

# Ultra-large Optical Modulation of Size Tunable Flexible Electrochromic Honeycomb Mesoporous Tungsten Oxide Film

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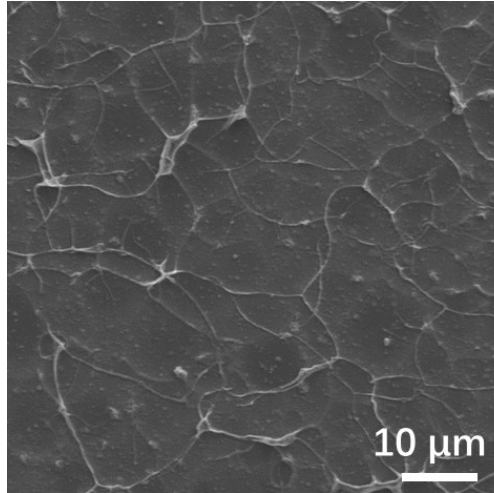
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## KEYWORDS

Nanowire; Self-assembly; Honeycomb pattern; Tungsten oxide



**Figure S1.** SEM image of the discontinued  $W_{18}O_{49}$  nanowire networks prepared from 0.2 mg/ml nanowire dispersion.

**Table S1.** Statistics of each pore size and corresponding wall thickness of the HMP films prepared from different humidity conditions (Experiment temperature: 25°C, NWs concentration: 1 mg/mL).

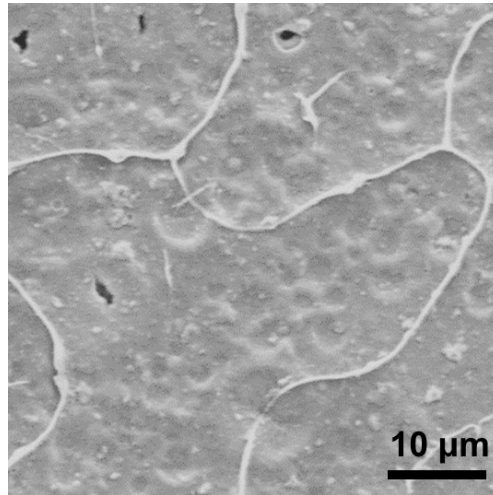
<b>Humidity(%RH)</b>	<b>65</b>	<b>75</b>	<b>85</b>	<b>95</b>
Pore size( $\mu\text{m}$ )	-	1.84	2.58	4.76
Pore wall( $\mu\text{m}$ )	-	1.9	1.6	1.2

**Table S2.** Statistics of each pore size and corresponding wall thickness of the HMP films prepared from different humidity conditions (Experiment humidity: 95 %RH, NWs concentration: 3 mg/mL).

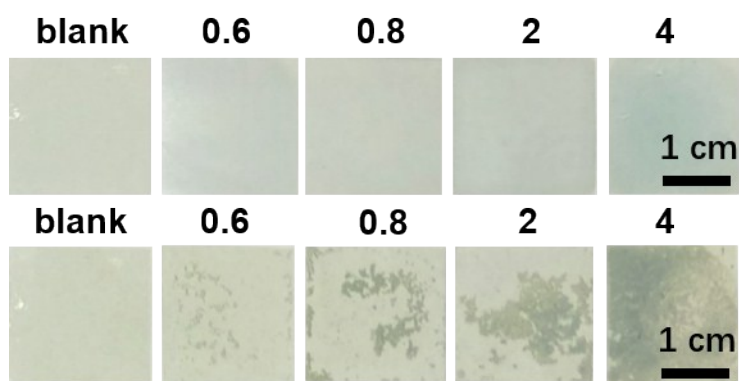
<b>Temperature (°C)</b>	<b>20</b>	<b>30</b>
Pore size( $\mu\text{m}$ )	10.55	7.82
Pore wall( $\mu\text{m}$ )	1.3	1.2

**Table S3.** Statistics of each pore size and corresponding wall thickness of the HMP films prepared from different concentrations (Experiment temperature: 25°C, humidity: 75 %RH).

