Supporting Information

Solution-processed organometallic quasi-two-dimensional nanosheets as hole buffer layer for organic light-emitting devices

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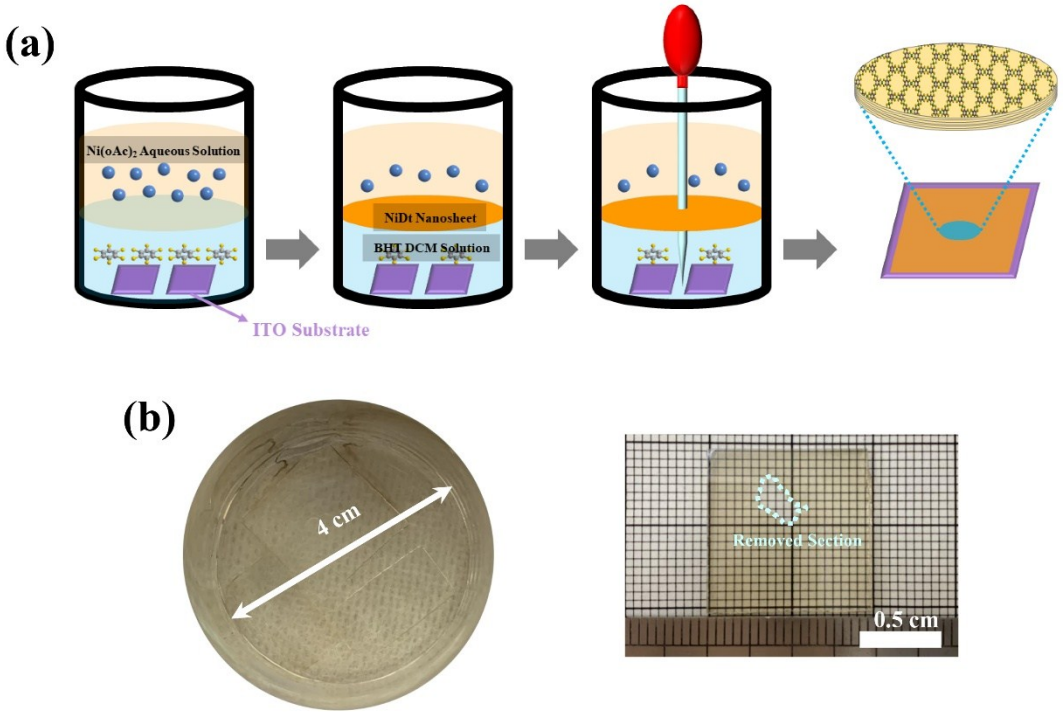

Fig. S1 (a) Schematic diagram for depositing NiDT organic nanosheet on ITO substrate in liquid/liquid interface fabrication process and (b) the obtained NiDT nanosheets on ITO substrate.

