

Electronic supplementary information

Perylene diimide based polymer: a dual function interfacial material for efficient perovskite solar cells

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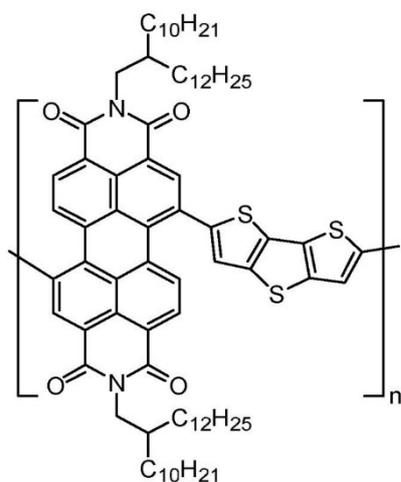


Fig. S1 Molecular structure of PPDIDTT.

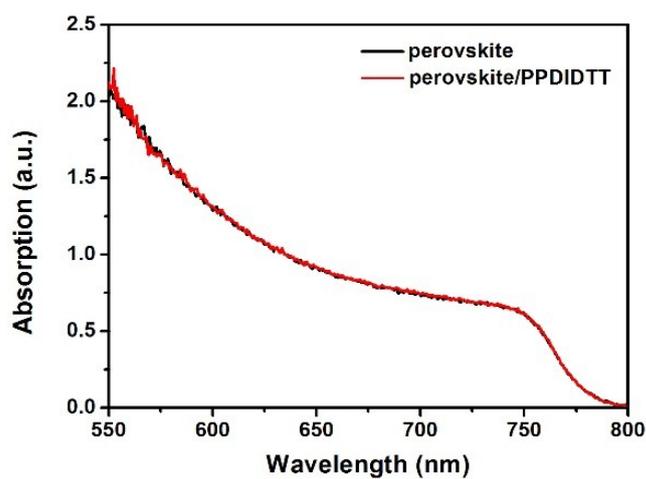


Fig. S2 UV-vis absorption spectra of the neat perovskite film and PPDIDTT coated perovskite film.

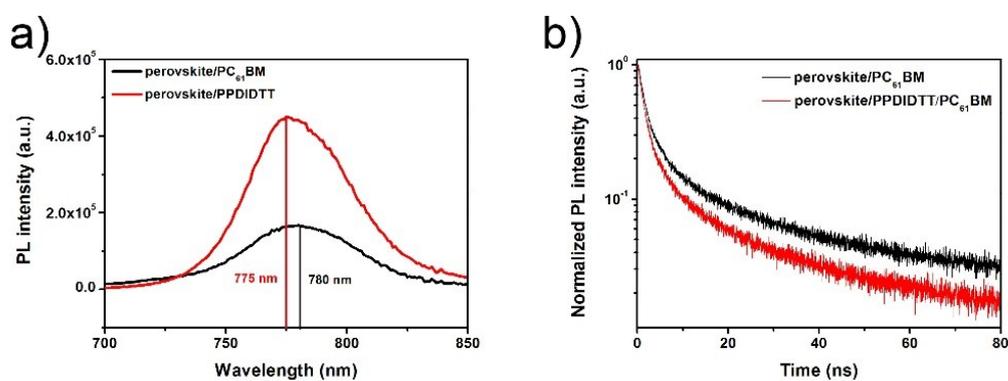


Fig. S3 (a) Steady-state PL spectra of the perovskite/PC₆₁BM and the perovskite/PPDIDTT films. (b)

Time-resolved transient PL spectra of the perovskite/PC₆₁BM and the perovskite/PPDIDTT/PC₆₁BM films.

