# Supplementary Information for

## Utilization of “thiol-ene” photo cross-linkable hole-transporting polymer for solution-processed multilayer organic light-emitting diode

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**Fig. S1**. $^{1}$H-NMR spectrum of compound **2**.

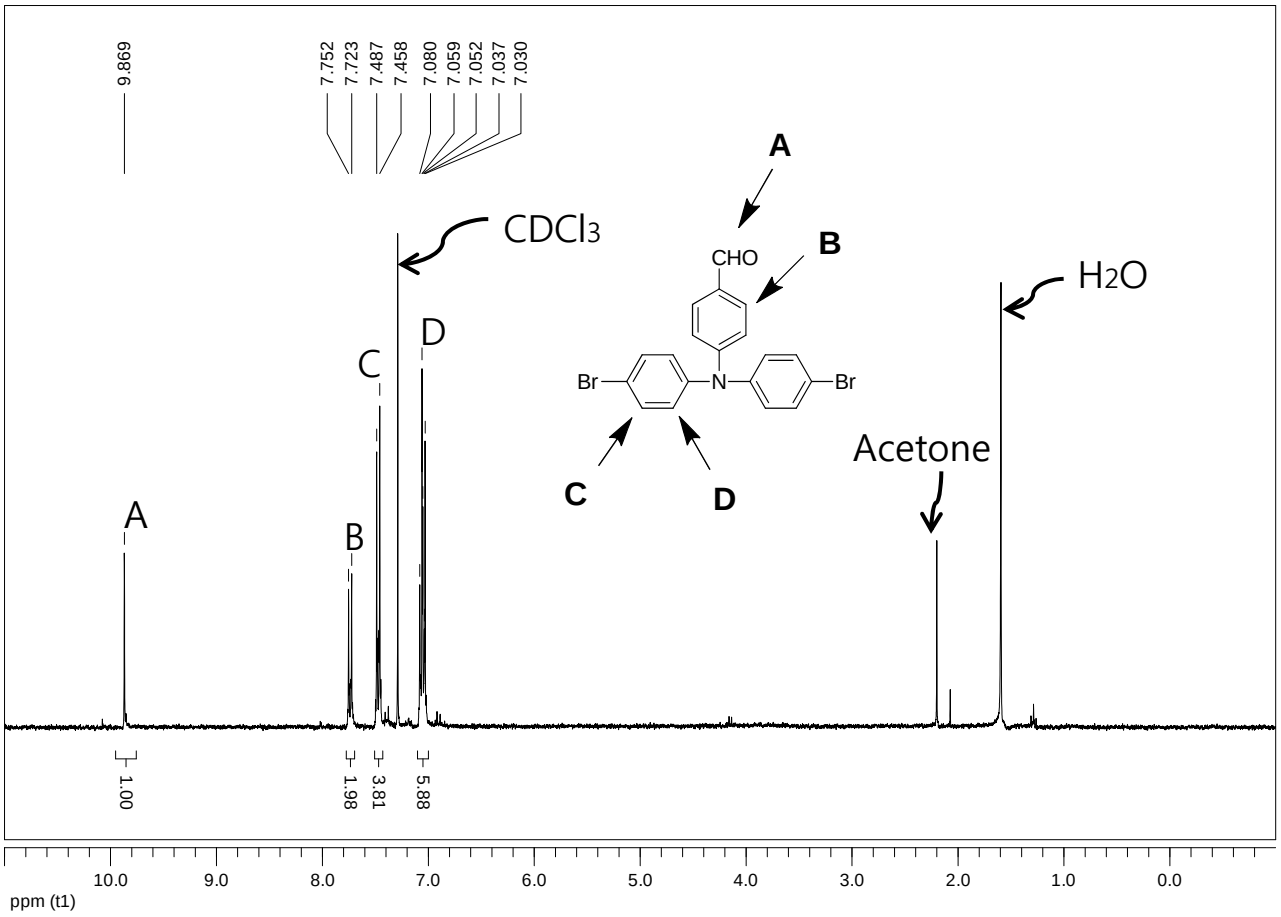


**Fig. S2**. $^{1}$H-NMR spectrum of compound **3**.

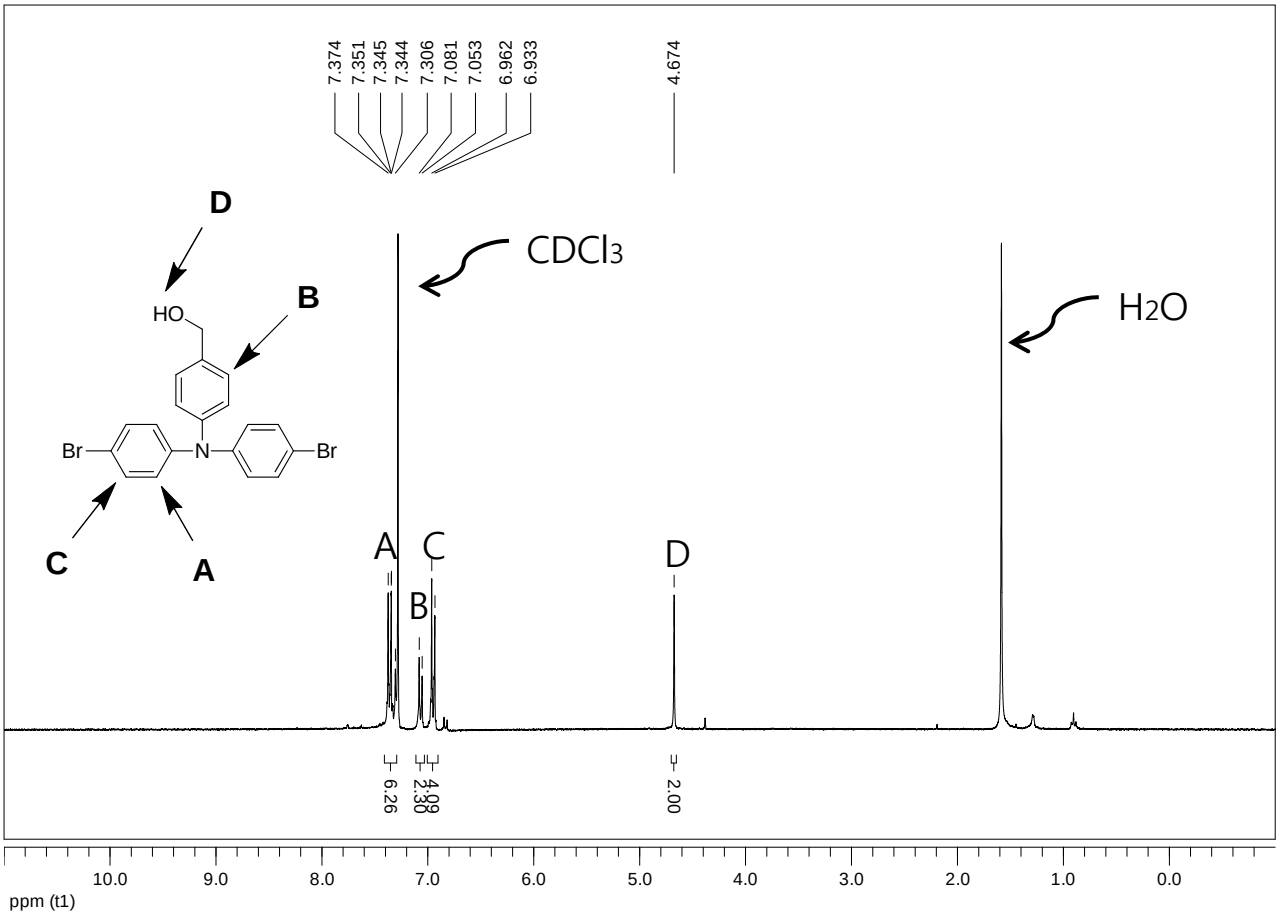


**Fig. S3**. $^{1}$H-NMR spectrum of compound **4**.

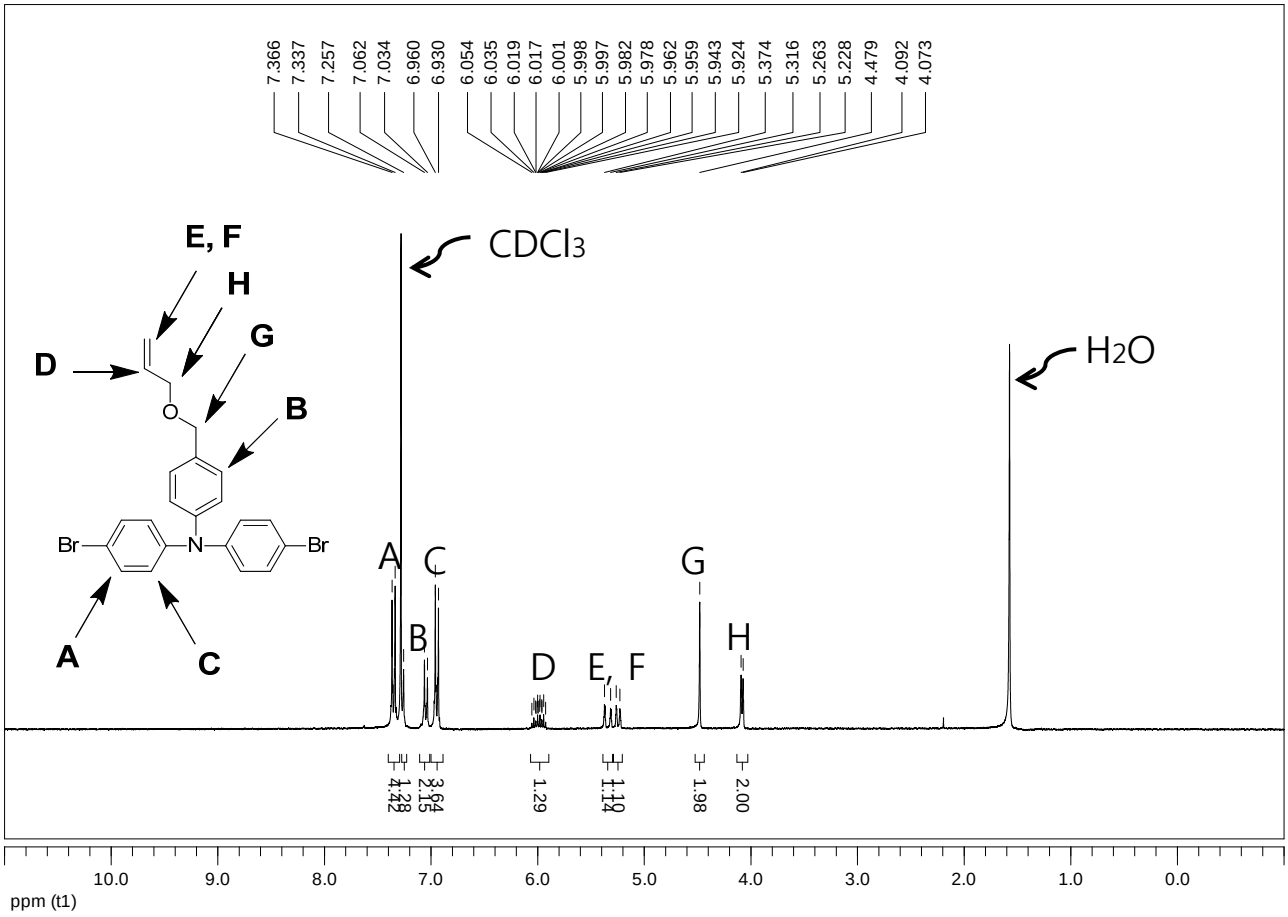