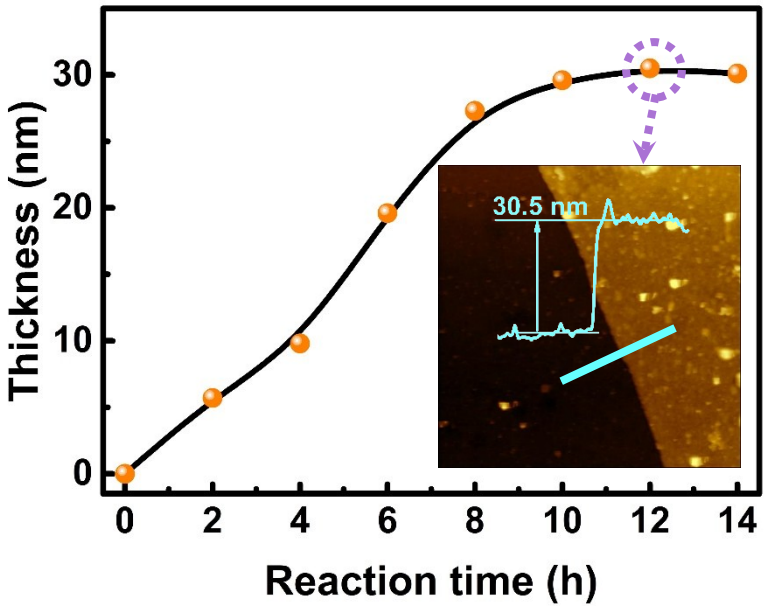

Fig. S2 Thickness of NiDT nanosheets vs. reaction time; the inset is an atomic force micrography image of the NiDT nanosheet obtained with a 12 h reaction.

