Supporting Information

Enhancing Perovskite Solar Cell Stability by TCO Layer Presence beneath MACl-Doped Perovskite

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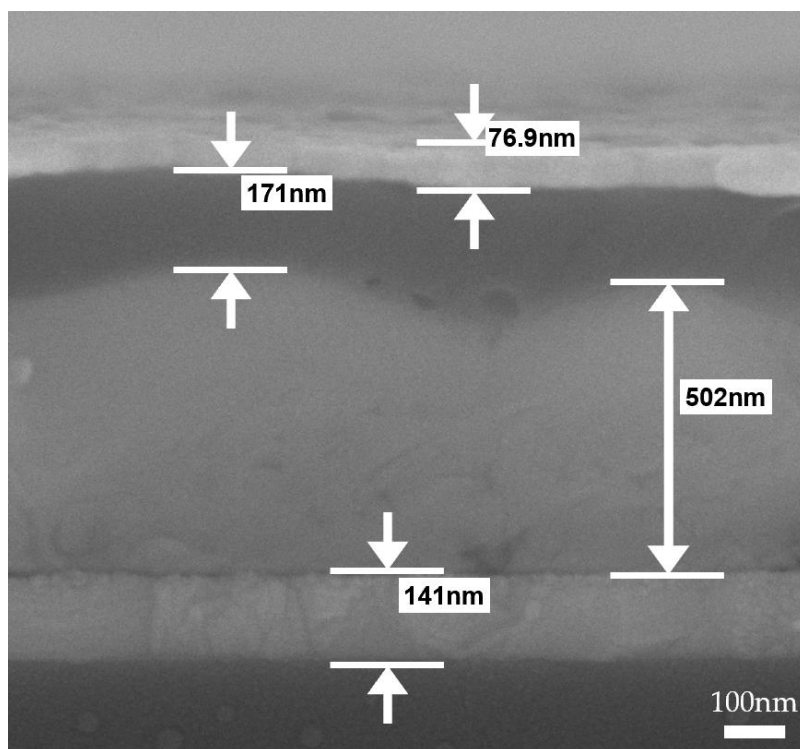
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Figure S1. SEM cross-sectional data for the ITO region under the MACl_O condition, including layer thickness values.
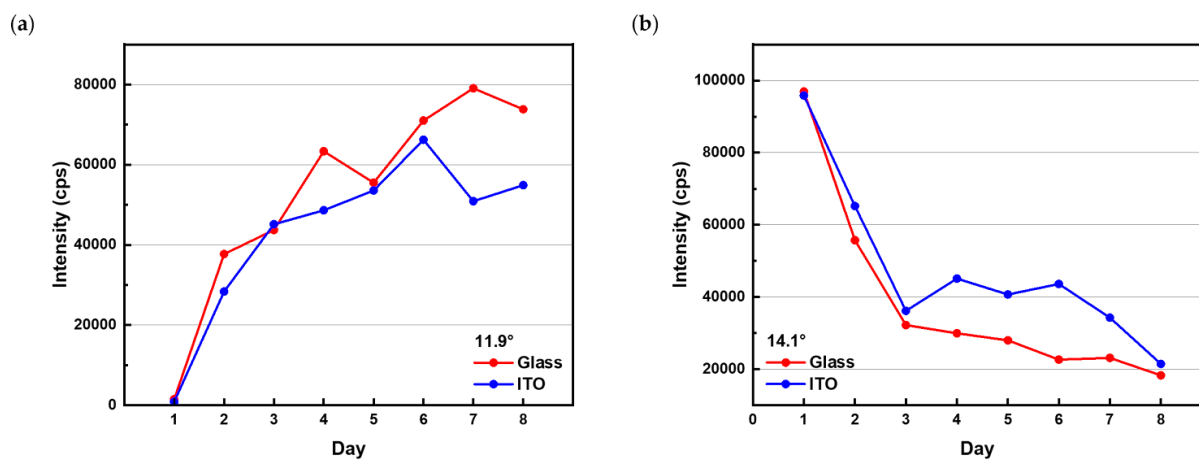

Figure S2. Intensity changes of the perovskite δ-phase peak at 11.9° (a) and α-phase peak at 14.1° (b) over time on glass and ITO substrates under the MACl_O_100 condition.