**Fig. S4**. $^{1}$H-NMR spectrum of compound **5**.

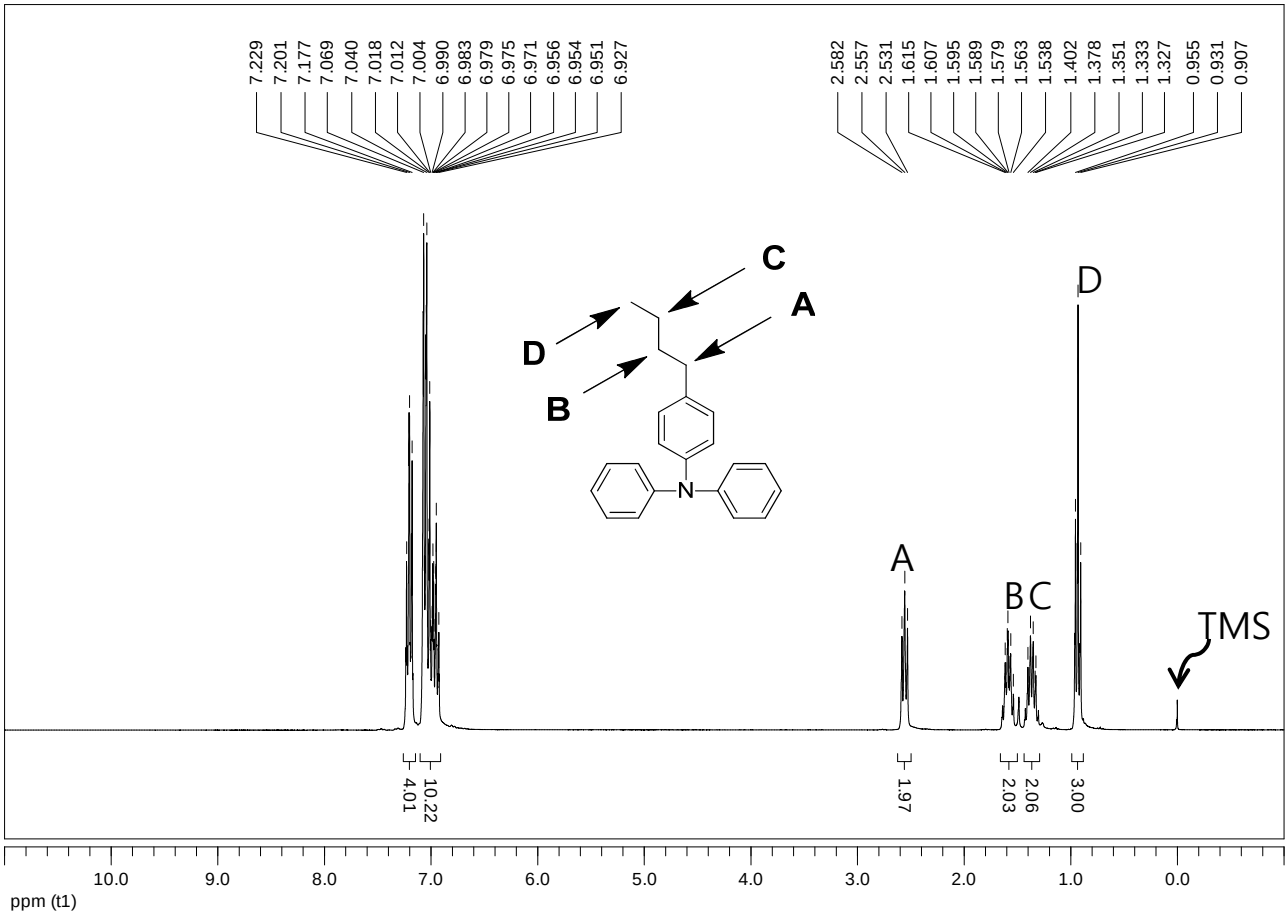


**Fig. S5**. $^{1}$H-NMR spectrum of compound **6**.

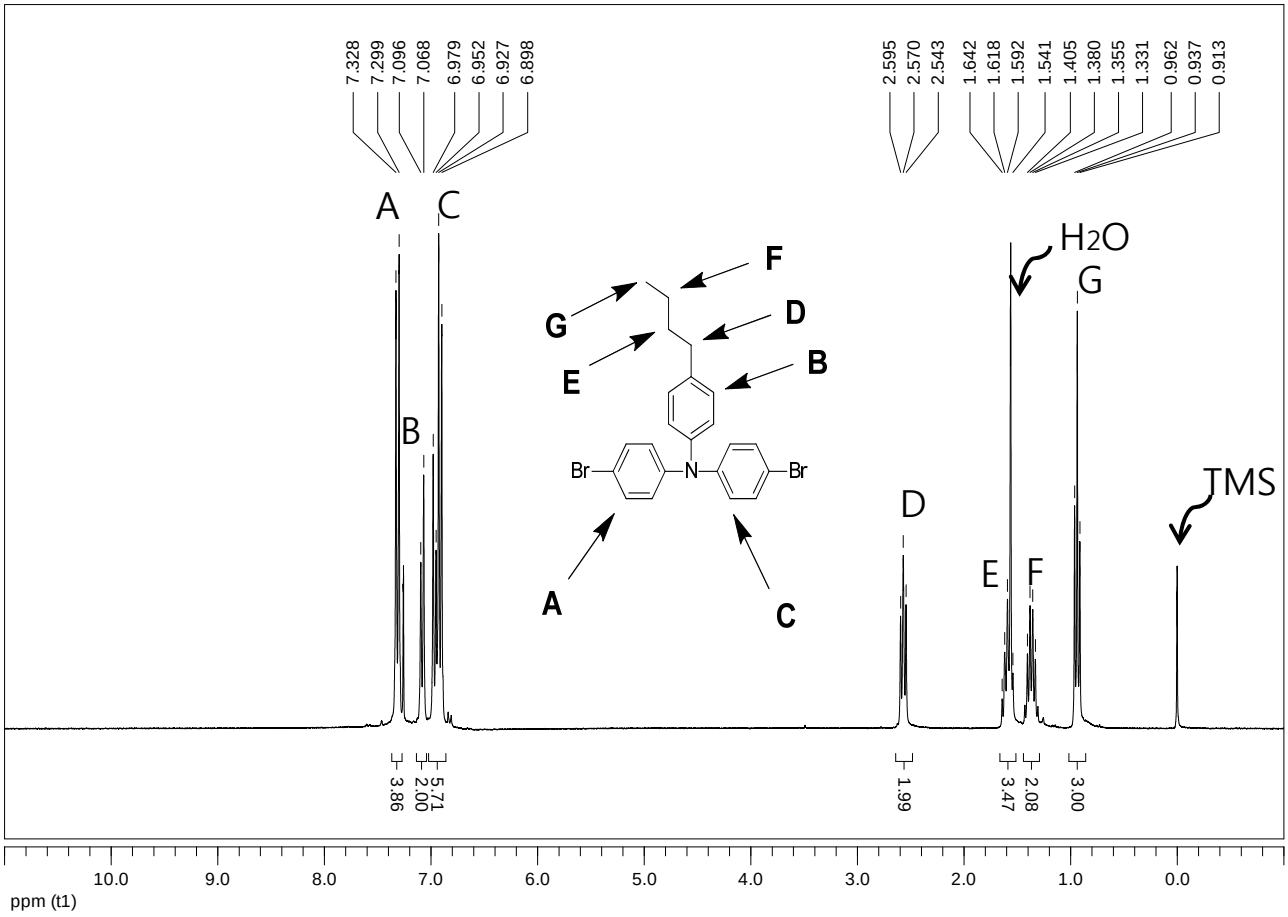


**Fig. S6**. $^{13}$C-NMR spectrum of compound **4**.

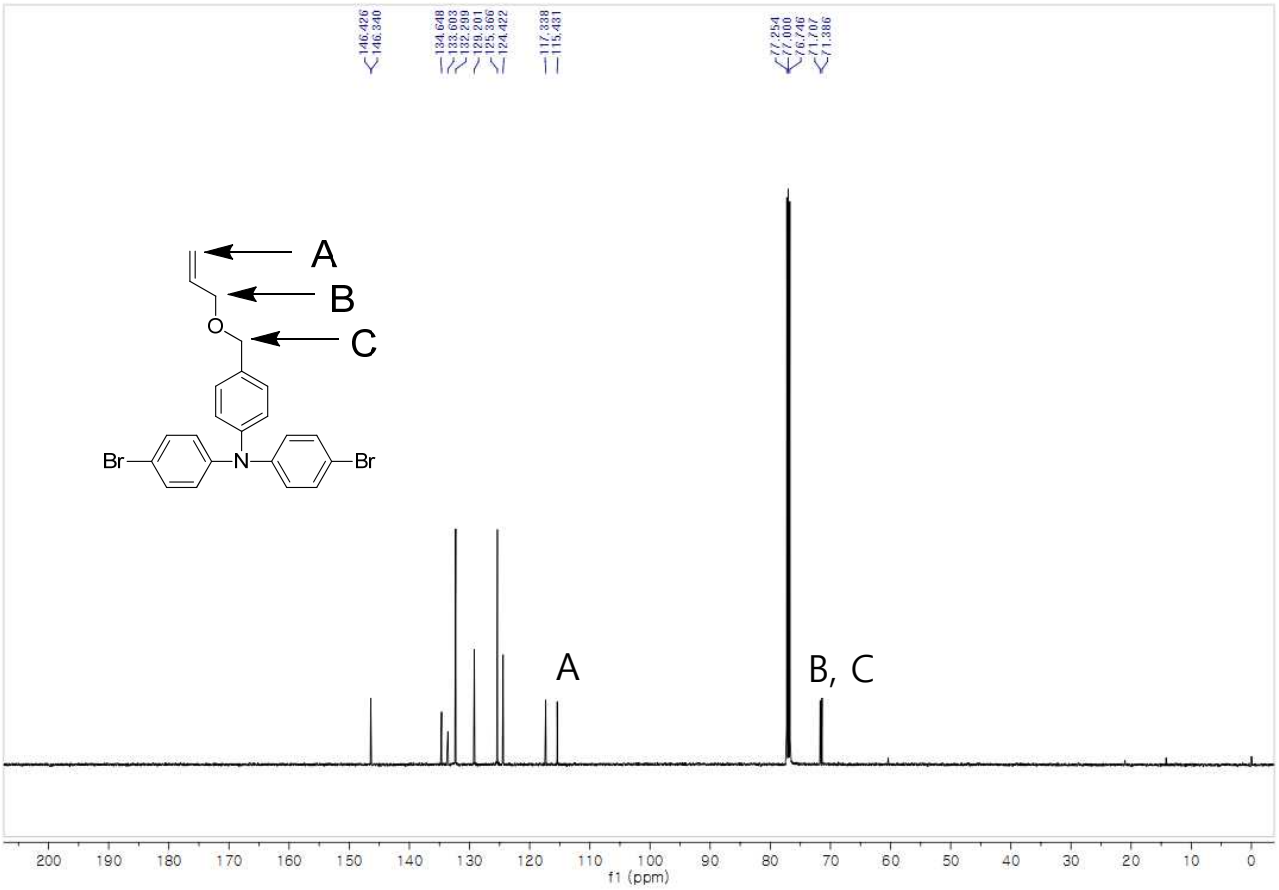