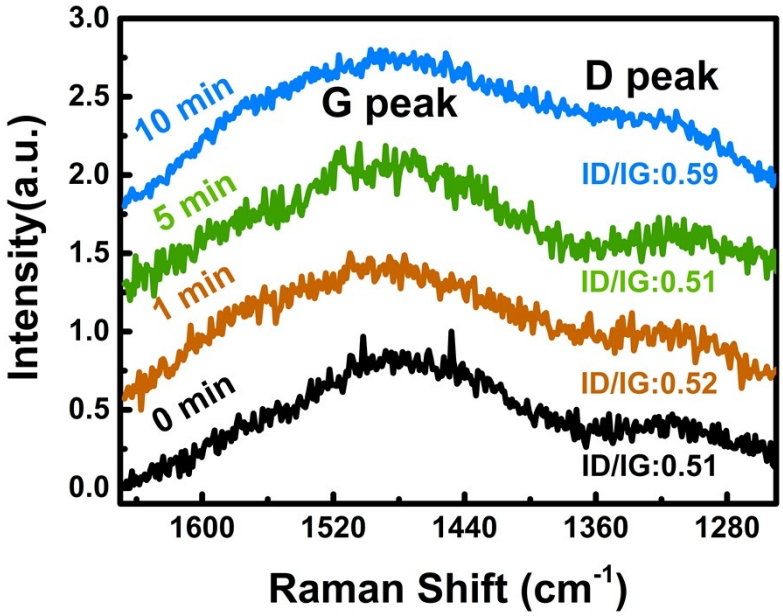

Fig. S3 Raman spectra of NiDT nanosheets after oxygen/plasma treatment

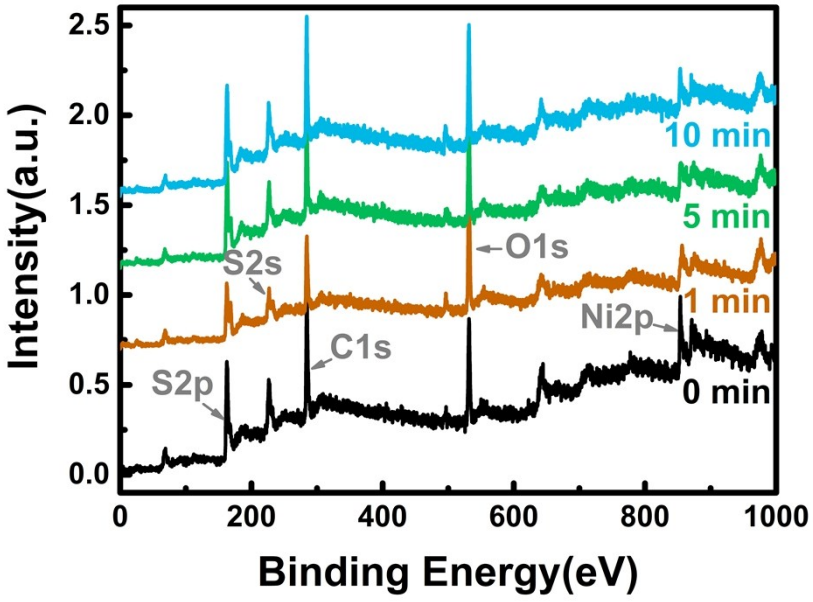

Fig. S4 XPS spectra of NiDT nanosheets after oxygen/plasma treatment

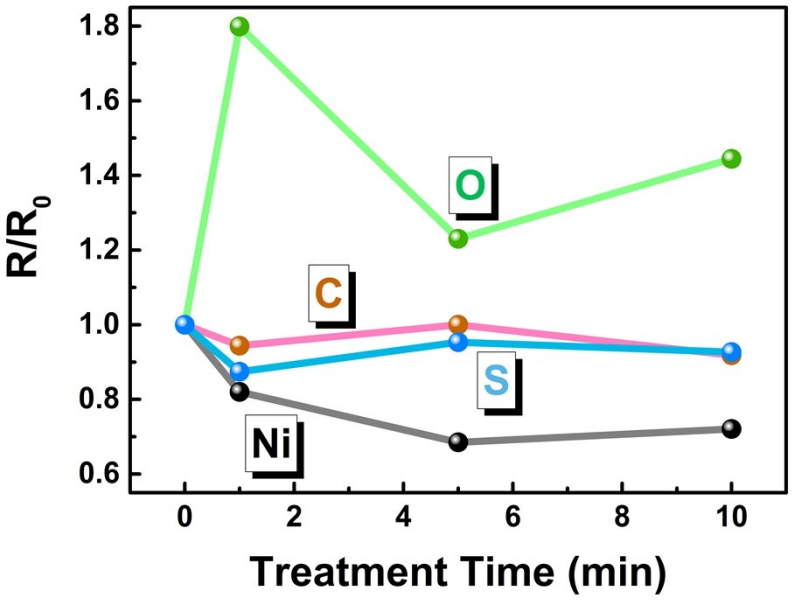

Fig. S5 Normalized Atomic ratio R/R_0 of Ni, C, O and S calculated from XPS spectra of NiDT nanosheets after oxygen/plasma treatment. R_0 represents the atomic ratio of Ni, C, O and S for NiDT nanosheet without oxygen/plasma treatment.

