# Supporting Information

## Luminescent nanofluids of organometal halide perovskite nanocrystals in silicone oils with ultrastability

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## 1. GdN LED colour conversion

A blue GdN LED chip (0.6 watt) with the emission peak at 455 nm was immersed into 4 mL $MAPbBr_3$ or $MAPbI_3$ nanofluid in a 5 mL beaker. It was connected with wires and power source. When power on, the liquid emitted its fluorescent light and the blue emitted light of the LED chip was completely transformed to green or red emission.

## 2. XRD measurements

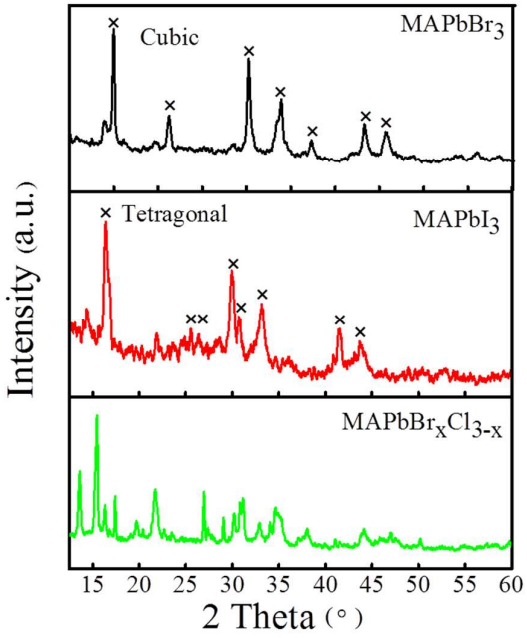


Figure S1.The PXRD patterns of $MAPbBr_3$, $MAPbBr_{3-x}Cl_x$ and $MaPbI_3$ NCs.

## 3. Stability investigation of $MAPbBr_3$ NCs

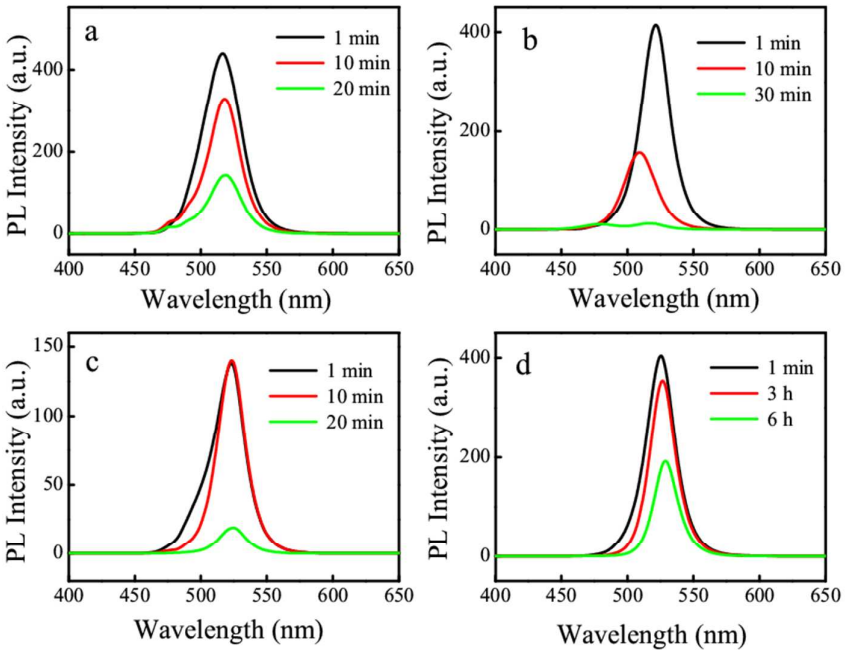


Figure S2. Evaluation of PL spectra of the $MAPbBr_3$ NCs dispersed in other organic solvents in the existence of water. (a) PhCl; (b) $CCl_4$; (c) n-hexane; (d) 1-octadecene.

