

Supplementary Information

One-Step Solution-Processed Formamidinium Lead Trihalide ($FAPbI_{3-x}Cl_x$) for Mesoscopic Perovskite-Polymer Solar Cells

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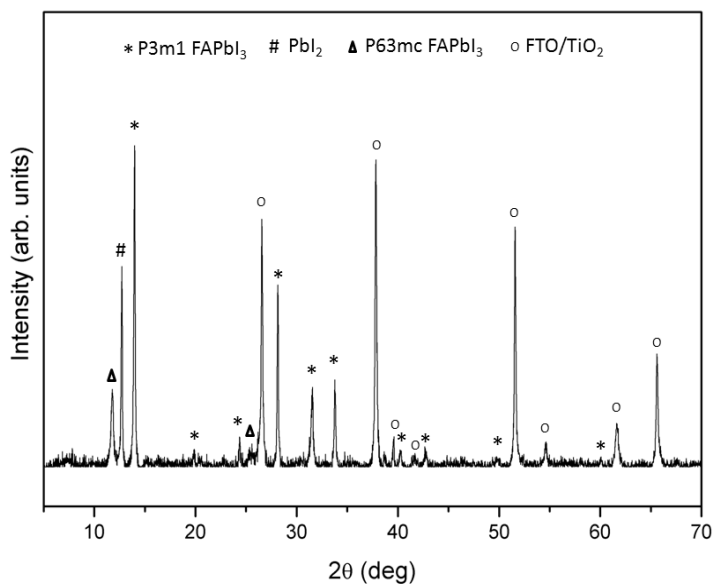


Figure S1. XRD pattern of the reference $FAPbI_3$ layer prepared from a mixture of PbI_2 and FAl in 1:1 molar ratio 1:1, on mesoporous TiO_2 , heat-treated at 160 °C for 30 min.

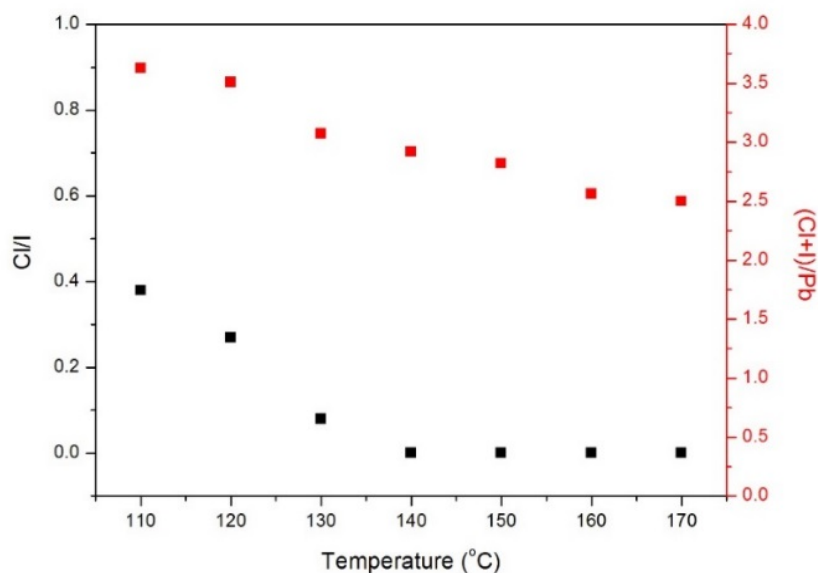


Figure S2. The mole ratios of Cl/I and (Cl+I)/Pb as function of annealing temperature (30 min) in as-prepared perovskite films upon mesoporous TiO₂ based on EDS elemental analysis. It is clear that the amount of the Cl gradually decreases with increasing heat-treatment temperature. When the perovskite film was heated at 110 °C for 30 min, the amount of Cl is similar to its initial content (Cl/I mole ratio 0.4), indicating that significant evaporation /sublimation of *FACl* occurs at 110 °C to 120 °C.

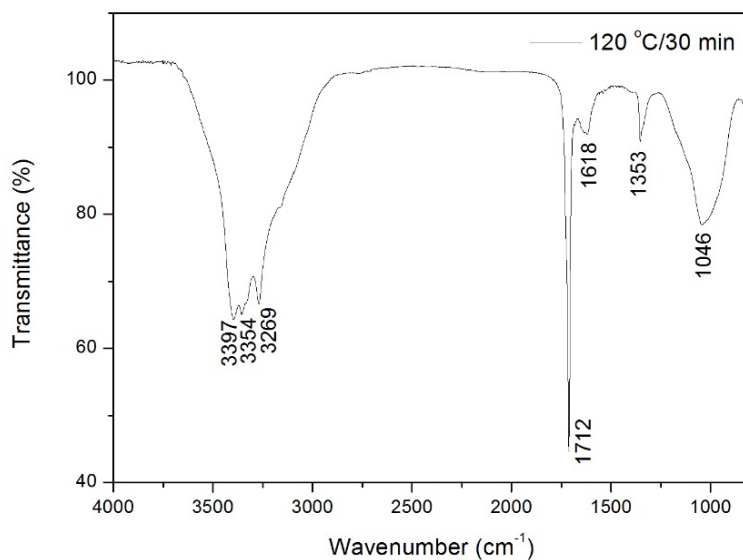


Figure S3. FTIR spectrum of the perovskite film heated at 120 °C for 30 min. The absorbance at 1712 cm⁻¹ is attributed to the C=O stretching vibration, indicating the presence of DMF.



Figure S4. Optical photographs of $FAPbI_{(3-x)}Cl_x$ layers, on mesoporous TiO_2 , heat-treated at 120 °C to 170 °C (30 min).

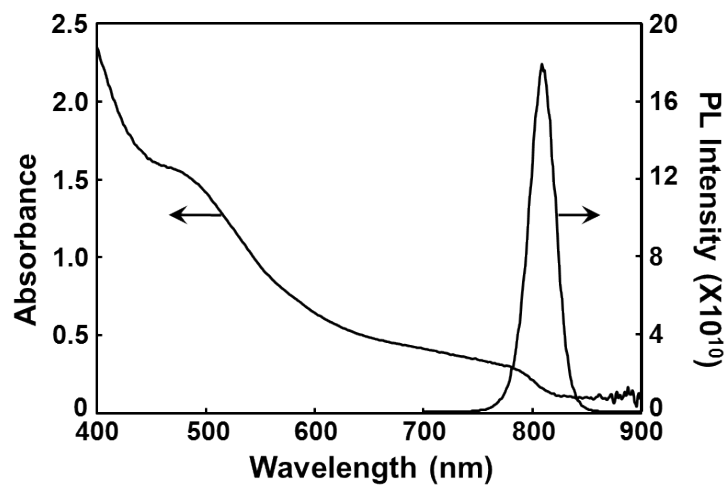


Figure S5. UV-*vis*-NIR optical absorption spectrum and photoluminescence (PL) emission spectrum from $FAPbI_{(3-x)}Cl_x$ perovskite layer (140 °C heat-treatment, 30 min).