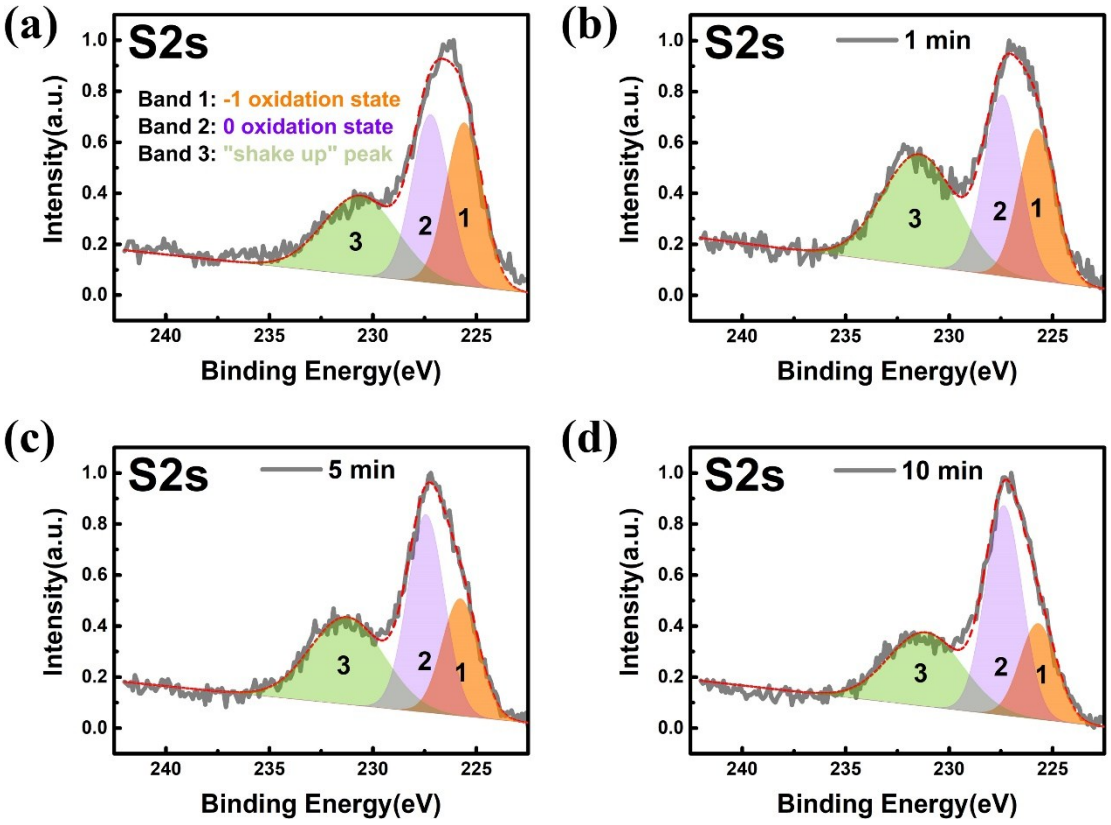

Fig. S6 Deconvolution of S 2s peaks for NiDT nanosheet after oxygen/plasma treatment with (a) 0 min, (b) 1 min, (c) 5 min and (d) 10 min. Band 1 and 2 represents the -1 and 0 oxidation states, respectively, while band 3 is "shake-up" peak.

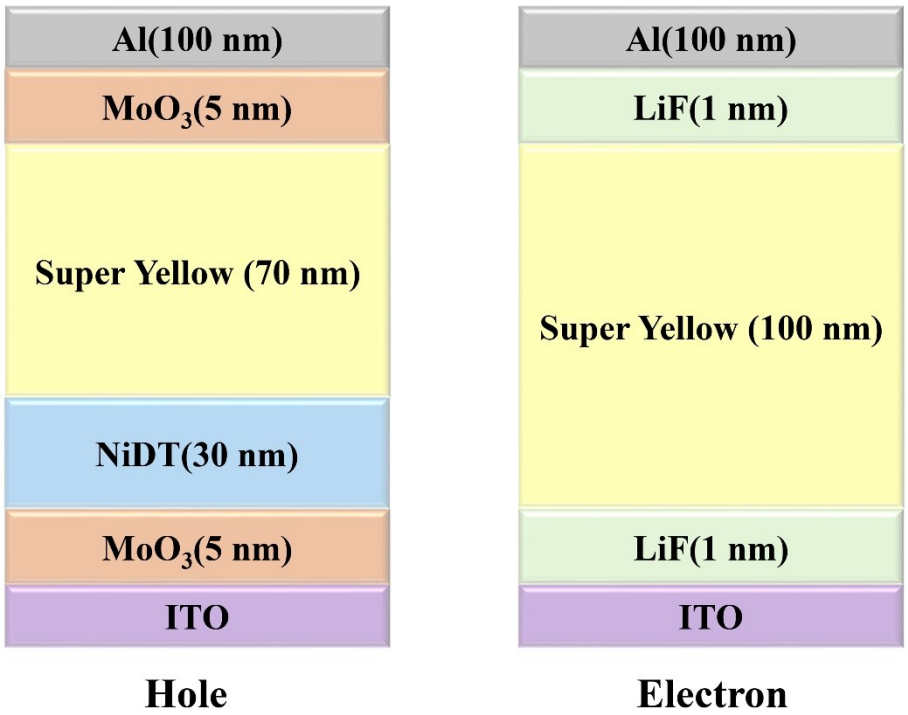

Fig. S7 Device structure used for measuring hole and electron current density of yellow polymer OLEDs.