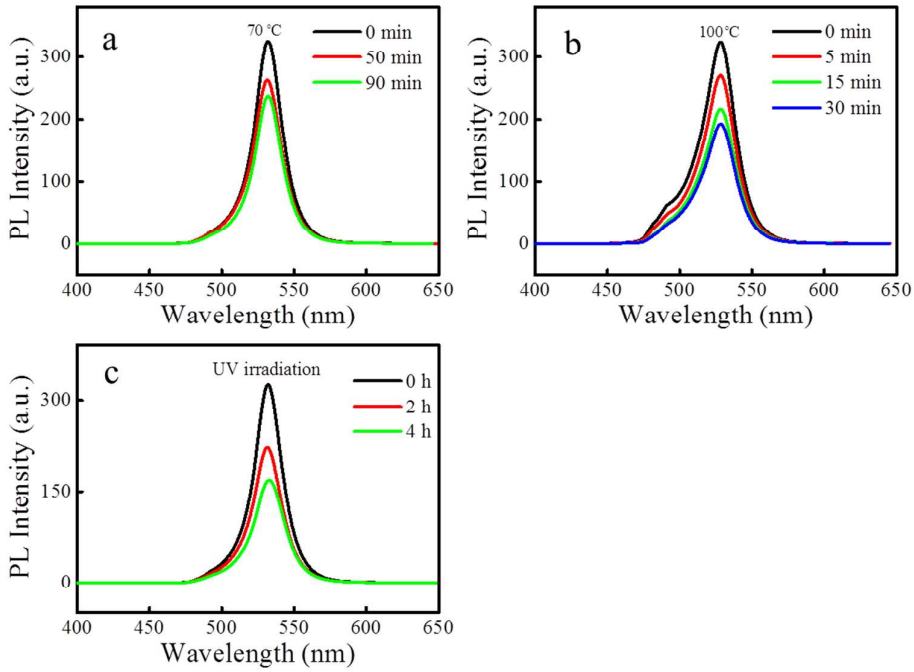

Figure S3. Evaluation of PL spectra of the $MAPbBr_3$ NCs dispersed in toluene. (a) Curing at 70 ˚C; (b) Curing at 100 ˚C; (c) Exposure to UV light irradiation.

**4. The measurement of photoluminescence quantum yield**

The calculation of the relative quantum yield.[1-3] Absolute values are calculated using the standard samples, and their quantum yield are fixed and known, according to the following equation:

$$Q_X=Q_{ST}\,(K_X/K_{ST})\,(\eta_X^2/\eta_{ST}^2)$$

Where the subscripts ST and X denote standard (Coumarin-6 or Rhodamine B, in ethanol) and sample (perovskite NCs, in silicone oils and toluene) respectively. Q is the fluorescence quantum yield. The fluorescence quantum yield of Coumarin-6 is 77 %, and Rhodamine B is 89%. K is the gradient from the plot of integrated fluorescence intensity vs absorbance, and η is the refractive index of the solvent.

