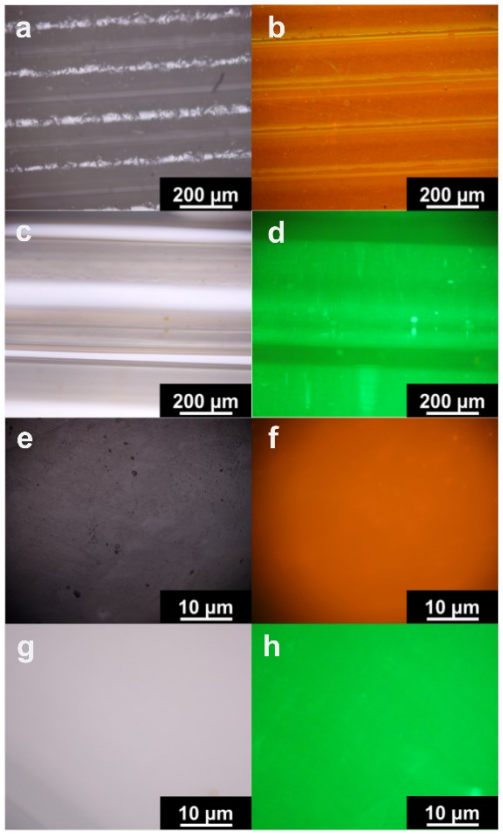

Figure S8 (a) Micro-fluorescence image of CdS:Ag@Sb_2O_3/PMMA under visible light at 200µm scale. (b) Micro-fluorescence image of CdS:Ag@Sb_2O_3/PMMA under UV light irradiation (430nm) at 200µm scale. (c)Micro-fluorescence image of $CsPbBr_3$/PMMA under visible light at 200µm scale. (d) Micro-fluorescence image of $CsPbBr_3$/PMMA under UV light irradiation (430nm) at 200µm scale. (e) Micro-fluorescence image of CdS:Ag@Sb_2O_3/PMMA under visible light at 10µm scale. (f) Micro-fluorescence image of CdS:Ag@Sb_2O_3/PMMA under UV light irradiation (430nm) at 10µm scale. (g)Micro-fluorescence image of $CsPbBr_3$/PMMA under visible light at 10µm scale. (h) Micro-fluorescence image of $CsPbBr_3$/PMMA under UV light irradiation (430nm) at 10µm scale.

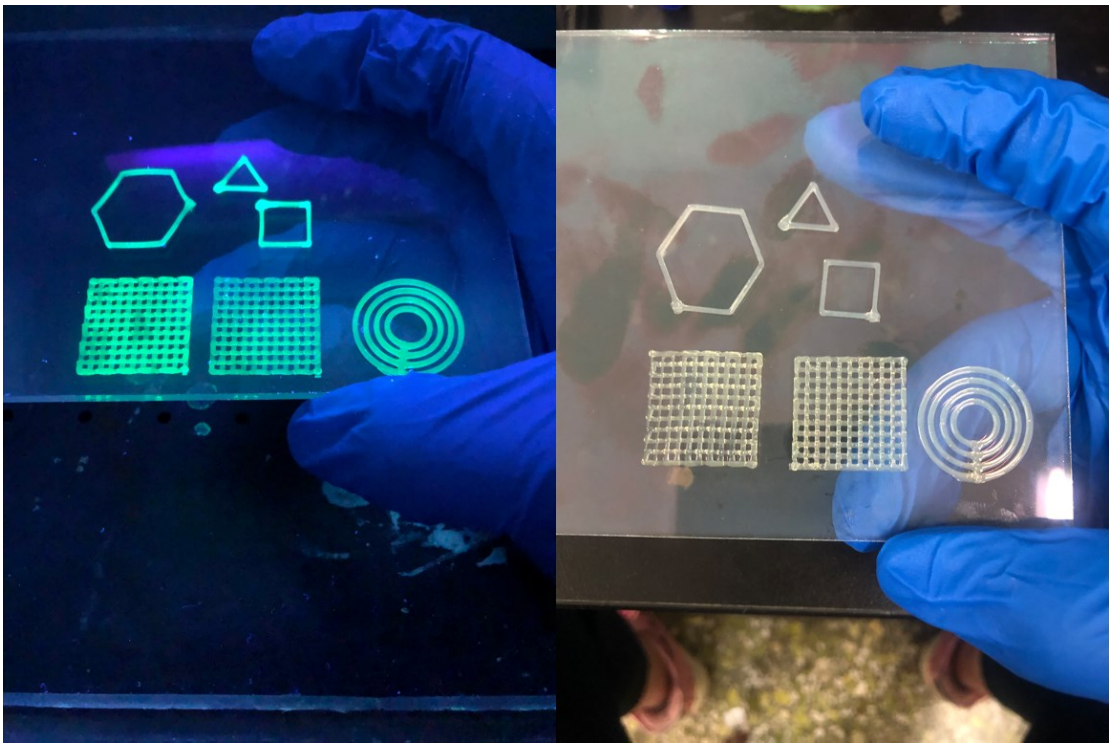

Figure S9 DIW printed $CsPbBr_3$ QDs / PMMA two-dimensional devices (grids, rings) photos comparison under UV and visible light.