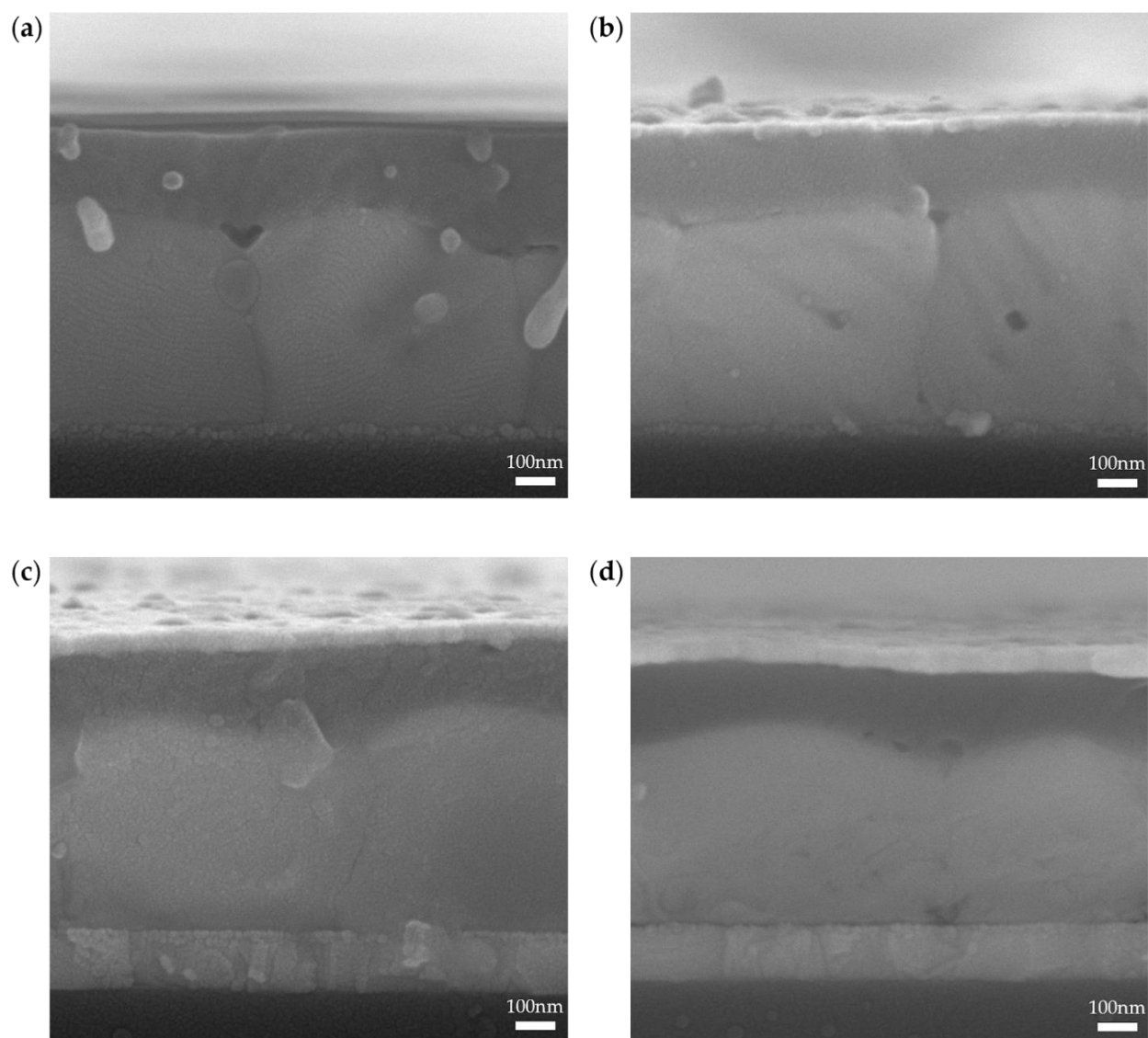
Figure S3. (a) SEM cross-sectional images of perovskite films on glass substrates at Day 1. (b) SEM cross-sectional images of perovskite films on ITO substrates at Day 1. (c) SEM cross-sectional images of perovskite films on glass substrates at Day 8. (d) SEM cross-sectional images of perovskite films on ITO substrates at Day 8.