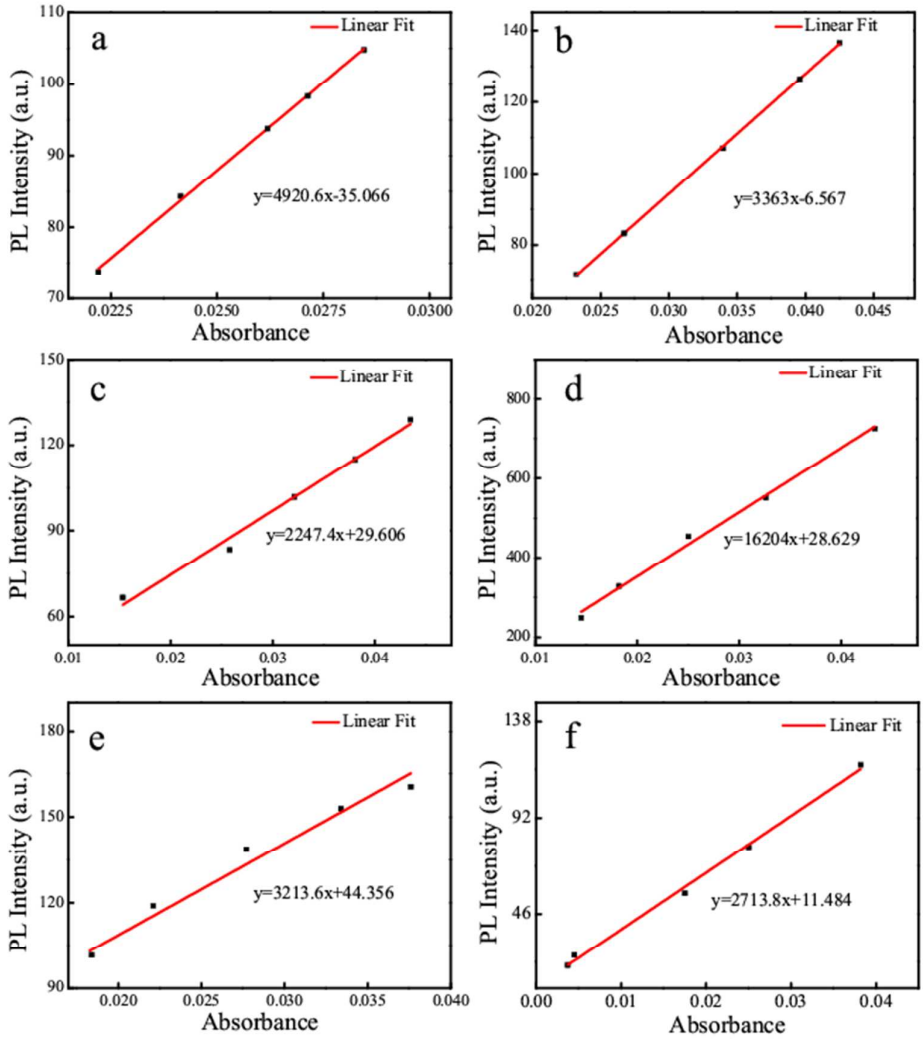


Figure S4. The fitting curves of integrated PL intensity vs absorbance. (a) Coumarin-6 in ethanol (QY: 0.77). (b) $MAPbBr_3$ NCs in DMS (500 mPa·s). (c) $MAPbBr_{3-x}Cl_x$ in DMS (500 mPa·s). (d) Rhodamine B in ethanol (QY: 0.89). (e) $MAPbI_3$ in DMS (500 mPa·s). (f) $MAPbBr_3$ in toluene.