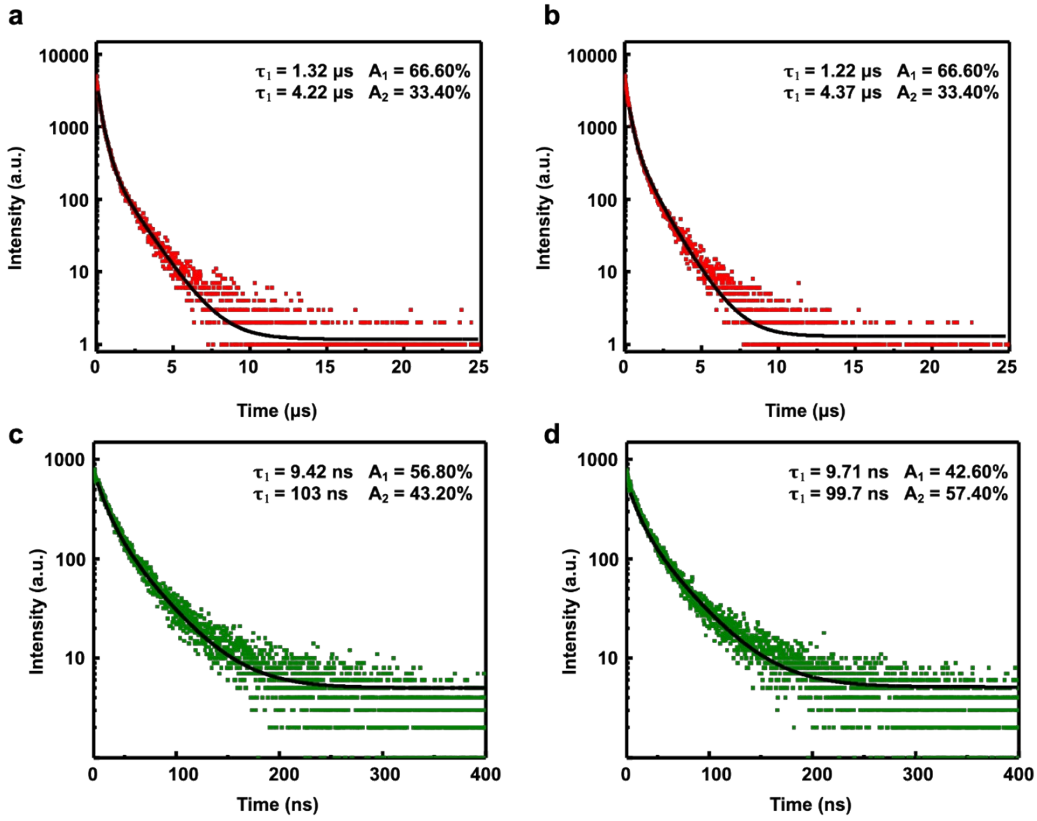

Figure S10 (a) PL decay curve of CdS:Ag@Sb_2O_3 QDs. (b) PL decay curve of CdS:Ag@Sb_2O_3 QDs/PMMA. (c) PL decay curve of $CsPbBr_3$ QDs. (d) PL decay curve of $CsPbBr_3$ QDs/PMMA.

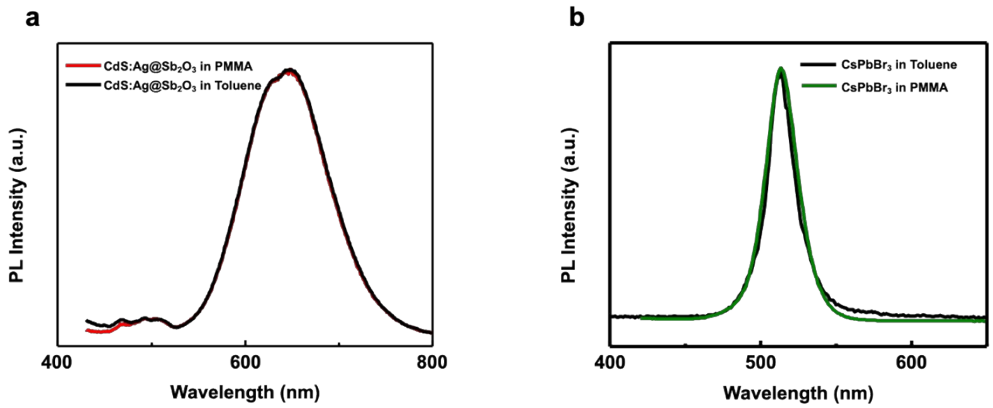

Figure S11 (a) The PL spectra of CdS:Ag@Sb_2O_3 QDs in PMMA matrix and CdS:Ag@Sb_2O_3 QDs in toluene. (b) The PL spectra of $CsPbBr_3$ QDs in PMMA matrix and $CsPbBr_3$ QDs in toluene.