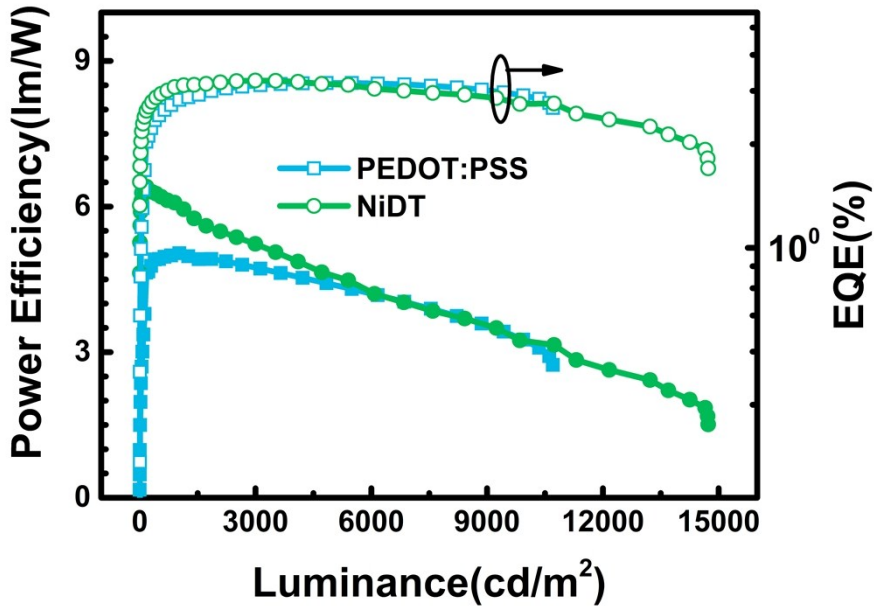

Fig. S8 Power efficiency-luminance-external quantum efficiency (EQE) characteristics of NiDT and PEDOT:PSS devices with Super Yellow.

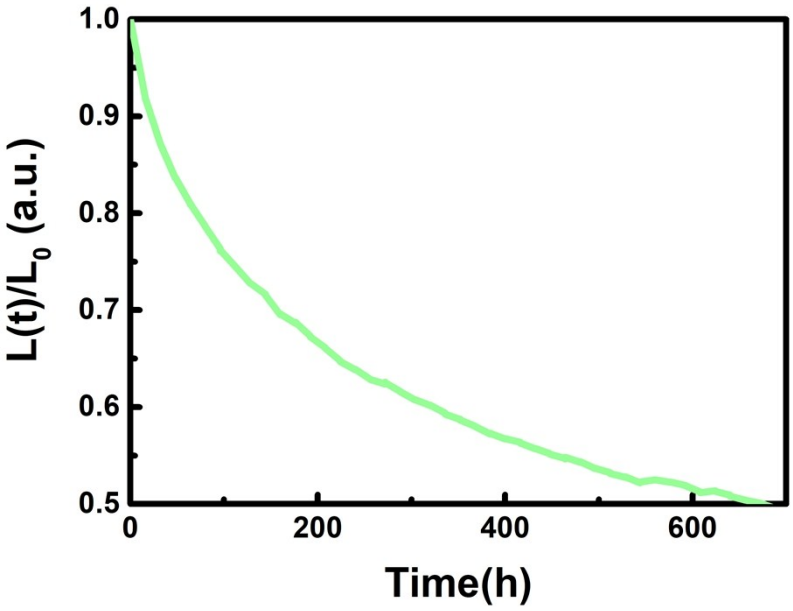

Fig. S9 Normalized luminance degradation $L(t)/L_0$ of the encapsulated NiDT employing $Ir(ppy)_3$ as emitter. L_0 is the luminance of 1000 cd/m^2. The device structures are ITO/NiDT nanosheet/ CBP:10 wt% $Ir(ppy)_3$/TPBi/LiF/Al.