

Supporting information

Inkjet Printed Patterned Bank Structure with Encapsulated Perovskite Colour Filters for Modern Display

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1. Performance of ink system: Mixing LCM with OLA/OA-capped perovskite nanocrystals, a severe aggregation happened in their mixing solution which prevents the printing process (Figure S1(a)). However, HPA-capped CsPbBr₃ and LCM mixed solution were still clear under a relatively high concentration of 10 mg/mL (Figure S1(b)), showing that it has stronger binding ligands which leads to a better dispersion. The effective attachment of LCM to the surface ligands of HPA-CsPbBr₃ is one of the reasons to avoid severe aggregation.

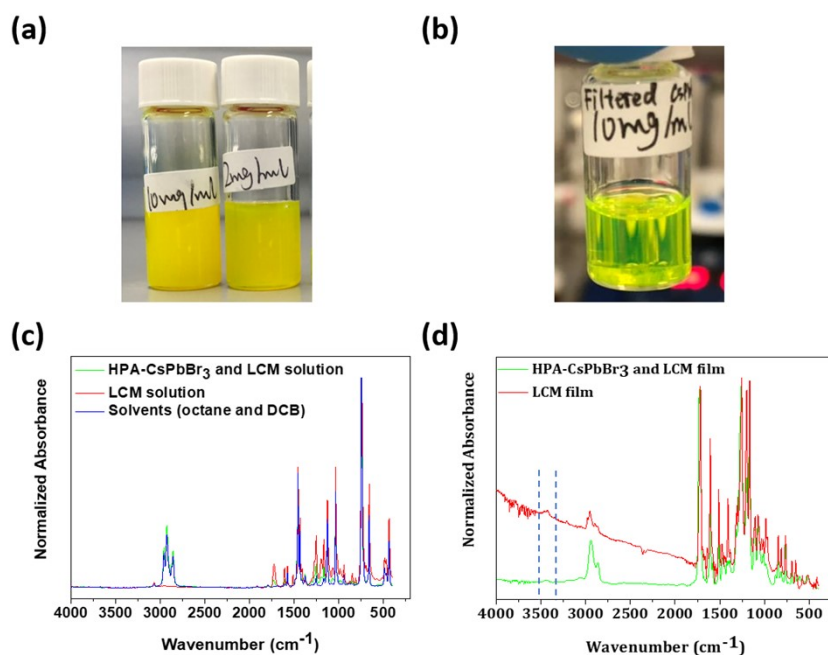


Figure S1. (a) Pictures of 10 mg/mL and 2 mg/mL OA-CsPbBr₃ after mixing with LCM solution (b) Picture of 10 mg/mL HPA-CsPbBr₃ after mixing with LCM solution. (c) FTIR of HPA-CsPbBr₃ and LCM in solution phase. (d) FTIR of HPA-CsPbBr₃ and LCM in solid phase.

2. Summary of optical properties of CsPbBr₃ and CsPbBr_{1.2} nanocrystals

	Green perovskite	Red perovskite
Solution PLQY (ex 450nm)	90%	70%
Film PLQY (ex 450nm)	53%	27%
Photoluminescence/nm	513	630
FWHM /nm	20	32

3. Modified inkjet printer waveform for the low viscosity ink used for green and red ink composition printing: By

applying a multistep negative section in the waveform instead of the continuous slope, so that the end face of the liquid thread remained in contact with nozzles and flew back during the negative section. It has been found that the negative slope with 15 steps offers the optimal jetting for all the chosen ink formulations with an inverse Ohnesorge number larger than 14. (without any satellite drops)[1]

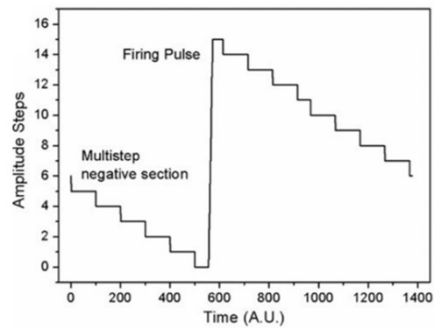


Figure S2 : Waveform of negative slope with 15 steps used in printing

Reference:

- [1] S. K. Gupta et al., "Inkjet-printed aligned quantum rod enhancement films for their application in liquid crystal displays," (in English), *Nanoscale*, vol. 11, no. 43, pp. 20837-20846, Nov 21 2019.