Humidity versus photo-stability of metal halide perovskite films in a polymer matrix

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Figure SI 1: Cross-sectional micrograph of a perovskite film developed in glove box. Figure taken from our past report with permission.†
PL spectra of perovskite films on TiO$_2$ coated glass substrates.

**Figure SI 2**: PL spectra of perovskite film on a TiO$_2$ coated glass substrates to quantify optical quenching of the four films.
Figure SI 3: Absorbance spectra of 0 and 5 wt.% PEP films in dark (a & b).
Figure SI 3: Absorbance spectra of 10 and 20 wt.% PEP films in dark (c & d).
Figure SI 4: Absorbance spectra of 0 and 5 wt.% PEP films in light (a & b).
Figure SI 4: Absorbance spectra of 10 and 20 wt.% PEP films in light (c & d).
Figure SI 5: PL spectra of 0 and 5 wt.% PEP films in dark (a & b).
Figure SI 5: PL spectra of 10 and 20 wt.% PEP films in dark (c & d).
Figure SI 6: PL spectra of 0 and 5 wt.% PEP films in light (a & b).
Figure SI 6: PL spectra of 10 and 20 wt.% PEP films in light (c & d).
FTIR of Fresh perovskite films

Figure SI 7: FTIR spectra of pure and PVP incorporated perovskite films.

Figure SI 8: FTIR spectra of pure and PVP incorporated perovskite films degraded in dark.
Figure S1 9: Chemical structure of poly-(vinylpyrrolidone) (PVP)
Fabrication of perovskite solar cells

PSCs were fabricated in a glove box via single step deposition of CH$_3$NH$_3$PbI$_{3-X}$Cl$_X$ over a ~70 nm compact TiO$_2$ layer (3000 rpm for 40 sec) formed using DC sputtering and annealed at 450 °C. Spiro-OMETAD is deposited on top of perovskite using a method reported elsewhere.$^{1,2}$ A 100 nm thick Au back contact is deposited via thermal evaporation.

References
