

Supplementary Materials

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Table S1: Description of the deposition parameters, from which the hydrogen dilution (HD) and the ratio of doping gas (R), for the production of nc-Si:H PV cells by PECVD.

n-Si:H cell layer	Power density (mW/cm ²)	Frequency (MHz)	Electrode distance (mm)	Temperature (°C)	Pressure (Torr)	HD (%)	R(%)	Deposition time (s)
n	69.44	13.56	10	180	2	96.7	1	16'20"
n (a)	20.83	13.56	16.5	170	1	66.67	3	56"
seed layer 3	138.89	75	23-13	170	1	98.4-98.5	0	10'
i	138.89	75	13	170	1	97.3	0	1h53'39"
p	90.28	13.56	10	170	2.4	99.29	0.56	4'54"

Table S2: Description of the deposition parameters for the production of CsPbBr₃ NCs thin films, from the colloidal perovskite, on nc-Si:H PV cells, via spin-coating.

Glass sample with deposited nc-Si:H PV cells (nr. of depositions; concentration NCs)	NCs to 10% (weight) polyethylene-hexane solution ratio	Spin-coater parameters	Thermal annealing
(1 deposition; pellet re-dispersed in 2.5 mL of hexane)	1:2, followed by an thermal anneal	Time: 30 s Velocity: 1500 rpm Acceleration: 500 rpm/s	50 °C during 5 min

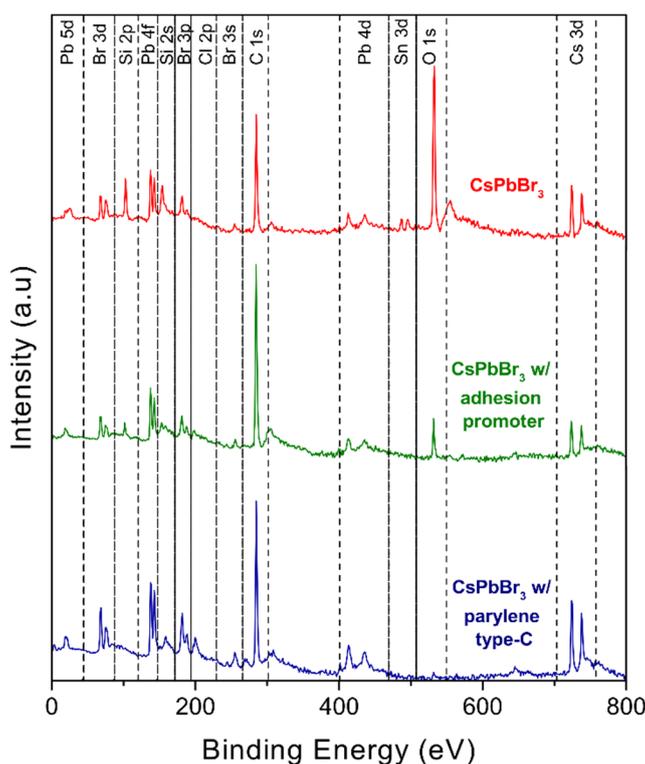


Figure S1: XPS spectra for the different elements present in the CsPbBr₃ NCs thin film, the CsPbBr₃ NCs thin film with the incorporation of the adhesion promotor and the CsPbBr₃ NCs-parylene type C thin film.

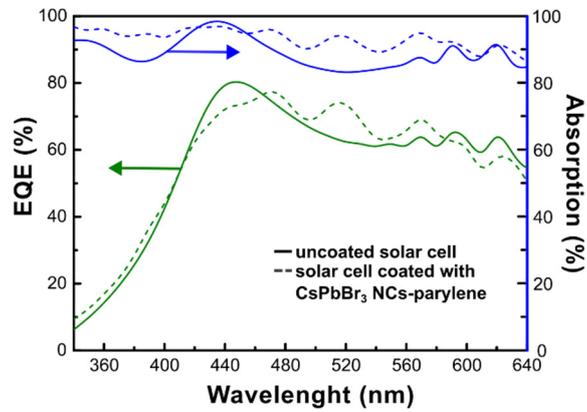


Figure S2: EQE (green lines) and absorption (blue lines) of the solar cell of replica i before (solid line) and after (dashed line) the incorporation of the CsPbBr₃ NCs-parylene type C thin film.