**Fig. S7**. $^{13}$C-NMR spectrum of compound **6**.

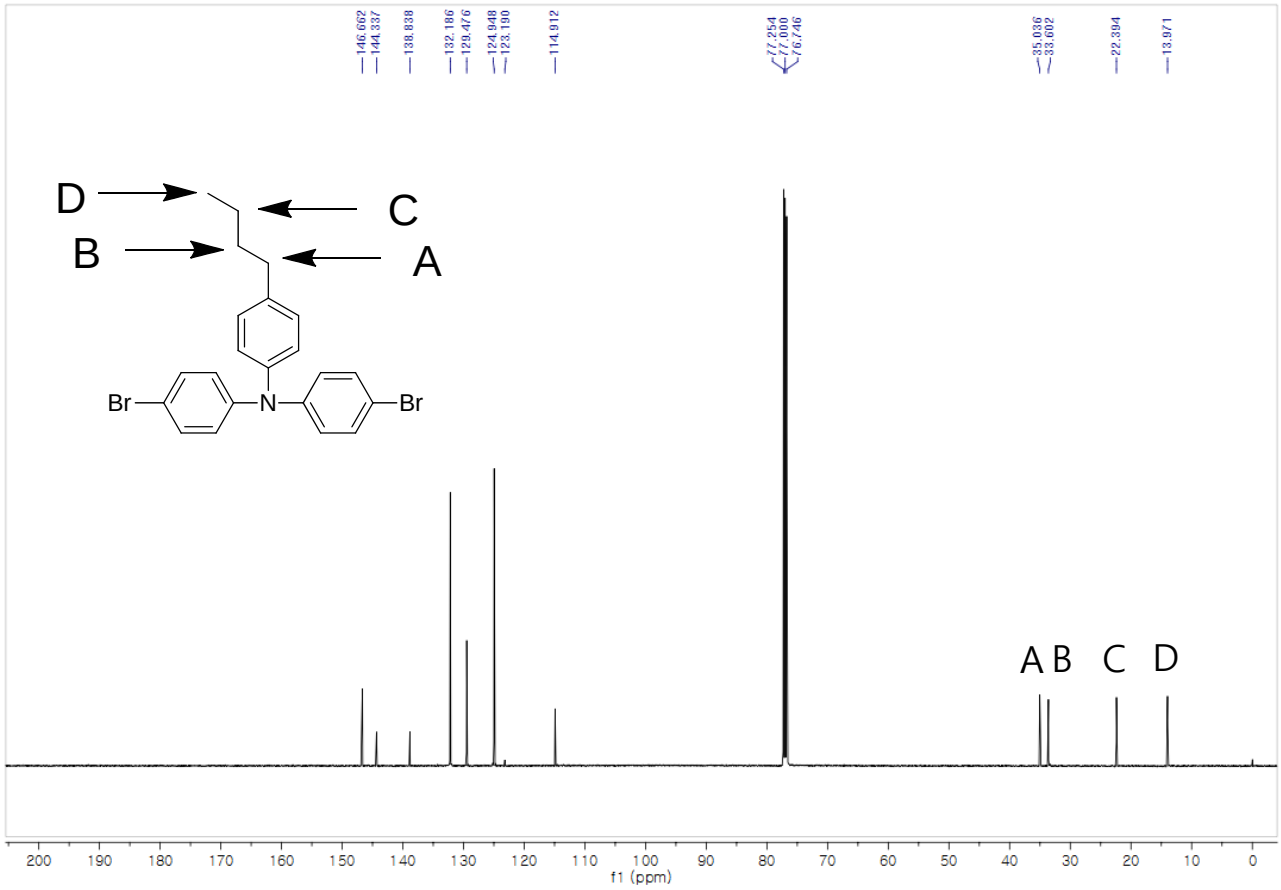


**Fig. S8**. TGA thermogram of Allyl-TFB.

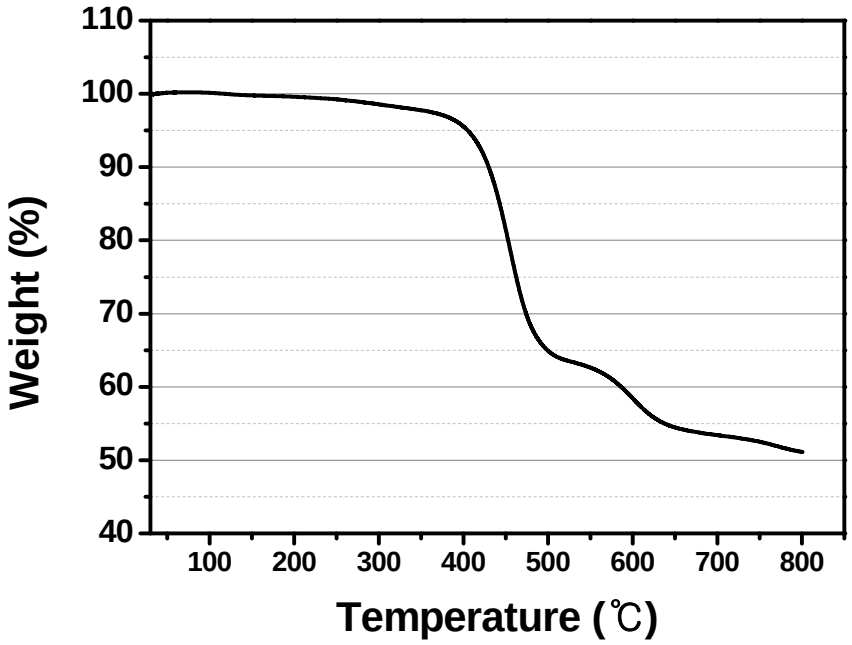


**Fig. S9**. DSC thermogram of Allyl-TFB.

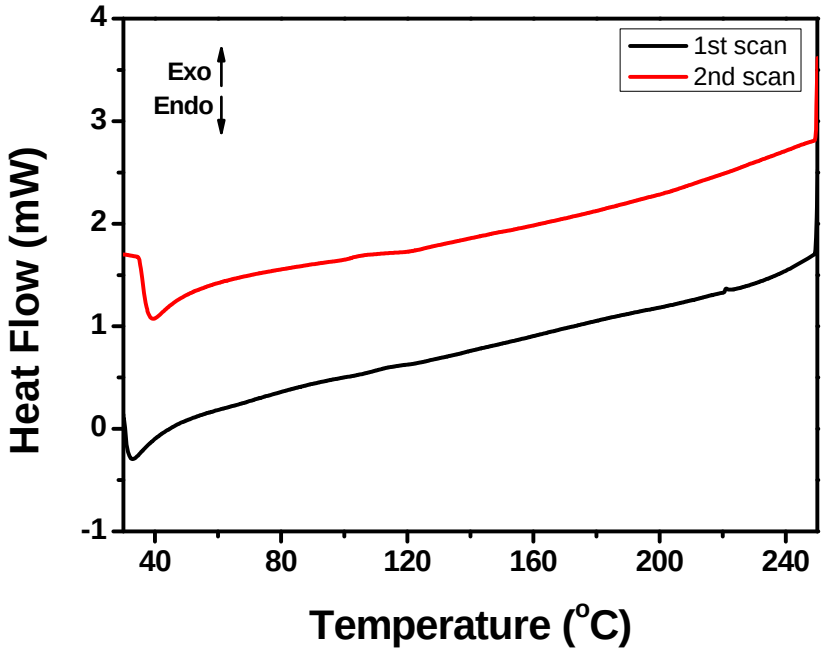
