

Supporting Information

Diammonium Spacer-Induced Stable Zigzag Type 2D Dion-Jacobson Lead/Tin-Based Perovskite Solar Cells

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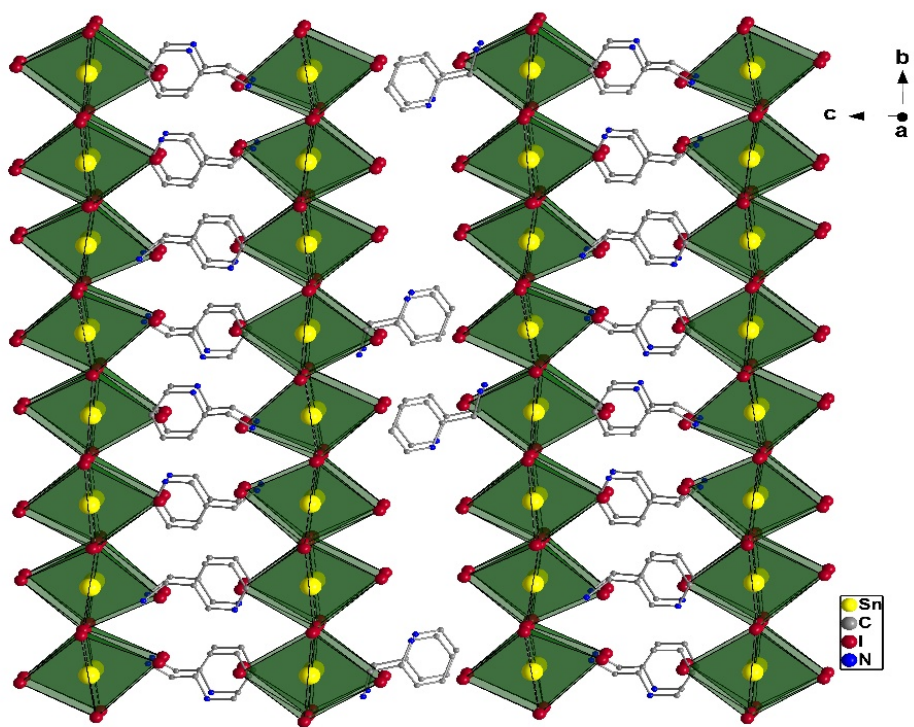


Figure S1. Crystal structure of $C_{18}H_0I_{16}N_6Sn_4$

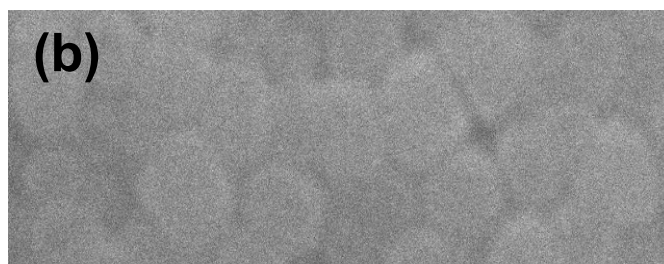
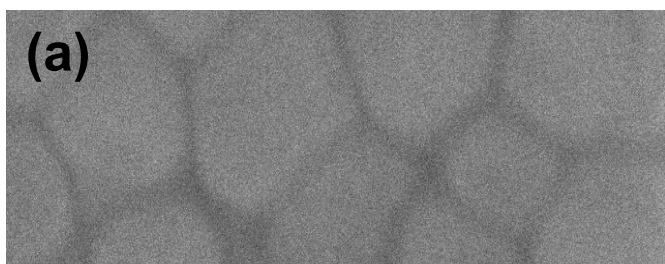


Figure S2. The enlarged SEM images of the (a) 10% and (b) 15% of 3API₂ added FA(Pb_{0.5}Sn_{0.5})I₃ perovskite films.

Table S1. Full width half maximum (FWHM) values calculated from the (110) diffraction peak in Figure

3API₂ added ammout/%	0	5	10	15	20
FWHM (110) /degrees	0.095	0.097	0.098	0.094	0.099
FWHM (220) /degrees	0.123	0.121	0.121	0.120	0.124

7b.