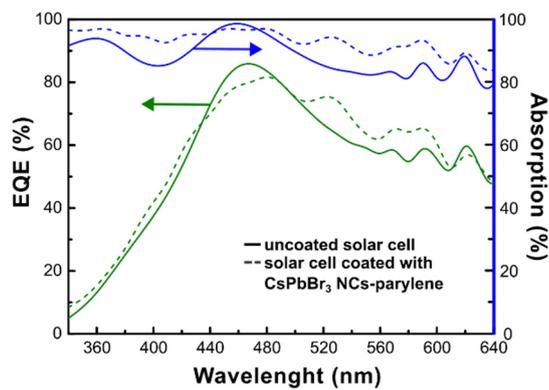


Figure S3: EQE (green lines) and absorption (blue lines) of the solar cell of replica iii before (solid line) and after (dashed line) the incorporation of the CsPbBr₃ NCs-parylene type C thin film.

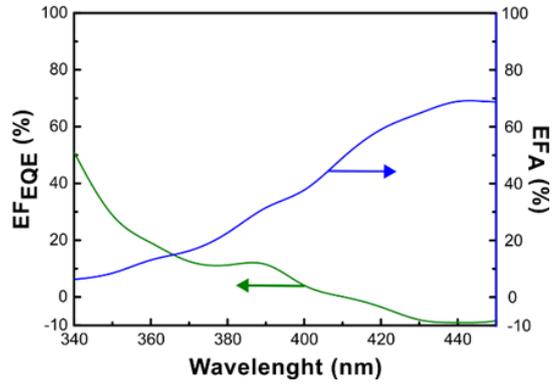


Figure S4: Enhancement factor for the EQE and absorption of the i solar cell replica, calculated from the relative percentage differences between the uncoated PV cell and the coated PV cells with the CsPbBr₃ NCs-parylene type C thin film.

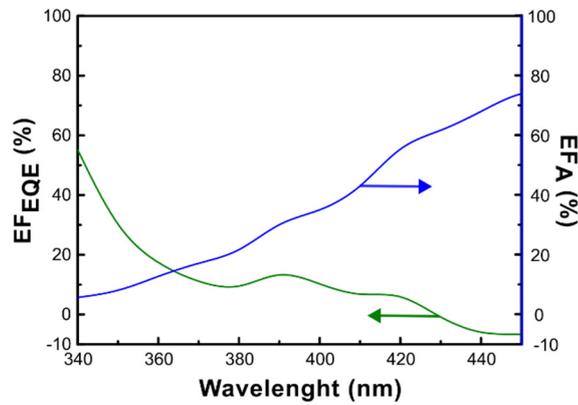


Figure S5: Enhancement factor for the EQE and absorption of the ii solar cell replica, calculated from the relative percentage differences between the uncoated PV cell and the coated PV cells with the CsPbBr₃ NCs-parylene type C thin film.

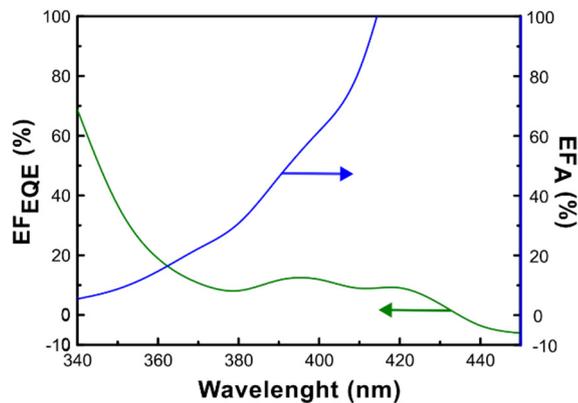


Figure S6: Enhancement factor for the EQE and absorption of the iii solar cell replica, calculated from the relative percentage differences between the uncoated PV cell and the coated PV cells with the CsPbBr₃ NCs-parylene type C thin film.

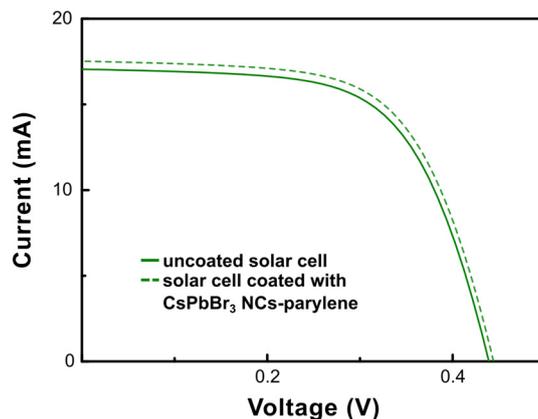


Figure S7: I-V curve of replica ii before (solid green line) and after (dashed green line) the incorporation of the CsPbBr₃ NCs-parylene type C thin film.