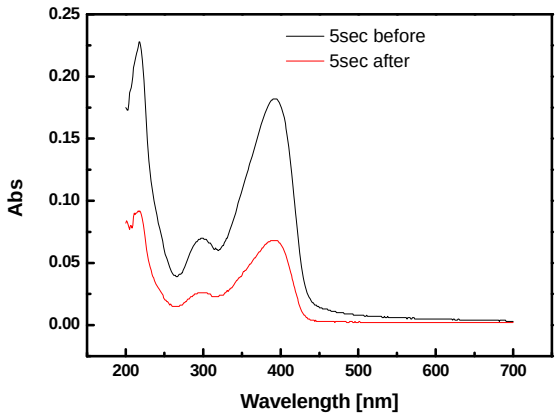
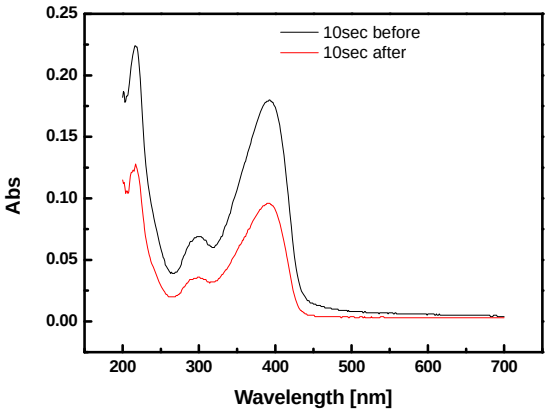


**Fig. S10**. UV-Vis. absorption spectra of photo cross-linked Allyl-TFB films before and after solvent rinsing with different UV irradiation times.

