

Electronic Supplementary Information

Enhancing the Efficiency and Stability of Inverted Perovskite Solar Cells by Using 6-(trifluoromethyl)nicotinic Acid as Potent Defect Passivator

Deepak Yadav^a, Ramkrishna Das Adhikari^b, Himangshu Baishya^b, Mayur Jagdishbhai Patel^a, and
Parameswar Krishnan Iyer^{*a,b}

^aDepartment of Chemistry, Indian Institute of Technology Guwahati, Guwahati-781039,
Assam, India

^bCentre for Nanotechnology, Indian Institute of Technology Guwahati, Guwahati-781039,
Assam, India.

*Email: pki@iitg.ac.in

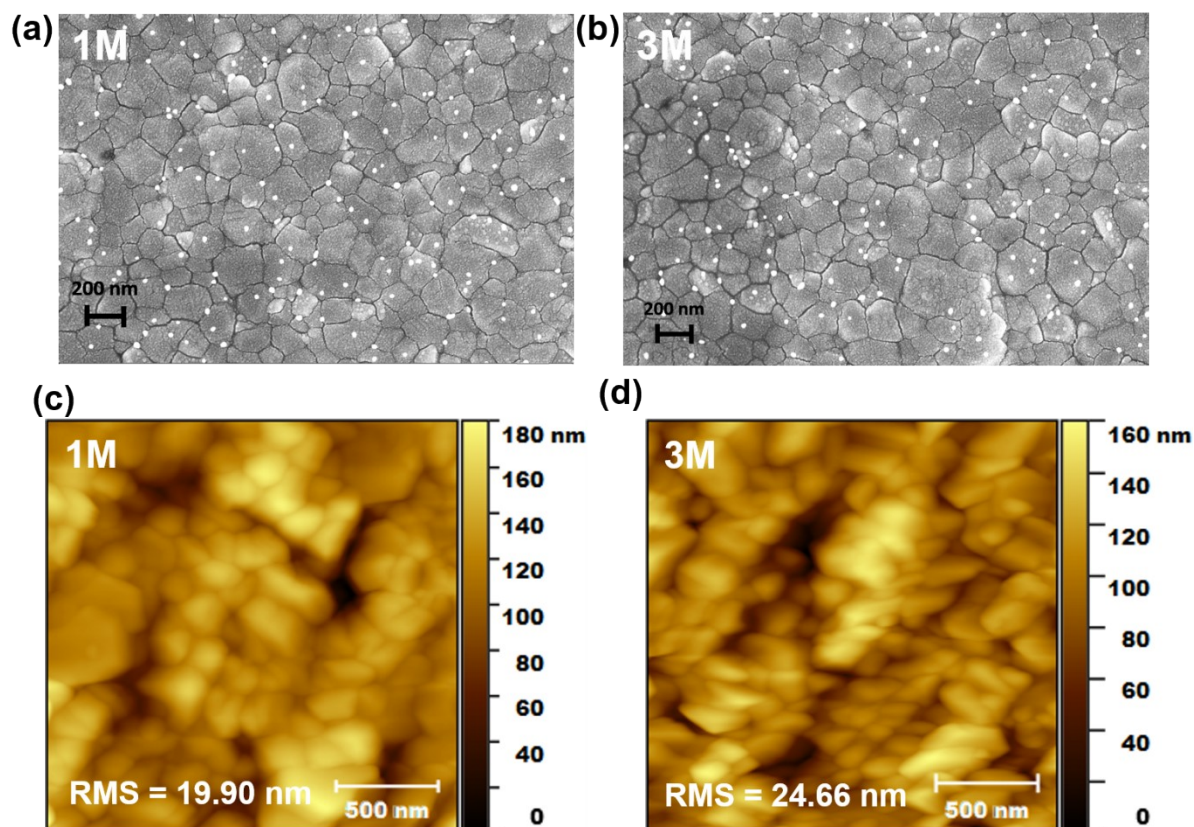


Fig. S1: (a, b) SEM and (c, d) AFM micrograph of 1M and 3M modified perovskite film.