<b>Concentration(mg/mL)</b>	<b>0.2</b>	<b>0.4</b>	<b>0.6</b>	<b>0.8</b>	<b>2.0</b>	<b>4.0</b>
Pore size( $\mu\text{m}$ )	-	5.95	3.87	2.70	1.92	-
Pore wall( $\mu\text{m}$ )	-	0.72	0.95	1.13	1.46	-



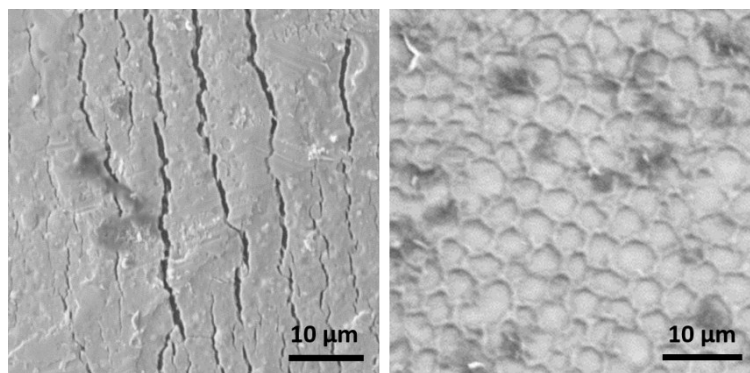
**Figure S2.** SEM image of the  $W_{18}O_{49}$  nanowire film prepared by drop-casting method.



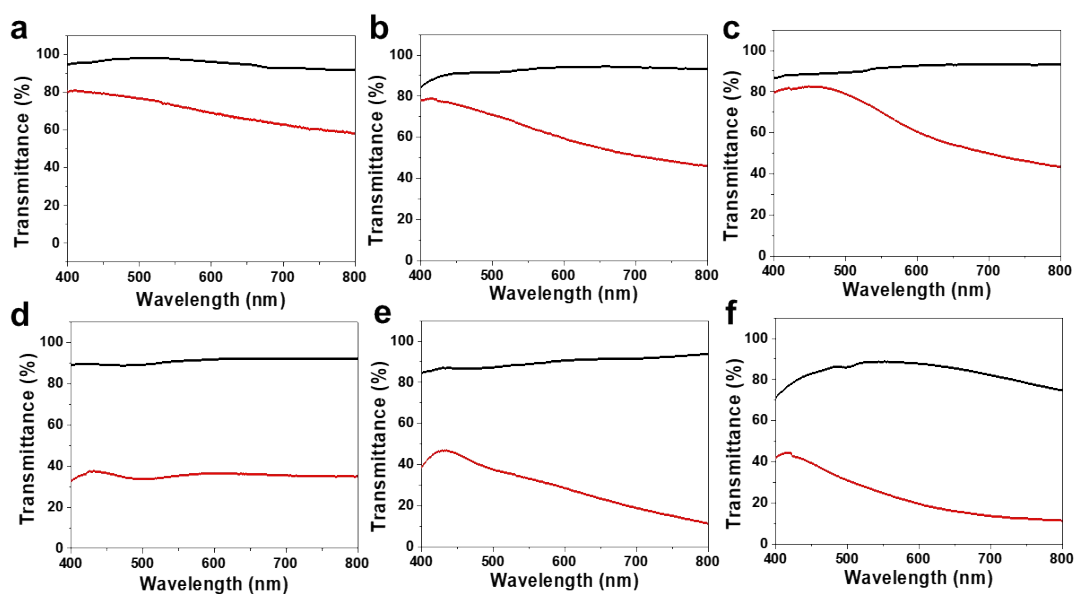
**Figure S3.** Pictures of  $W_{18}O_{49}$  nanowire films prepared from breath figure (top) and drop-casting (down) methods on ITO-PET substrates with different concentrations (0.6 mg/mL to 4 mg/mL).



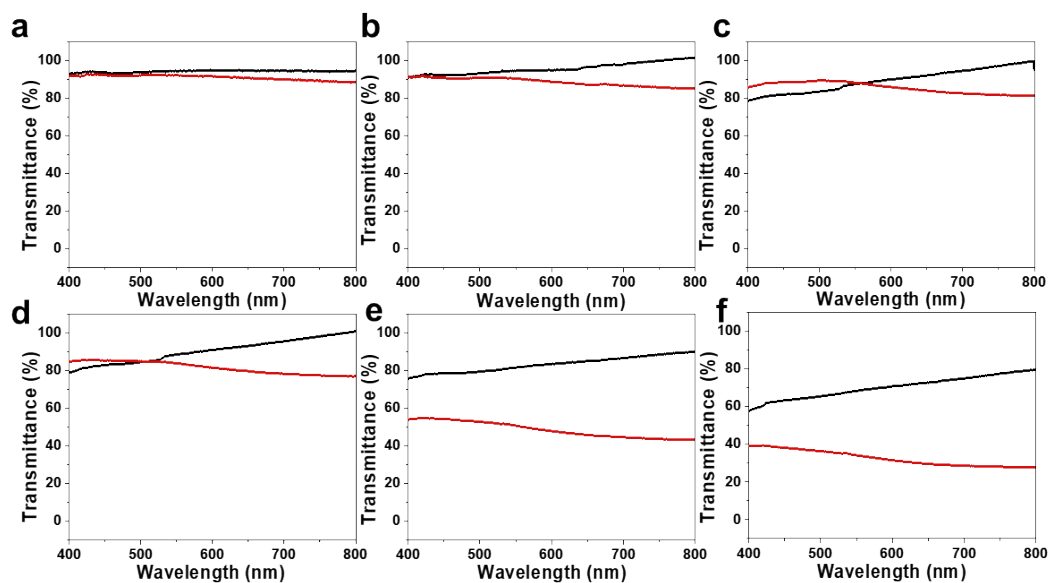
**Figure S4.** Optical pictures of large-scale uniform HMP films prepared on ITO-glass (middle), with blank glass (left) and the drop-casting film (right) as contrast.



