

Supplementary Information

Humidity-driven degradation of sputtered molybdenum titanium oxide and molybdenum-titanium-oxide thin films

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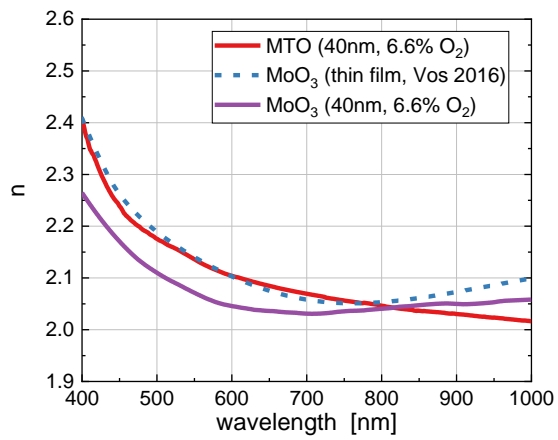
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Figure S1



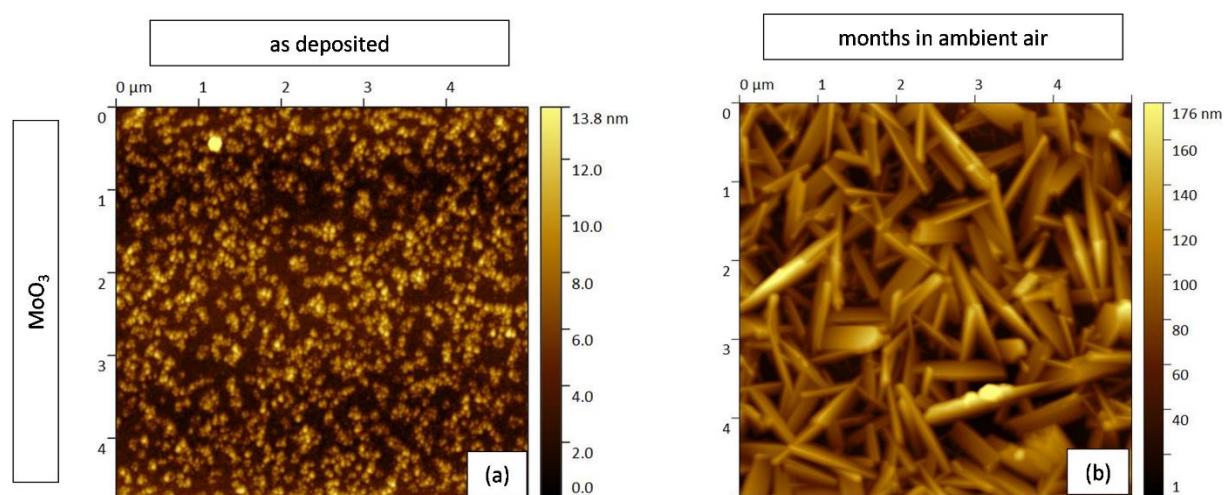
Refractive indices, n , of MTO and MoO₃, extracted from transmittance and reflectance spectra (according to previous works [19, 21]) using a transfer-matrix-method based algorithm. The dashed line shows reported literature values of MoO₃ thin film (M. Vos, B. Macco, N. F. W. Thissen, A. A. Bol, W. M. M. Kessels. Atomic layer deposition of molybdenum oxide from (N^tBu)₂(NMe₂)₂Mo and O₂ plasma, *J. Vac. Sci. Technol. A* 34, 01A103 (2016))

Table S1

sample	N	O	Na	Mg	Al	Si	S	K	Ca	Mo	Au
as-dep.	4.6±1.6	65.3±7.8	2.3±0.4	1.5±0.2	1.1±0.18	5.8±0.5	0.5±0.3	0.5±0.2	0.9±0.2	9.8±0.8	8.3±1.0
30 days	9.3±3.0	65.7±7.9	0.8±0.4	0.4±0.2	0.2±0.1	7.2±0.5	1.533±0.6	0.2±0.1	0.8±0.2	7.7±0.6	6.3±0.9

