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# Photo-Induced Black Phase Stabilization of $CsPbI_3$ QDs Films

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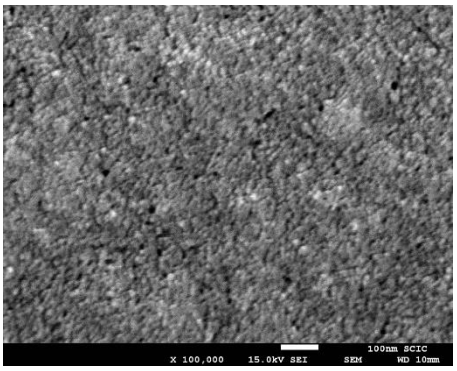


**Figure S1.** Top view SEM image of the $CsPbI_3$ QDs 3 layer film with higher magnification.

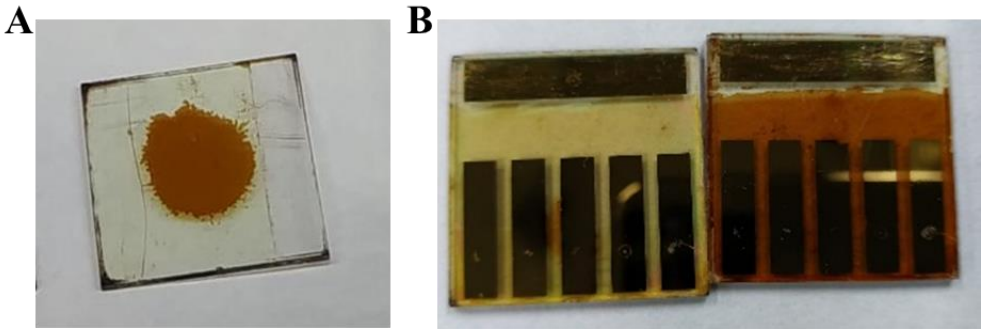


**Figure S2.** (**a**) Picture of accidental detachment of photoactive layer after EtOAc washing in a device with 1 min UV treatment. (**b**) Pictures of the solar cells after air exposure, left EtOAc and right UV treated device.

**Table S1.** Photovoltaic parameters extracted from J–Vs scans, best device of each variation.

| Variation | Jsc (mA/cm²) | $V_{oc}$ (V) | FF (%) | PCE (%) |
|---|---|---|---|---|
| EtOAc 3 layers | 8.2 | 0.992 | 70.5 | 5.8 |
| EtOAc 5 layers | 9.6 | 1.011 | 63.6 | 6.2 |
| UV 2 min 3 layers | 10.4 | 1.031 | 69.0 | 7.4 |
| UV 2 min 5 layers | 8.3 | 1.041 | 60.2 | 5.2 |
| UV 4 min 3 layers | 8.2 | 0.982 | 70.9 | 5.7 |

**Table S2.** Time resolved PL decay fitting parameters with a biexponential function.

| Sample | $\tau_1$ (ns) | $B_1$ (%) | $\tau_2$ (ns) | $B_2$ (%) | $\tau_{ave}$ (ns) |
|---|---|---|---|---|---|
| $CsPbI_3$-EtOAc | 15.5 | 8.4 | 0.65 | 91.6 | 1.9 |
| $CsPbI_3$-UV | 25.0 | 46 | 0.57 | 54 | 11.8 |