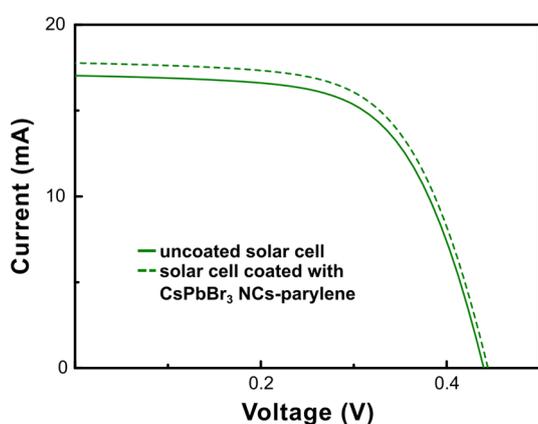
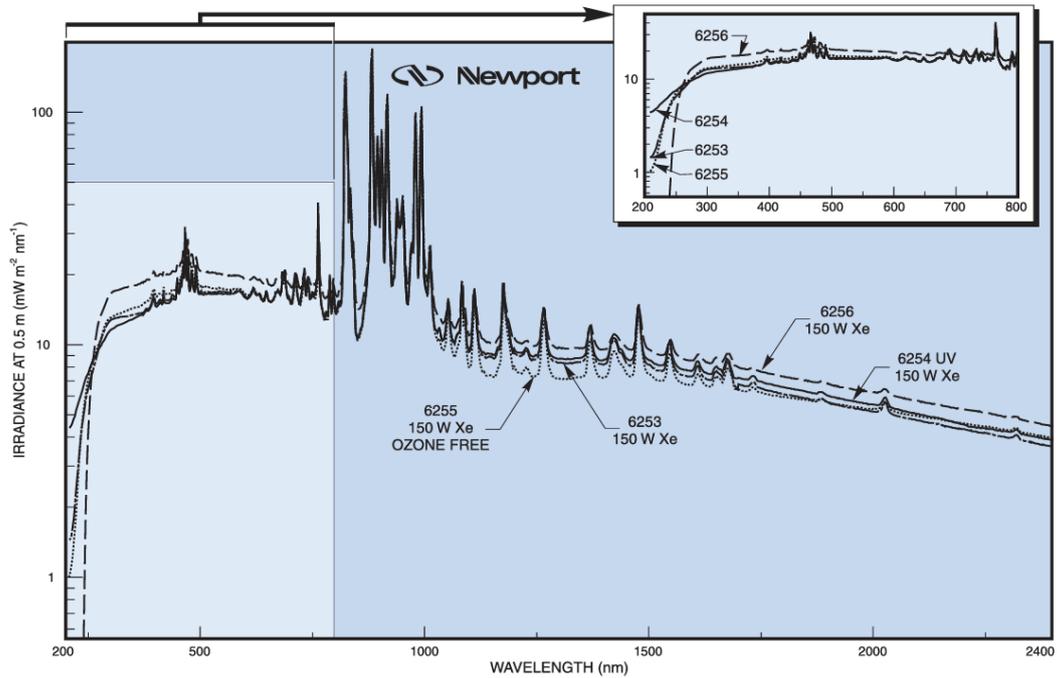


Figure S8: I-V curve of replica iii before (solid green line) and after (dashed green line) the incorporation of the CsPbBr₃ NCs-parylene type C thin film.

Table S3: Measured photovoltaic cell parameters for replicas i, ii, and iii, when uncoated and coated with the CsPbBr₃ NCs-parylene type C thin film: open-circuit voltage, short-circuit current, short-circuit current density, maximum current, maximum voltage, maximum power, fill factor and efficiency.

PV cell replica	Voc (V)	Isc (mA)	Jsc (mA/cm ²)	I _{max} (mA)	V _{max} (V)	P _{max} (mW)	Fill Factor (%)	Efficiency (%)
i uncoated	0.44	3.20	17.14	2.72	0.32	0.87	61.63	4.65
i coated	0.45	3.31	17.78	2.82	0.32	0.91	61.68	4.89
ii uncoated	0.44	3.18	17.06	2.72	0.32	0.87	62.67	4.69
ii coated	0.44	3.28	17.60	2.80	0.33	0.91	62.75	4.91
iii uncoated	0.44	3.18	17.04	2.71	0.32	0.87	62.49	4.68
iii coated	0.43	3.25	17.45	2.83	0.33	0.94	66.18	5.02

Method details



This is the spectral irradiance profile from the used irradiation source for the spectral response measurements (using a Newport-Oriel ® 6255, 150W, Ozone Free Xe ARC Lamp). This information is provided by the fabricant and can be consulted in the following website: <https://www.newport.com/p/6255>