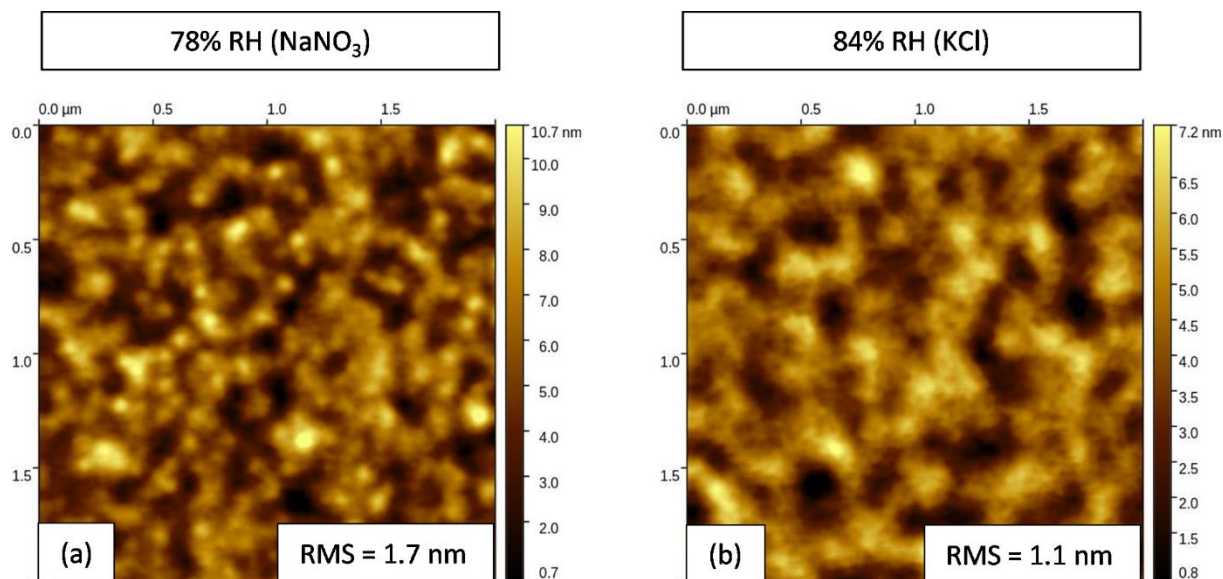
Elemental quantification of EDX measurements on 300 nm thick MoO₃ before and after 30 days in 81% relative humidity. The values are the average of measurements of several different spots on the sample, given in at.% and include the contributions from the underlying soda-lime glass substrate.

Figure S2



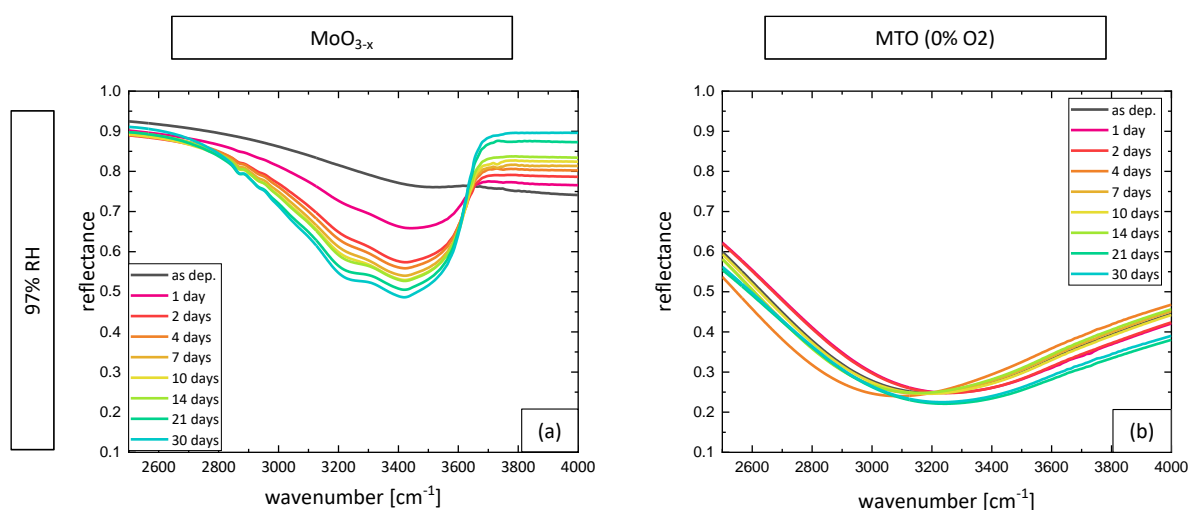
5×5 μm² AFM images of 50 nm thick MoO₃ films on glass, (a) as deposited and (b) after several months of storage in ambient air.

Figure S3



$2 \times 2 \mu\text{m}^2$ AFM images of MoO_3 after 30 days in (a) 78% RH and (b) 84% RH.

Figure S4



Time evolution of IR spectra of oxygen-deficient (i.e. sputtered without O_2) (a) MoO_{3-x} exposed to 97% RH and (b) MTO (0% O_2) exposed to 97% RH.