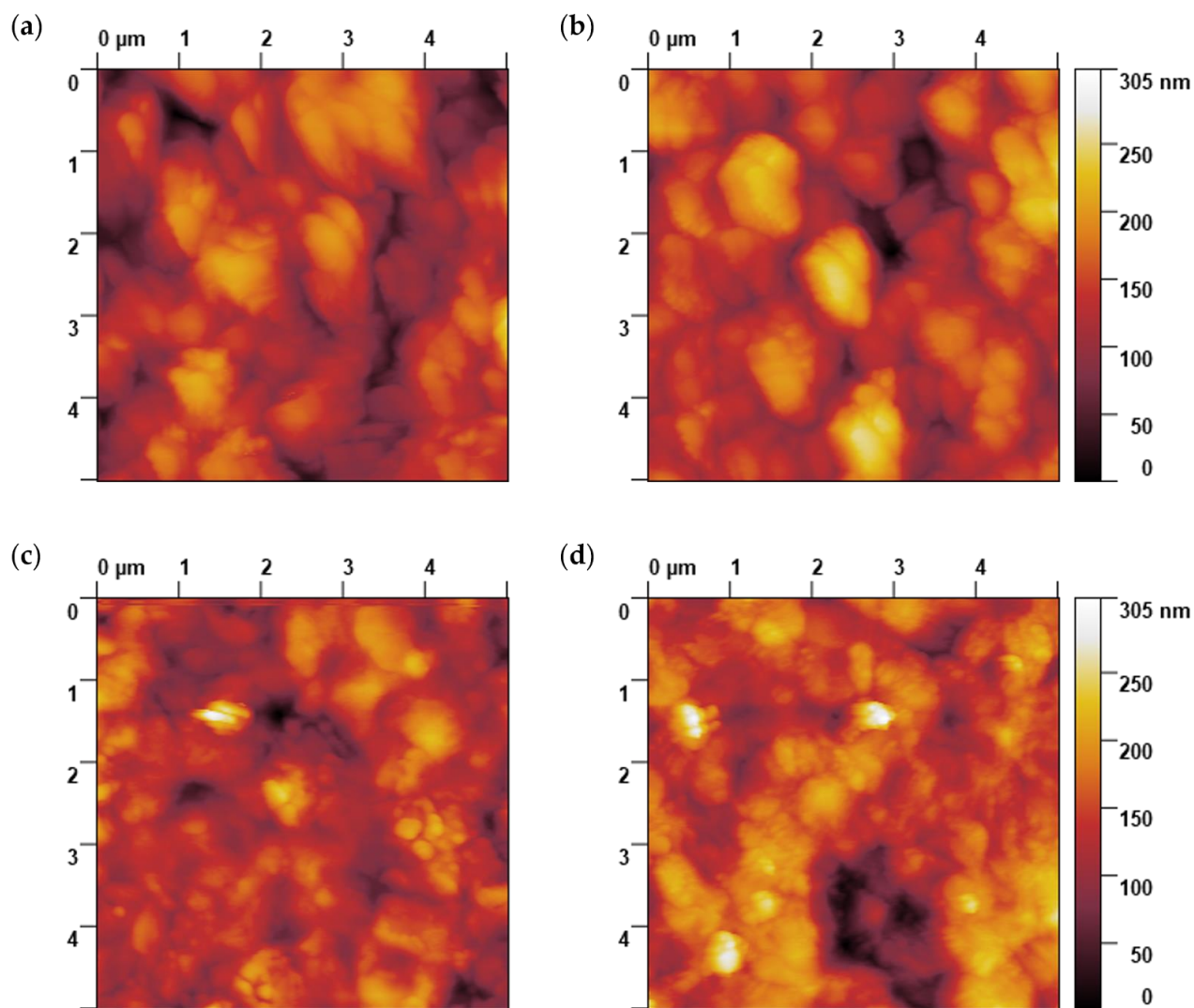
Figure S4. (a) 2D AFM images of perovskite films on glass substrates at Day 1. (b) 3D AFM images of perovskite films on ITO substrates at Day 1. (c) 2D AFM images of perovskite films on glass substrates at Day 8. (d) 2D AFM images of perovskite films on ITO substrates at Day 8.