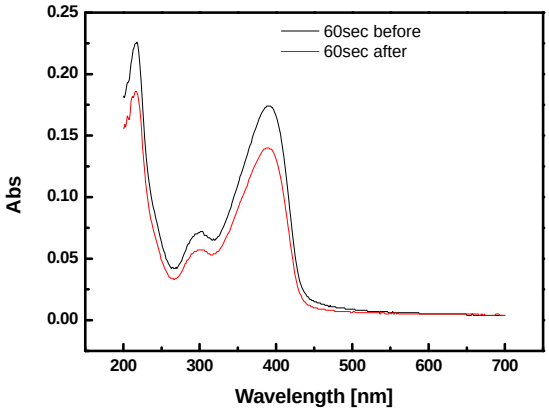
(a) UV irradiation for 5 sec.



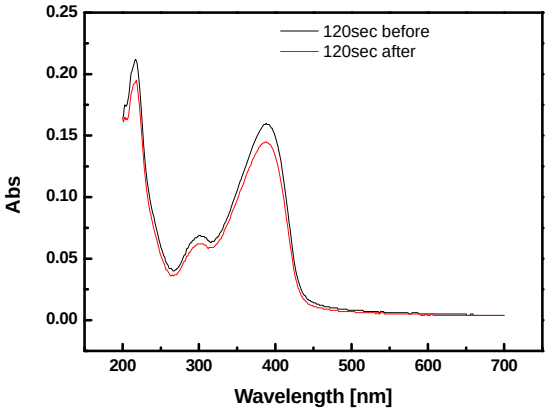

(b) UV irradiation for 10 sec.




(c) UV irradiation for 60 sec.




(d) UV irradiation for 120 sec.




(e) UV irradiation for 240 sec.

