Electronic supplementary information (ESI)

Fabrication of highly emissive and super stable perovskite nanocrystal-polymer slabs for luminescent solar concentrators

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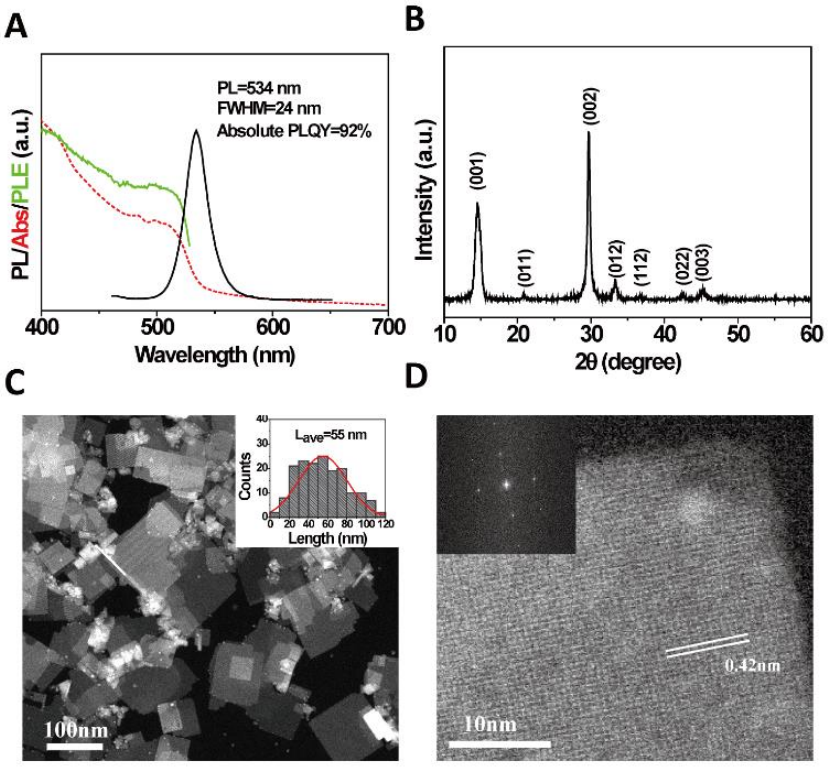

Figure S1. (A) Optical absorption (red line), PL excitation (green line) and PL emission (black line) spectra of the $FAPbBr_3$ NCs obtained by once centrifugation. (B) XRD pattern of the $FAPbBr_3$ NCs. (C, D) STEM-HAADF images of $FAPbBr_3$ NCs, the average edge length is 55 nm. The inset in (D) shows the corresponding size distribution histogram. The inset in (G) shows the corresponding indexed FFT image.

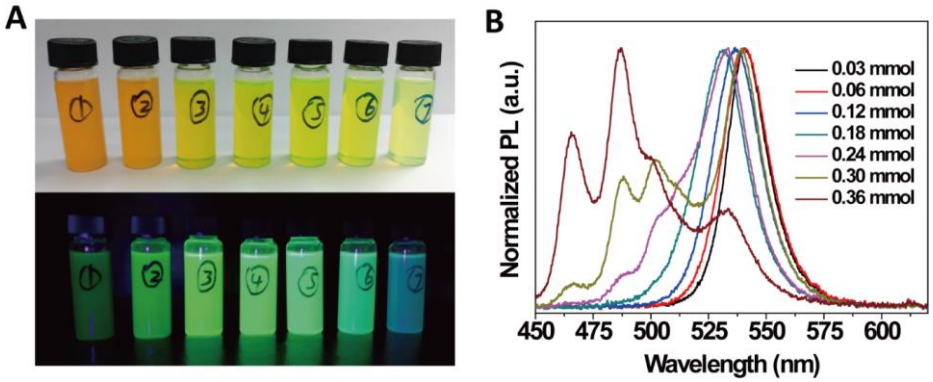

Figure S2. (A) Photographs of $FAPbBr_3$ NCs solution samples under room light (up) and under 365nm UV light (down) synthesized with different amount of OTAm, from left to right: 0.03 mmol; 0.06 mmol; 0.12 mmol; 0.18 mmol; 0.24 mmol; 0.30 mmol; 0.36 mmol. (B) Normalized PL emission spectra of different $FAPbBr_3$ NCs solution samples synthesized with different amount of OTAm as the capping ligand with the PL emission peak at 542 nm (0.03 mmol), 541 nm (0.06 mmol), 537 nm (0.12 mmol) and 532 nm (0.18 mmol). For OTAm of 0.24, 0.30 and 0.36 mmol, the resulting PL spectra display multiple peaks.

Table S2. PL emission peak, FWHM, absolute PLQY of the $FAPbBr_3$ NCs as a function of different amount of OTAm.