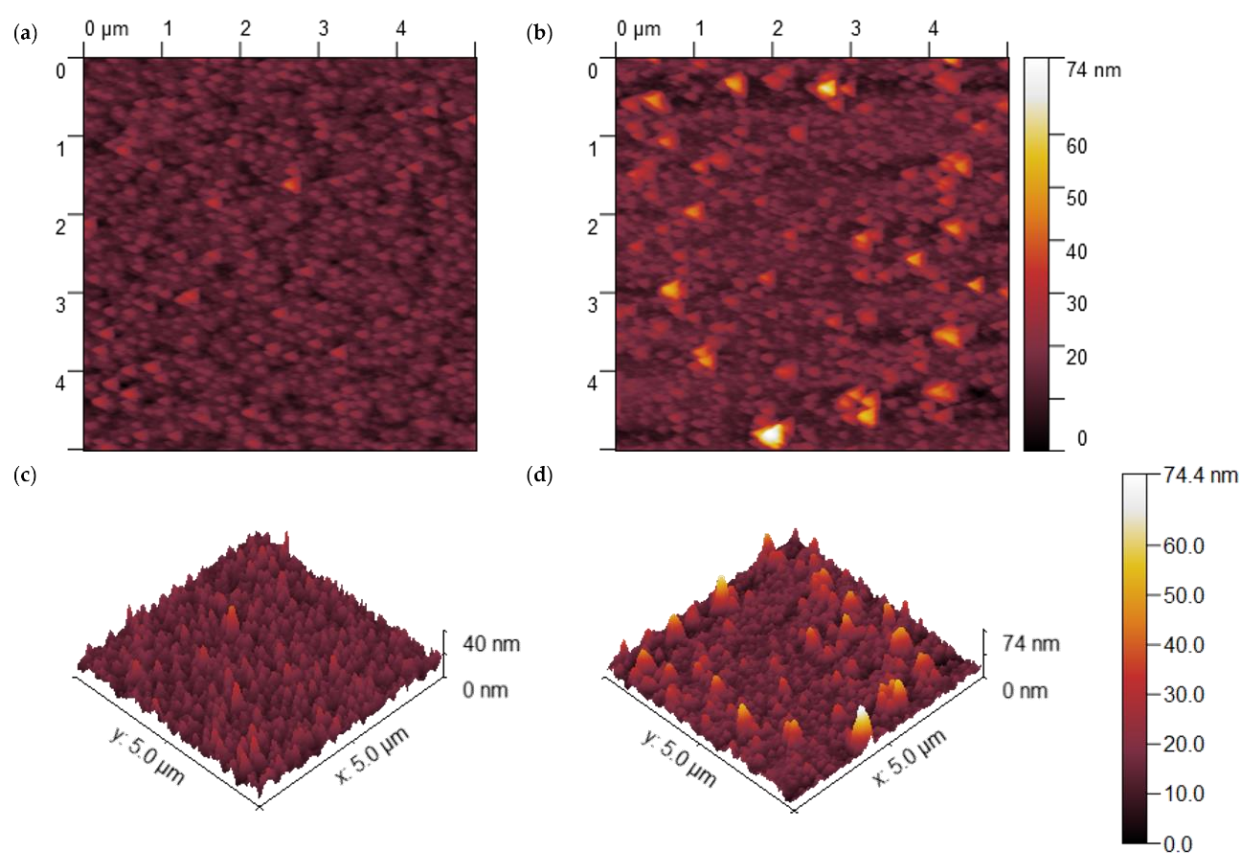
Figure S5. (a) 2D AFM images of glass substrates. (b) 2D AFM images of ITO substrates. (c) 3D AFM images of glass substrates. (d) 3D AFM images of ITO substrate.