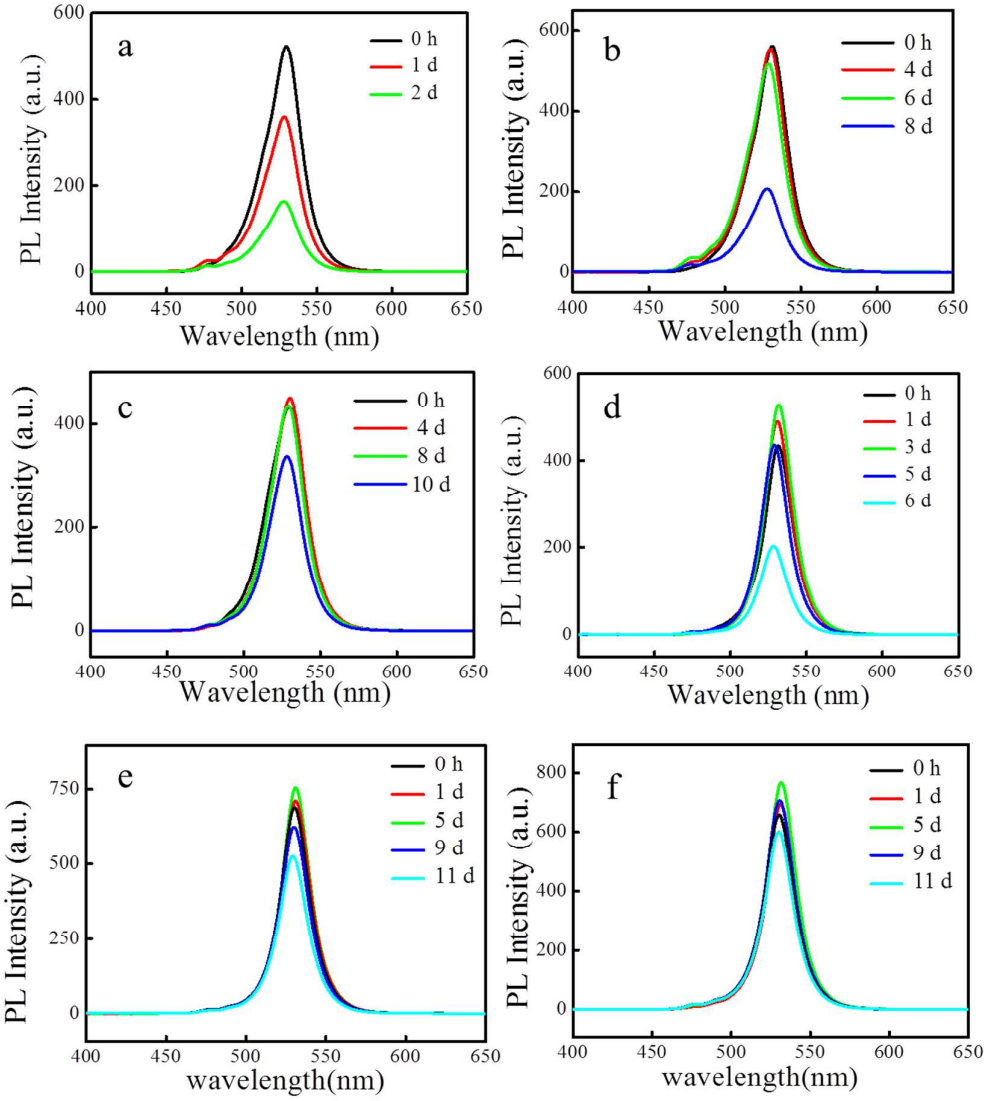


Figure S5. Evaluation of PL spectra of the $MAPbBr_3$ NCs dispersed in other silicon oils in the existence of water. (a) 50, (b) 100 and (c) 1000 mPa·s in DSM. (d) 100, (e) 500 and (f) 1000 mPa·s in VS.

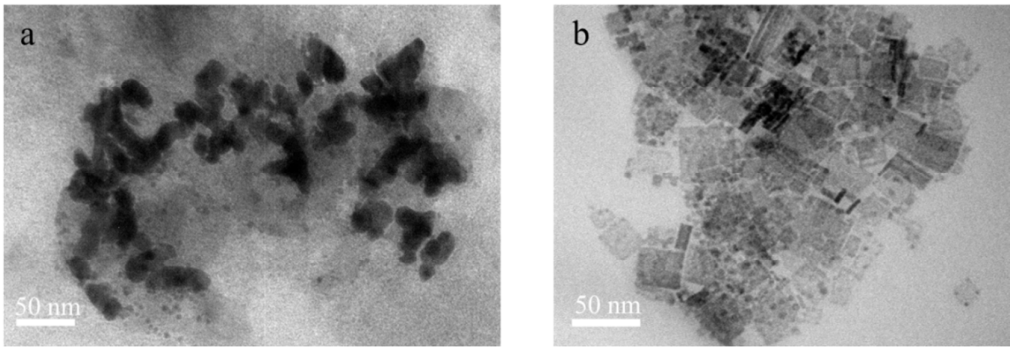


Figure S6.The TEM images of (a) $MAPbI_3$ and (b) $MAPbBr_{3-x}Cl_x$ NCs.

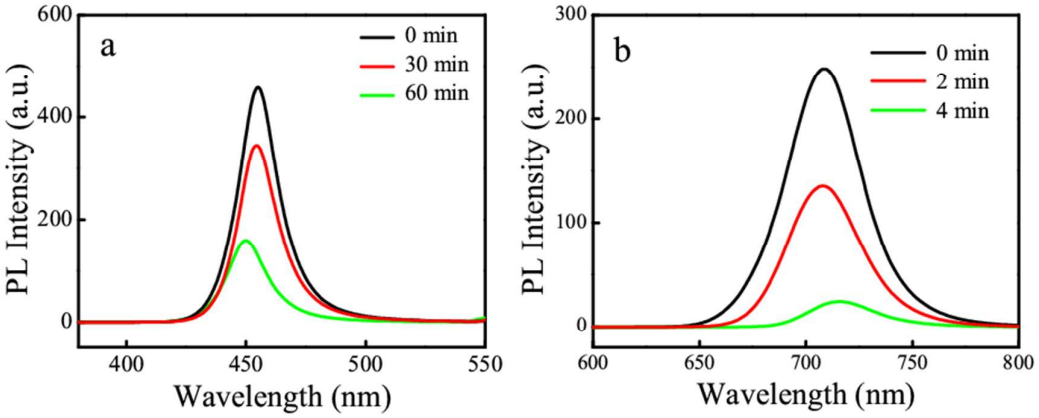


Figure S7. Evaluation of PL spectra of the (a) $MAPbBr_{3-x}Cl_x$ (b) $MAPbI_3$ dispersed in toluene after the addition of water.

REFERENCES

(1) Herz, E.; Marchincin, T.; Connelly, L.; Bonner, D.; Burns, A.; Switalski, S.; Wiesner, U., Relative quantum yield measurements of coumarin encapsulated in core-shell silica nanoparticles. *Journal of fluorescence* **2010**, *20*, 67-72.

(2) Lakowicz, J. R., Principles of Fluorescence Spectroscopy, Kluwer Academic/Plenum Press, New York, 1999, Second Edition.

(3) Scaiano, J. C., Handbook of Organic Photochemistry, CRC Press, 1989.