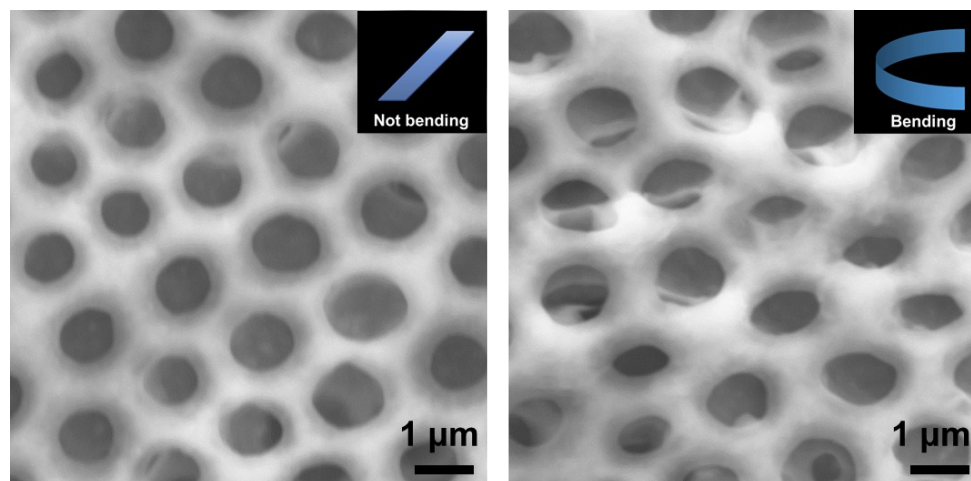
**Figure S5.** SEM images of the DC film (left) and HMP film (right) prepared on the ITO-PET substrates after cyclic voltammogram (CV) tests.



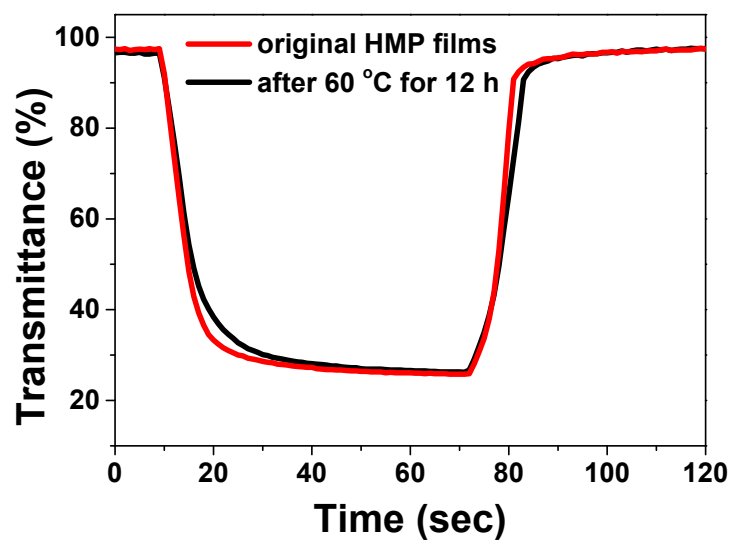
**Figure S6.** Optical transmittance of HMP films with different preparation concentrations applied with different voltages (black: 0 V and red: -1 V). (a) 0.2 mg/mL; (b) 0.4 mg/mL (pore size: 5.95  $\mu\text{m}$ ); (c) 0.6 mg/mL (pore size: 3.87  $\mu\text{m}$ ); (d) 0.8 mg/mL (pore size: 2.70  $\mu\text{m}$ ); (e) 2.0 mg/mL (pore size: 1.92  $\mu\text{m}$ ); (f) 4.0 mg/mL.



**Figure S7.** Optical transmittance of DC films with different preparation concentrations applied with different voltages (black: 0 V and red: -1 V). (a) 0.2 mg/mL; (b) 0.4 mg/mL; (c) 0.6 mg/mL; (d) 0.8 mg/mL; (e) 2.0 mg/mL; (f) 4.0 mg/mL.



**Figure S8.** SEM images of the HMP films in normal state (left) and bending state (right).



**Figure S9.** Thermal stability of the HMP films prepared on the ITO-PET substrate.