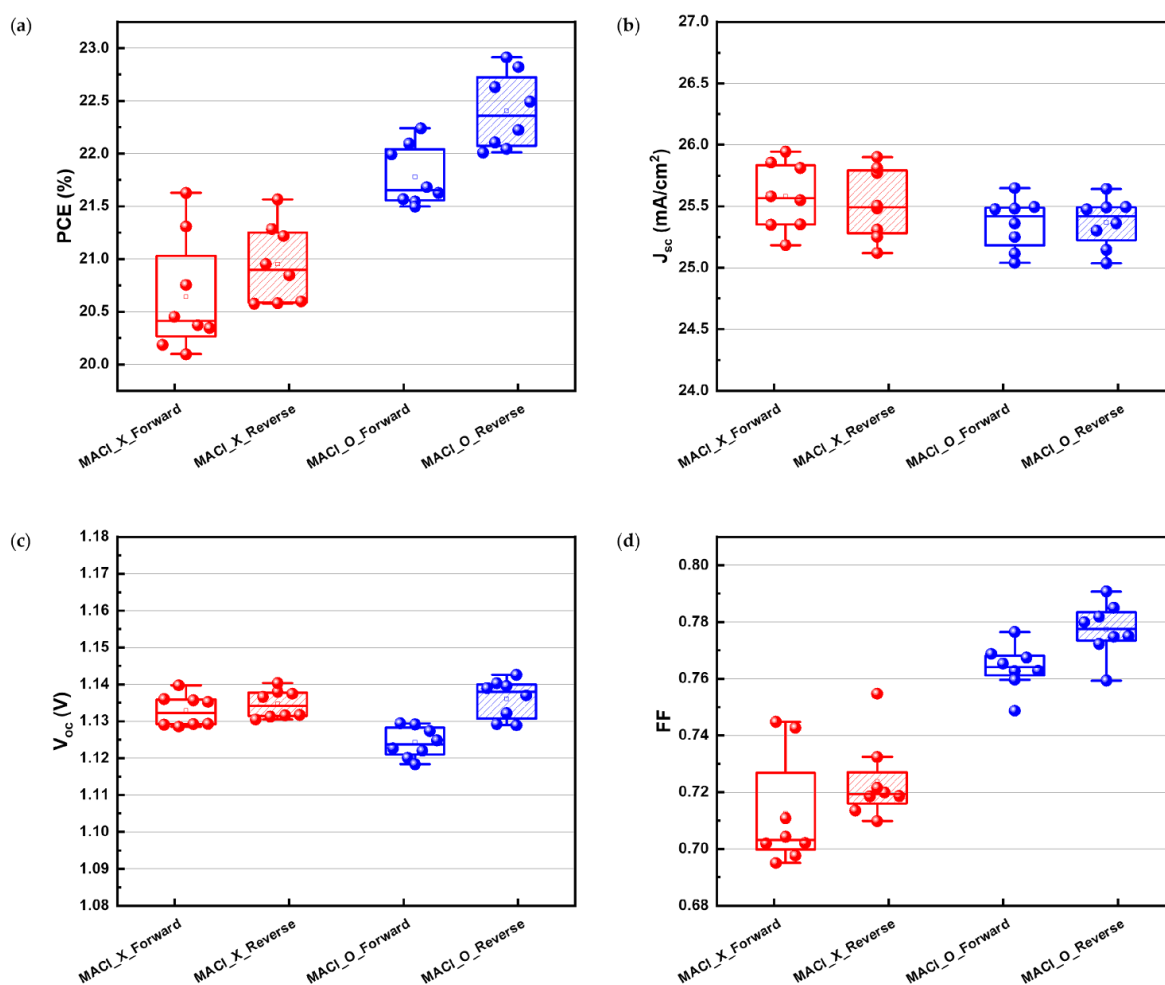
Figure S6. Box plot data for (a) PCE, (b) Jsc, (c)Voc, and (d) FF of perovskite solar cells under MACl_X and MACl_O conditions.

Table S1. The RMS roughness data of glass and ITO substrates.

	Glass	ITO
RMS roughness (nm)	3.810	6.886