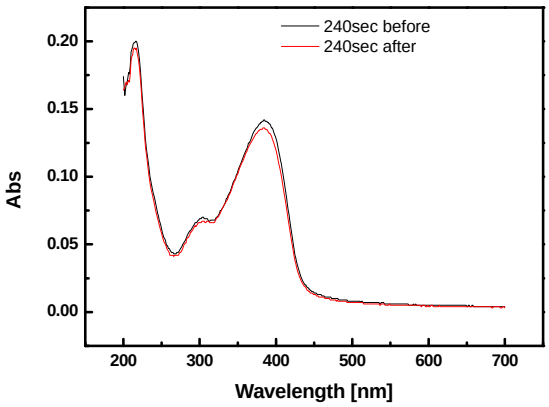
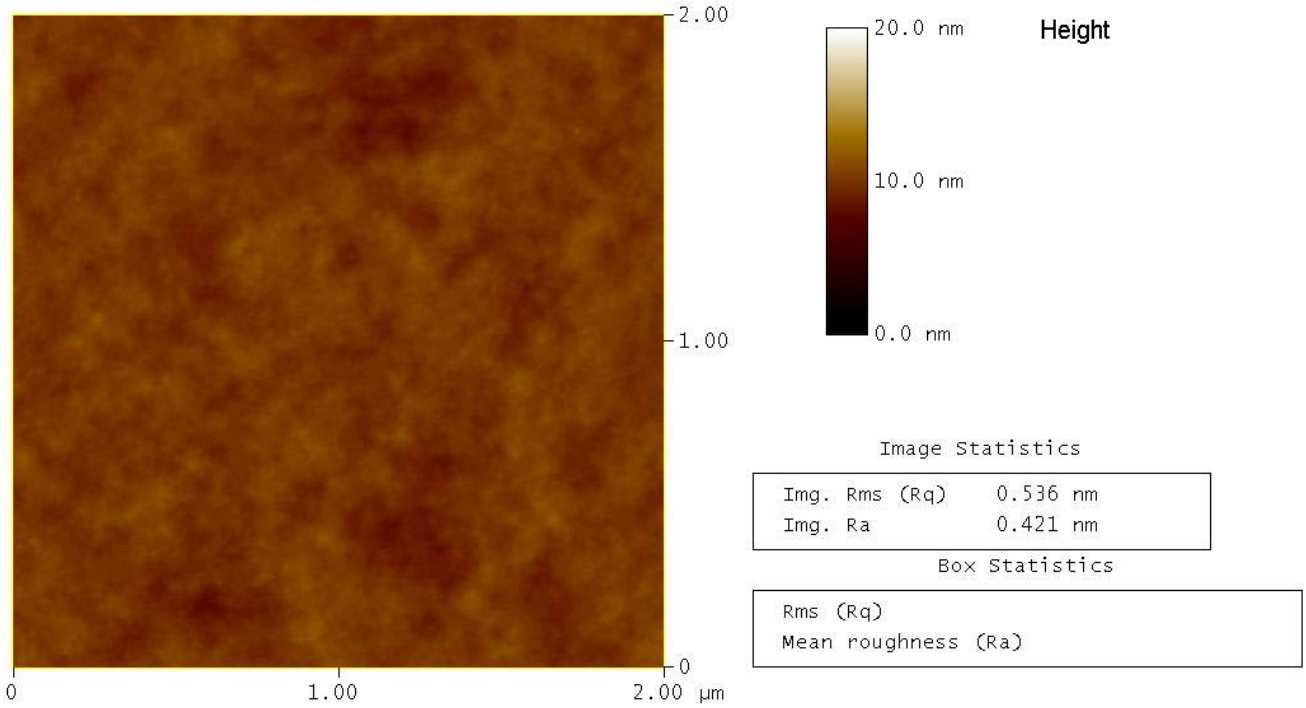


**Fig. S11**. Atomic force microscopic images of photo cross-linked HTL films with different UV irradiation times.

(a) UV irradiation for 30 sec.




(b) UV irradiation for 180 sec.