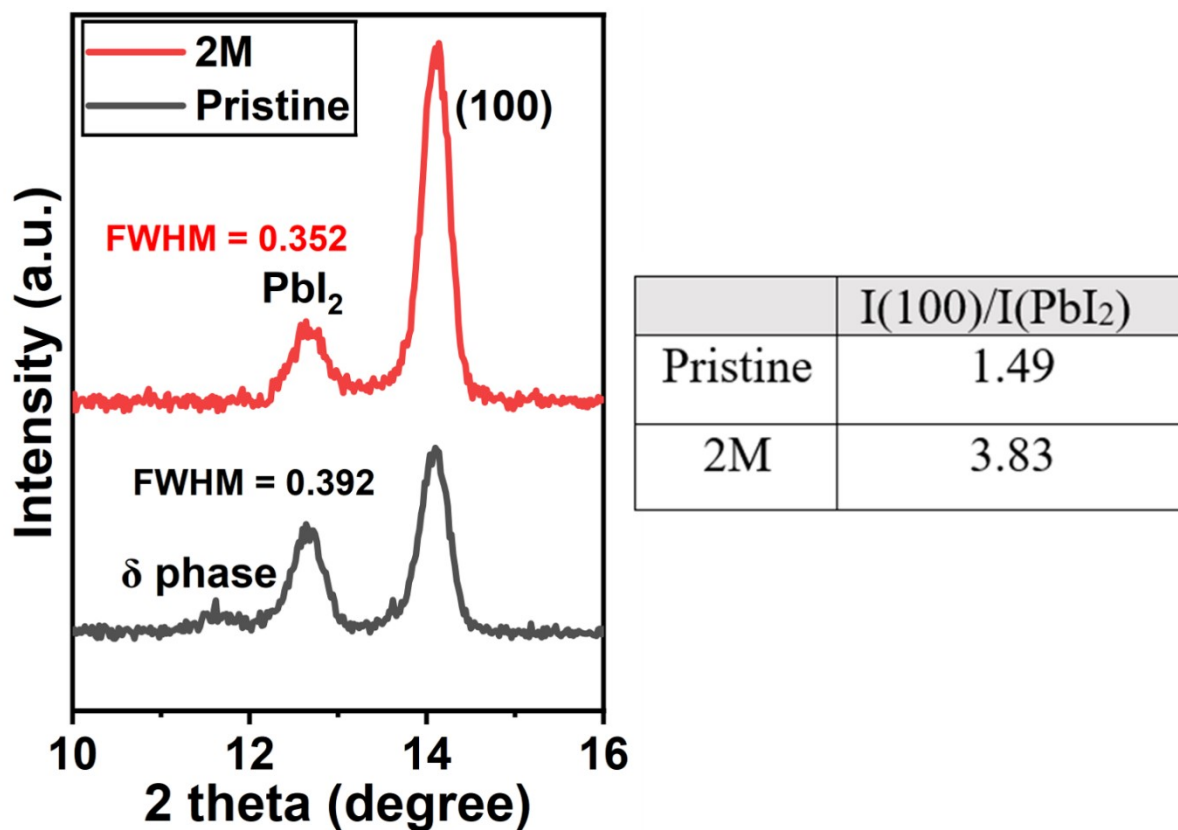


Fig. S2: FWHM and I(100)/I(PbI_2) ration value of the pristine and 2M perovskite film respectively.

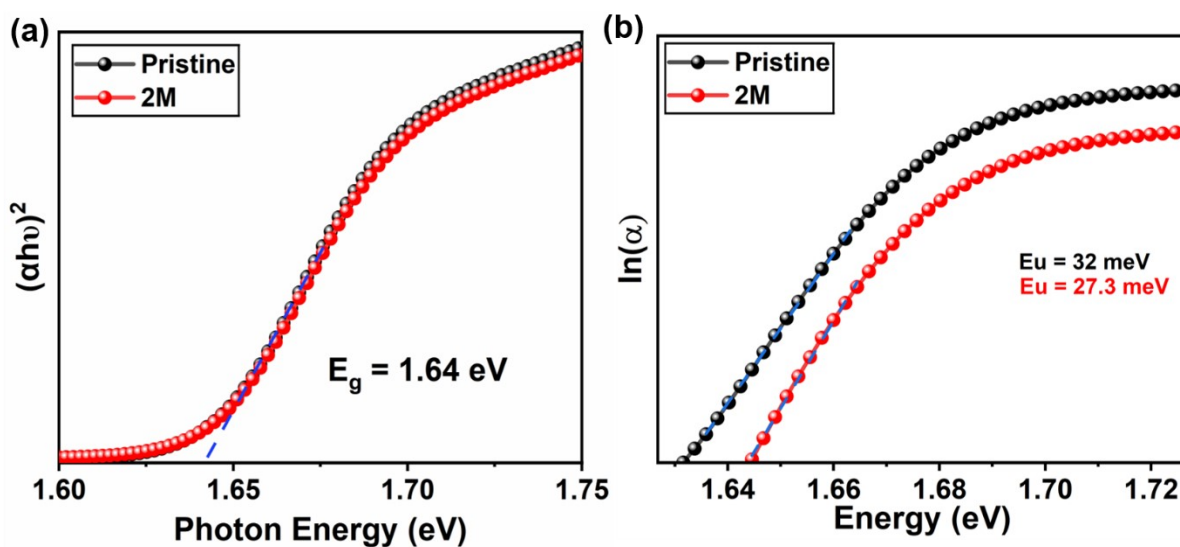


Fig. S3: (a) Tauc plot and (b) Urbach tail energy of the pristine and 2M perovskite film.