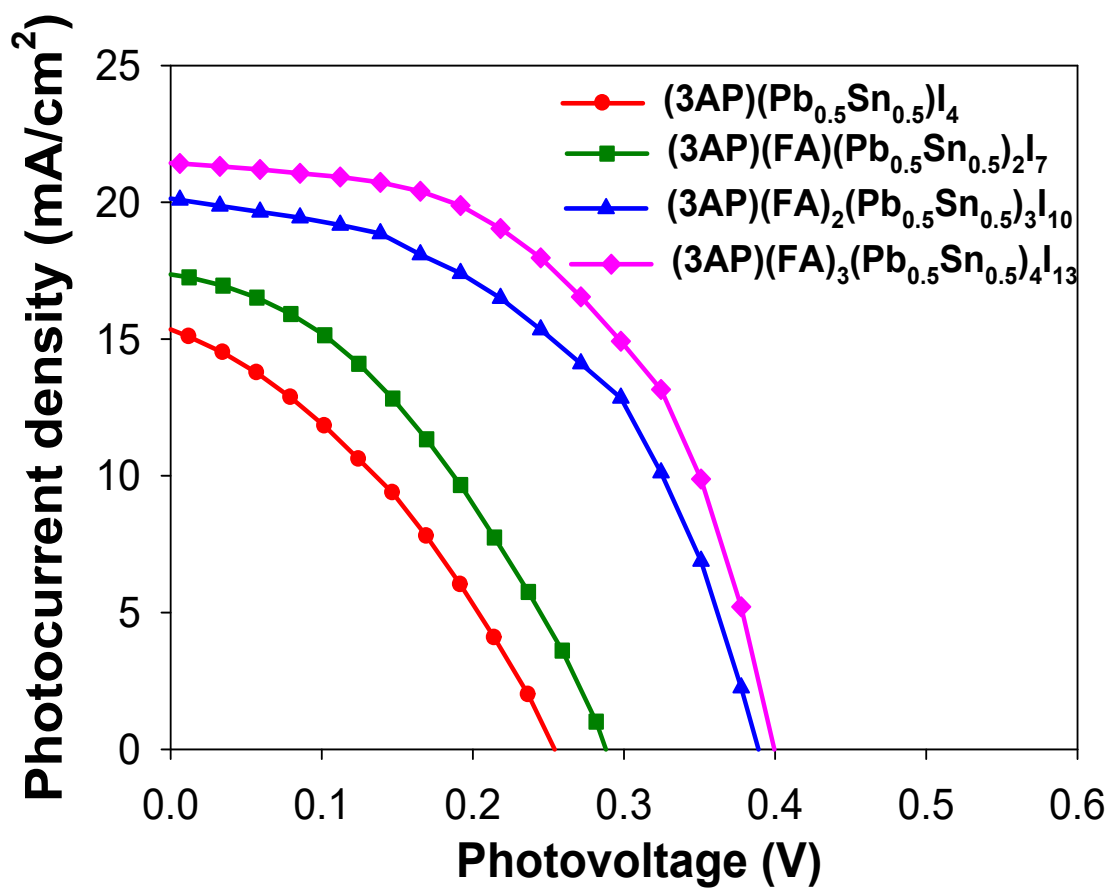


Figure S3. J-V curves of the 2D DJ (3AP)FA_{n-1}(Pb_{0.5}Sn_{0.5})_nI_{3n+1} (n = 1, 2, 3, 4) based devices

Table S2. The photovoltaic parameters of the 2D DJ (3AP)FA_{n-1}(Pb_{0.5}Sn_{0.5})_nI_{3n+1} (n = 1, 2, 3, 4) based devices

Perovskites	Jsc [mA/cm²]	Voc [V]	FF [%]	PCE [%]
(3AP)(Pb _{0.5} Sn _{0.5})I ₄	15.47	0.25	35.04	1.38
(3AP)(FA)(Pb _{0.5} Sn _{0.5}) ₂ I ₇	17.42	0.29	38.27	1.92
(3AP)(FA) ₂ (Pb _{0.5} Sn _{0.5}) ₃ I ₁₀	20.10	0.39	49.39	3.86
(3AP)(FA) ₃ (Pb _{0.5} Sn _{0.5}) ₄ I ₁₃	21.37	0.40	51.81	4.42