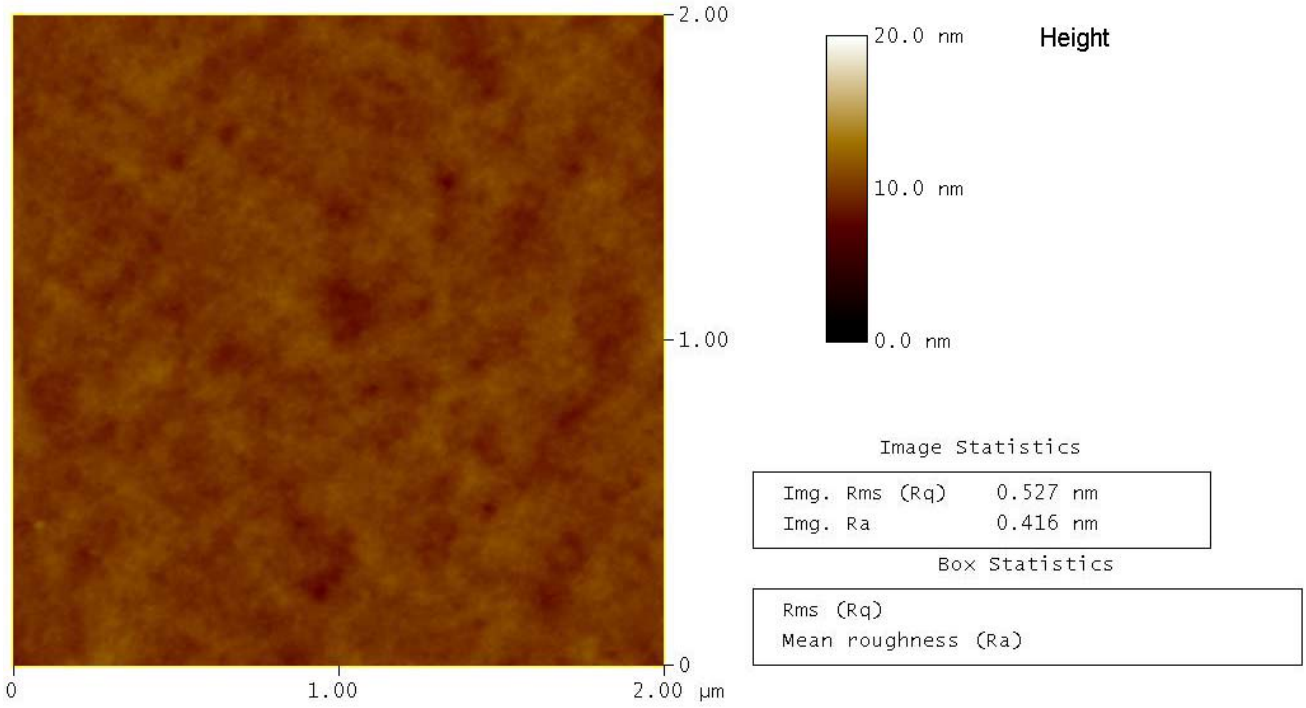
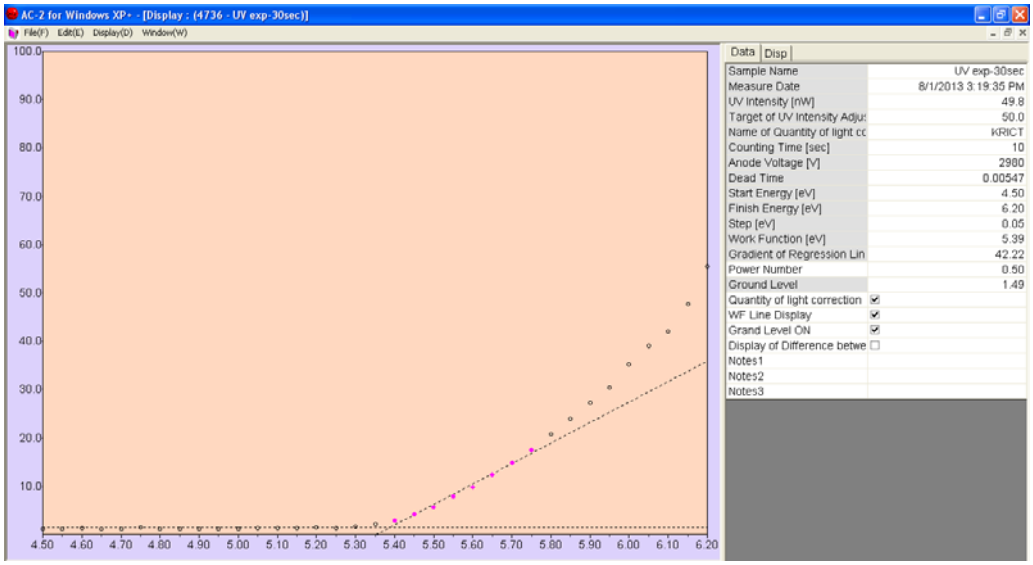


**Fig. S12**. Atmospheric photoelectron spectroscopy (Riken AC-2) measurement results of photo cross-linked HTL films with different UV irradiation times.

(a) UV irradiation for 30 sec.




(b) UV irradiation for 180 sec.

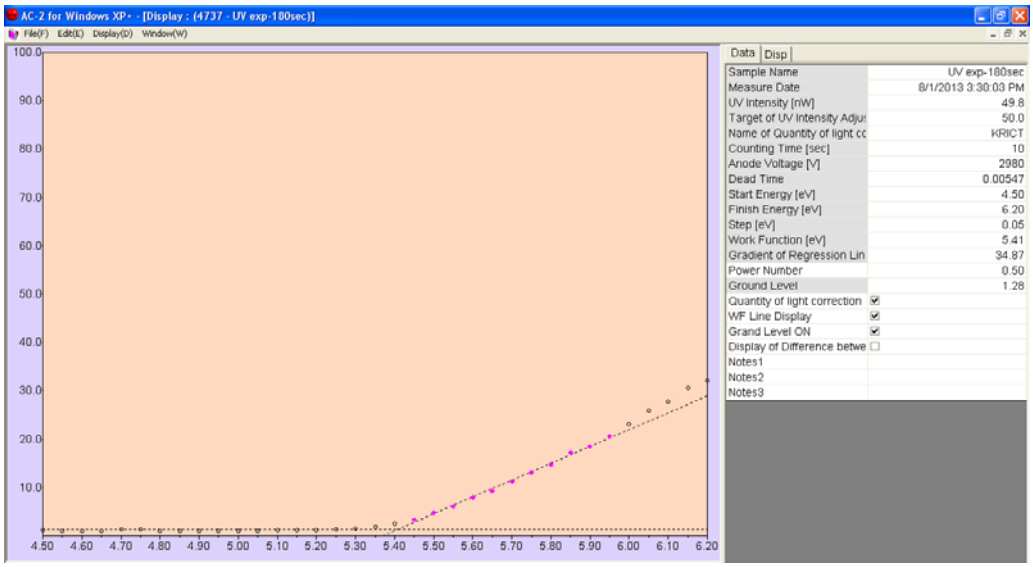


**Fig. S13**. Current density(J)-electric field(F) characteristics of hole-only devices of photo cross-linked HTL films with different UV irradiation times. [ITO / PEDOT:PSS / cross-linked Allyl-TFB / Au].