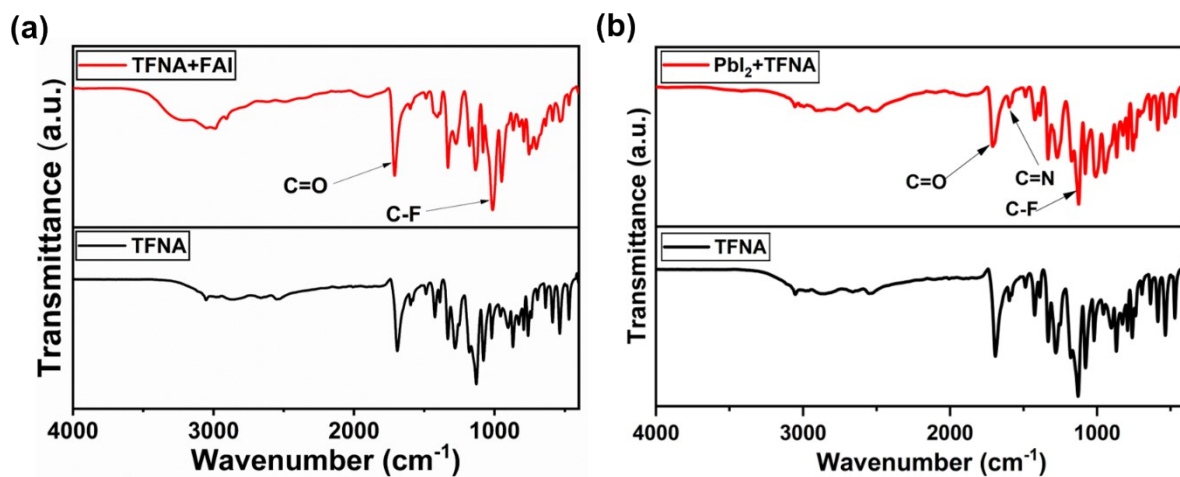


Fig. S4: Full range FTIR spectra of the additive molecule and its mixture with (a) FAI and (b) PbI_2 precursors.

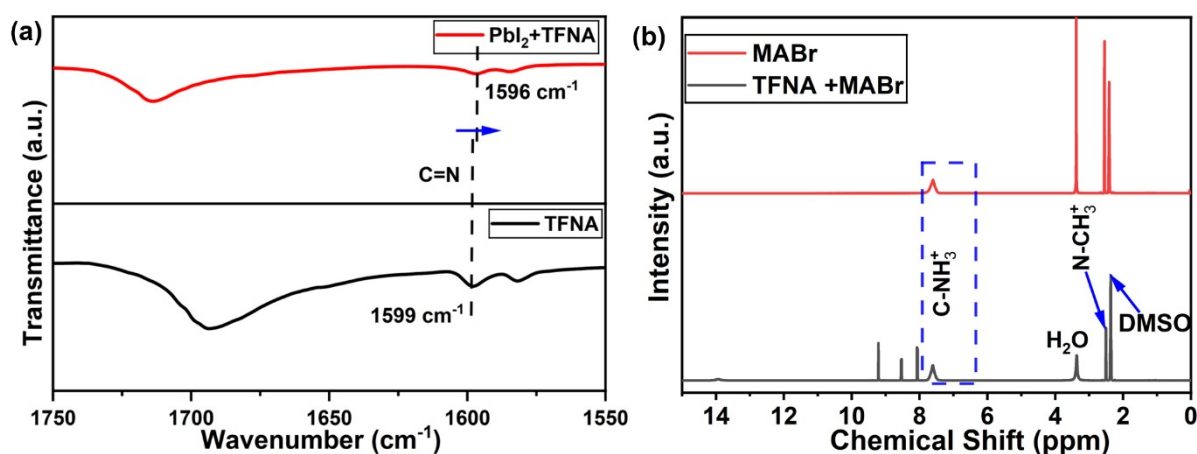


Fig. S5: (a) FTIR spectra of C=N stretching frequency of TFNA and TFNA+ PbI_2 (b) ^1H NMR spectra of the additive molecule and its mixture with MABr in DMSO- d_6 solvent.

