

## Supporting Information

### Amorphous polymer with C=O to improve the performance of perovskite solar cells

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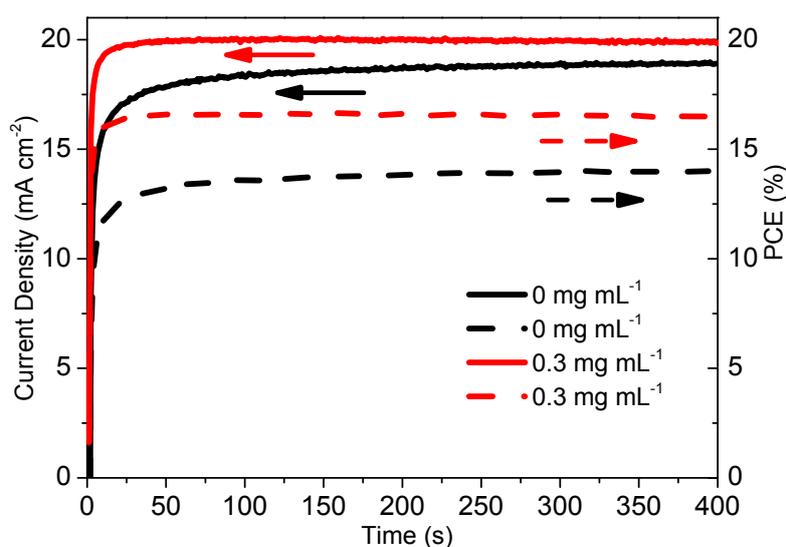


Figure S1. Steady-state current density and corresponding PCE measured at bias voltage of 0.74 V for pristine device and 0.83 V for 0.3 mg mL<sup>-1</sup> PVP treated device. The solid lines represent current density and the dotted lines represent PCE.

Figure S1 shows steady-state photocurrent and corresponding PCE output at bias voltage of 0.74 V for pristine device and 0.83 V for 0.3 mg mL<sup>-1</sup> PVP treated device. As shown, the steady-state current density and PCE reach 19.76 mA cm<sup>-2</sup> and 16.40% within 20 s for 0.3 mg mL<sup>-1</sup> PVP modified device and maintain within narrow margins in 400s (19.76 mA cm<sup>-2</sup>-20.08 mA cm<sup>-2</sup> and 16.40%-16.67% respectively), however the steady-state current density of pristine device changes with time over a wide range in 400s (17.08 mA cm<sup>-2</sup>-18.97 mA cm<sup>-2</sup>) after it reach 17.08 mA cm<sup>-2</sup> within 20 s, the corresponding PCE follow the same trend with steady-state photocurrent (12.64%-14.04%). This result demonstrated that modified device shows outstanding stability of efficiency contrast to pristine device. The improved stability of efficiency for devices with 0.3 mg

mL<sup>-1</sup> PVP additive could be attributed to the improved crystallinity and improved morphology.