Supporting information **Temperature-dependent microstructure of PEDOT/PSS films: insights from morphological, mechanical and electrical analyses**

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4) catch PEDOT/PSS film using copper mesh

Fig. S1 Illustration on preparation of PEDOT/PSS self-standing nanofilm on TEM copper mesh.

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Fig. S2 Energy-dispersive X-ray spectroscopy (EDX) spectra of PEDOT/PSS nanofilm investigated under TEM.



Fig. S3 TG curves of pristine and annealed PEDOT/PSS film.



Fig. S4 Cryo-TEM images of (a) carbon film, (b) PEDOT/PSS nanofilm on carbon and (c) High magnification of (b).

Temperature	Diameters in BF-TEM	Diameters in HAADF-STEM
RT (26 ° C)	33±4 nm	63±12 nm
LT (-177 ° C)	27±9 nm	47±13 nm
HT (100 $^{\circ}$ C)	43±7 nm	52±10 nm



Fig. S5 Microstructure of PEDOT/PSS nanofilm at 150 $^{\circ}$ C. (a) BF-TEM image of PEDOT/PSS nanofilm collected at a thinner place. Inset is the TEM diffraction pattern. (b) HAADF-STEM image of PEDOT/PSS nanofilms collected at a thinner place. (c) HAADF-STEM image of PEDOT/PSS nanofilms collected at a thicker place.