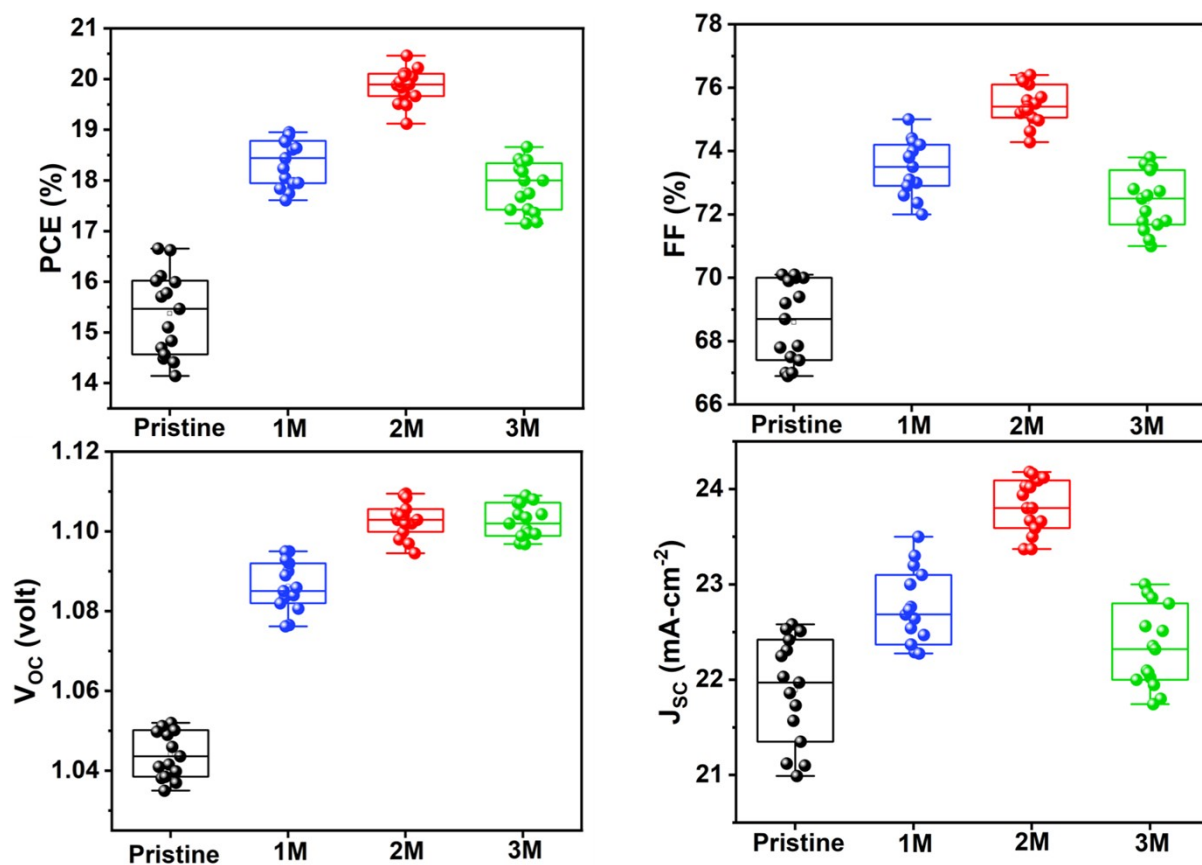


Fig. S6: Statistical distribution of PCE, FF, V_{oc} , and J_{sc} respectively for a batch of 15 pristine as well as all modified devices.

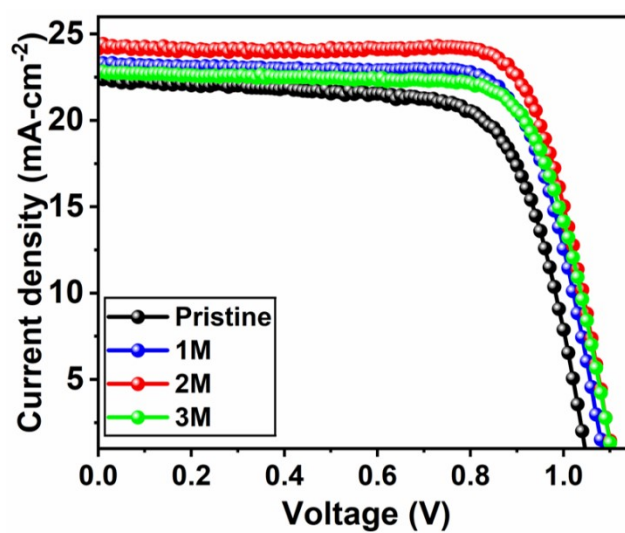


Fig. S7: J - V curves of PSCs with different concentration of TFNA.

Device	J _{SC} (mA-cm ⁻²)	V _{OC} (Volt)	FF (%)	PCE (%)
Pristine	22.56	1.052	70.1	16.64
1M	23.20	1.090	74.7	18.88
2M	24.16	1.108	76.4	20.45
3M	22.80	1.109	73.8	18.66

Table S1 Device parameters of pristine and different concentration of TFNA additive based PSC.