The amount of OTAm	**PL (nm)**	**FWHM (nm)**	**PLQY**
0.03 mmol	542 nm	21 nm	37%
0.06 mmol	541 nm	22 nm	69%
0.12 mmol	537 nm	23 nm	84%
0.18 mmol	532 nm	23 nm	95%

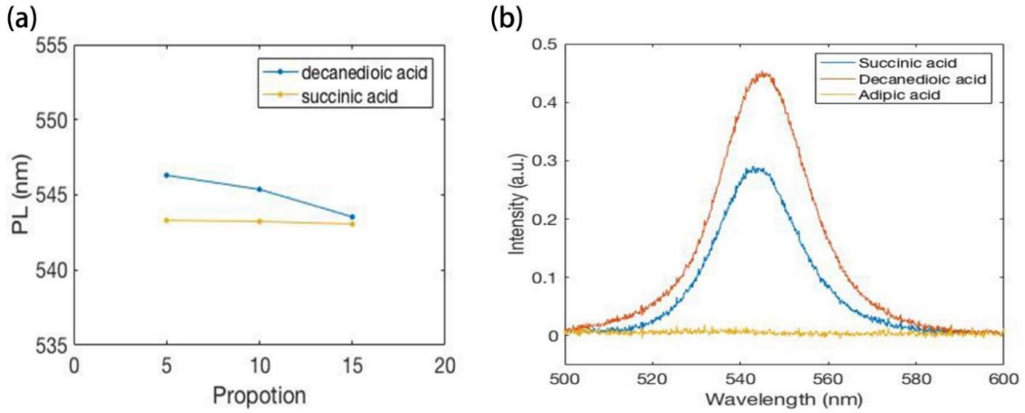

Figure S3. (A) The PL emission peaks of the NCs synthesized by decanedioic acid (containing 10 carbon atoms) and succinic acid (containing 4 carbon atoms) with different toluene/precursors ratios. (B) PL emission spectra of the NCs synthesized using decanedioic acid, adipic acid (containing 6 carbon atoms), and succinic acid, respectively.

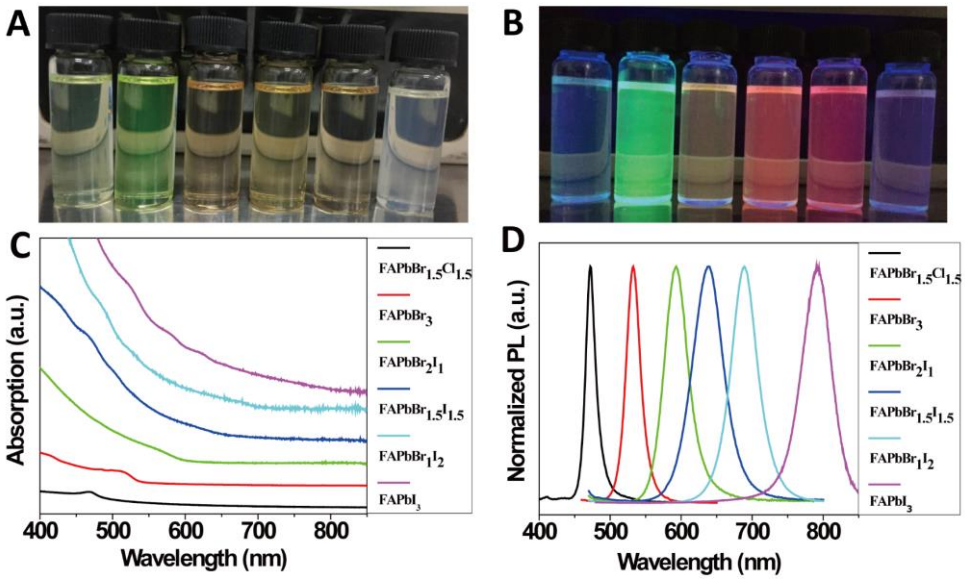

Figure S4. (A and B) Photographs a series of $FAPbX_3$ samples synthesized at room temperature under room light (A) and under 365nm UV light (B), from left to right: $FAPbBr_{1.5}Cl_{1.5}$; $FAPbBr_3$; $FAPbBr_2I_1$; $FAPbBr_{1.5}I_{1.5}$; $FAPbBr_1I_2$; $FAPbI_3$. (B and C) Optical absorption and PL emission spectra of the as-synthesized $FAPbX_3$ NCs solutions (black line, $FAPbBr_{1.5}Cl_{1.5}$; red line, $FAPbBr_3$; green line, $FAPbBr_2I_1$; blue line, $FAPbBr_{1.5}I_{1.5}$; cyan line $FAPbBr_1I_2$; magenta line, $FAPbI_3$) with emission peaks at 472, 532, 593, 639, 689 and 790 nm respectively. All samples were prepared in air at room temperature