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Electronic Supplementary Information

Low-Temperature MoO_3 Film from a Facile Synthetic Route for an Efficient Anode Interfacial Layer in Organic Optoelectronic Devices

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1. X-ray Photoemission Spectroscopy (XPS) spectra of $sMoO_3$ prepared under different conditions

We have used KLA-TENCOR XP-200 Profiler to measure the thicknesses of $sMoO_3$ films prepared from 2, 10 and 20 mg ml^{-1} solutions. The thickness of $sMoO_3$ film from 20 mg ml^{-1} solution is about 10 nm, which is almost identical to the height of nanoplate measured by AFM as shown in Figure 2. However, the thickness of $sMoO_3$ films from 2 and 10 mg ml^{-1} are too thin to be determined precisely, due to the discontinuous nature of film prepared from the diluted solution. To further elucidate the surface morphology of $sMoO_3$, we use XPS to measure the surface electronic property of $sMoO_3$ prepared under different conditions on the ITO substrate. As shown in Figure S1, ITO and $sMoO_3$ from 2 mg ml^{-1} solution have almost overlapping characteristic peaks of In 3p, In 3d and Sn 3d in the full XPS spectra, indicating discontinuous $sMoO_3$ film on ITO. This is consistent with the discrete nanoplate image of $sMoO_3$ from 2 mg ml^{-1}, as shown in Fig. 2(b). $sMoO_3$ from 10 mg ml^{-1} solution shows remarkably reduced intensity of In 3p, In 3d and Sn 3d, meaning a certain thick $sMoO_3$ film covering the ITO substrate. Since the detected depth of XPS is about 5 nm, and the characteristic peaks of ITO still exist in $sMoO_3$ film from 10 mg ml^{-1} solution, the thickness of such $sMoO_3$ film is less than 5 nm. For the $sMoO_3$ from 20 mg ml^{-1} solution, no characteristic peaks of ITO are found in XPS spectrum, referring that the ITO substrate is completely covered by the $sMoO_3$ film.

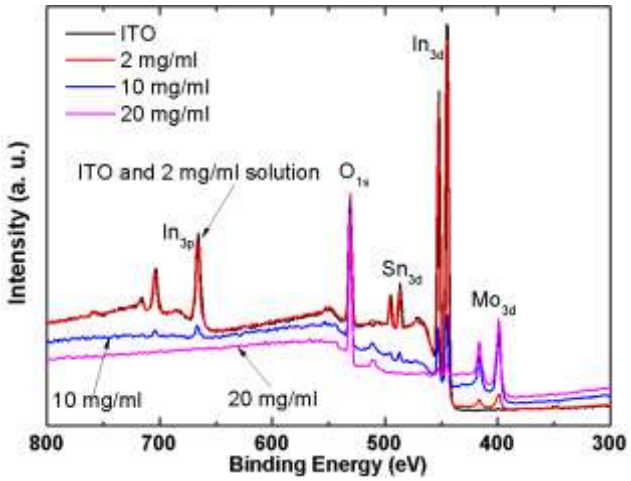

Fig. S1 XPS spectra of $sMoO_3$ prepared under different conditions on ITO substrate.

2. Optical transparency of $sMoO_3$

Fig. S2 shows the optical transmission of PEDOT:PSS (9000 rpm) with 10 nm thickness and $sMoO_3$ (about 10 nm thickness) from 20 mg ml^{-1} solution. At the wavelength larger than 350 nm, the optical transmission of $sMoO_3$ is larger than that of PEDOT:PSS. The optical transmission of $sMoO_3$ is nearly 100% in the visible light region, indicating ultra high transparency of $sMoO_3$ film with 10 nm.

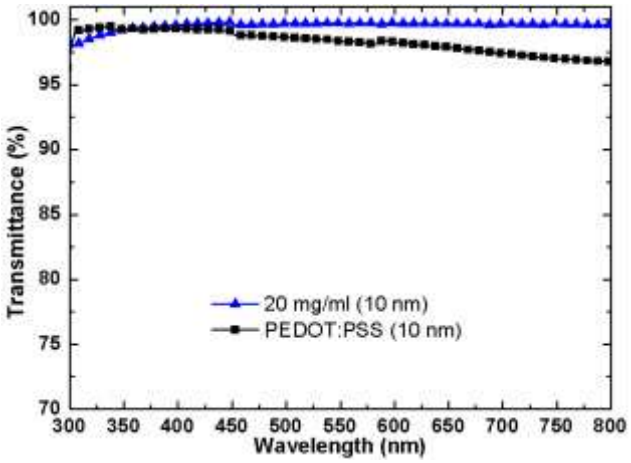

Fig. S2 Optical transparency of $sMoO_3$ and PEDOT:PSS with the almost same thickness.

3. UPS Spectra of $sMoO_3$.

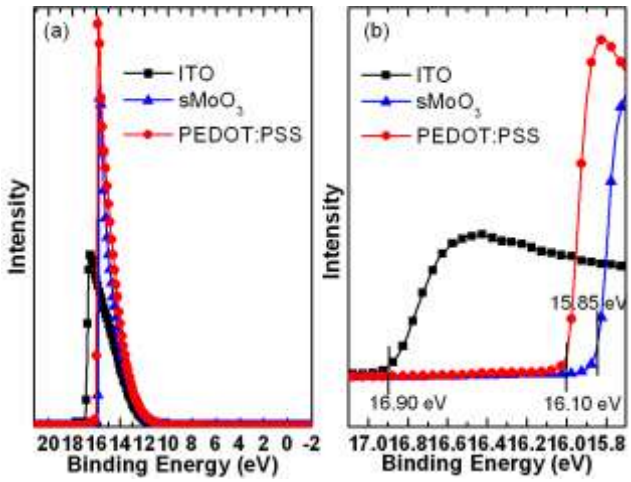

Fig. S3 UPS spectra of $sMoO_3$, PEDOT:PSS and ITO, including (a) the full UPS spectrum using He I radiation, and (b) secondary-electron cutoff.