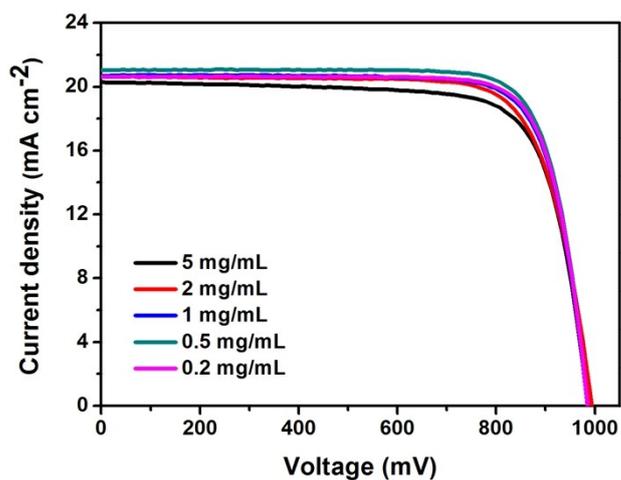


Fig. S4 J - V curves of modified devices with PPDIDTT interfacial layer deposited with its solution under different concentrations.

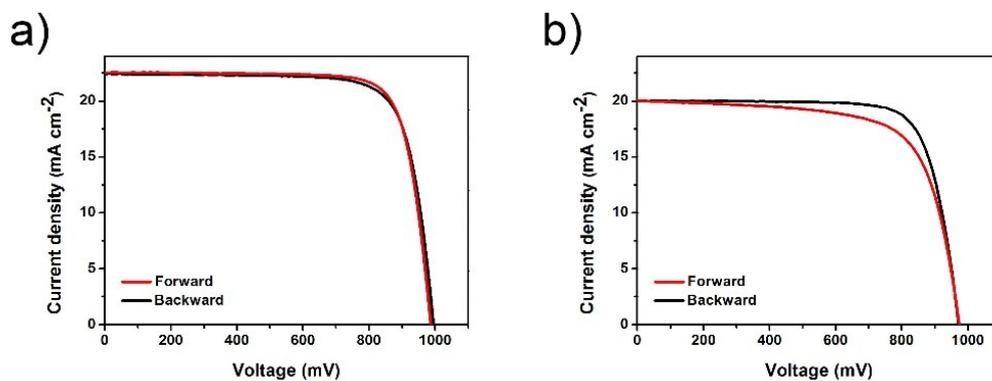


Fig. S5 The hysteresis effect in J - V curves of the modified device with PPDIDTT interfacial layer (a) and control device without PPDIDTT (b).

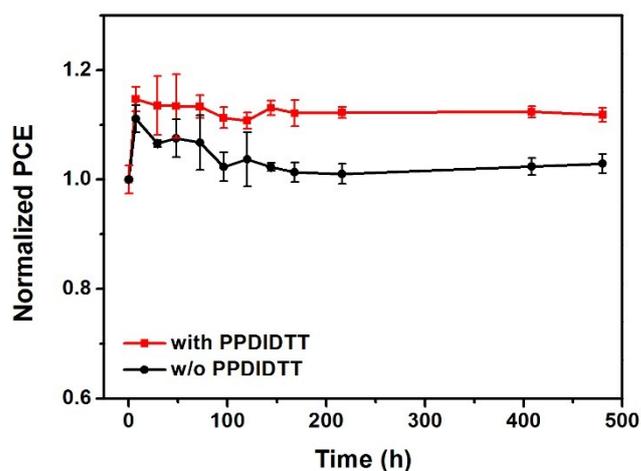


Fig. S6 The normalized PCE degradation of 10 individual devices with and without PPDIDTT interfacial layer.

Table S1. Photovoltaic parameters of the modified devices with PPDIDTT interfacial layer deposited with its solution under different concentrations.

| Concentration (mg/mL) | J_{SC} (mA cm ⁻²) | V_{OC} (mV) | FF (%) | PCE (%) |
|-----------------------|---------------------------------|---------------|--------|---------|
| 5 | 20.0 | 990 | 76.1 | 15.1 |
| 2 | 20.6 | 990 | 76.6 | 15.7 |
| 1 | 20.7 | 990 | 78.1 | 16.0 |
| 0.5 | 21.1 | 990 | 79.1 | 16.5 |
| 0.2 | 20.6 | 990 | 79.1 | 16.1 |