

# **Supporting Information**

# A Highly Sensitive Thin-Film Field-Effect Transistor Sensor for Ammonia with the DPP-Bithiophene Conjugated Polymer Entailing Thermally Cleavable *tert*-Butoxy Groups in the Side Chains

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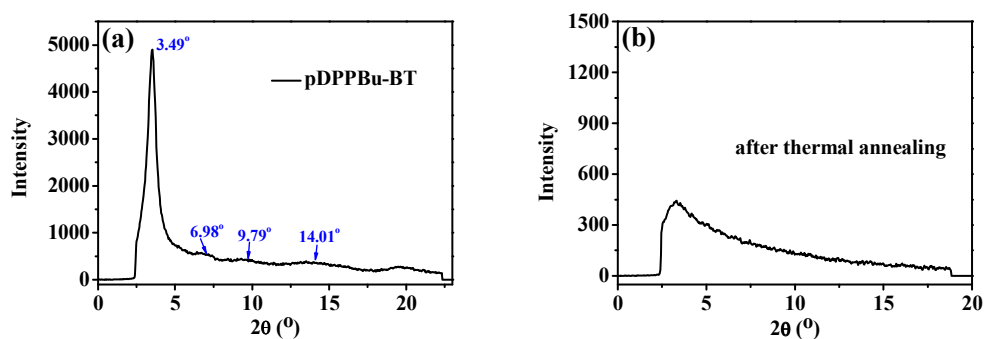
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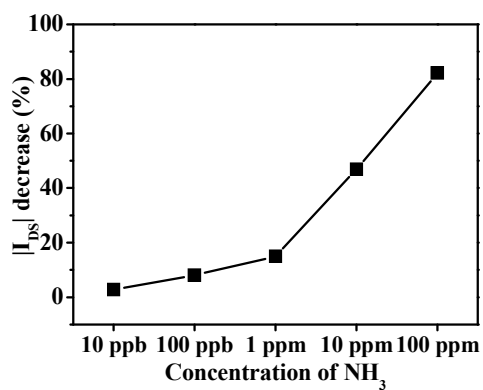
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## 1. GIXRD patterns of thin films of pDPPBu-BT



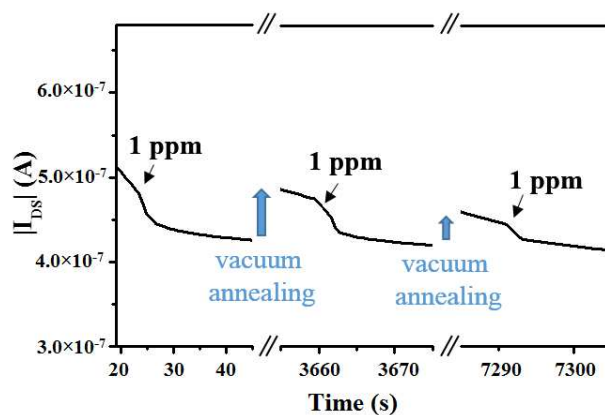
**Figure S1.** GIXRD patterns of thin films of pDPPBu-BT before (a) and after (b) thermal annealing at 240 °C for 30 min.

## 2. Variation of $I_{DS}$ upon exposure to different concentrations of ammonia



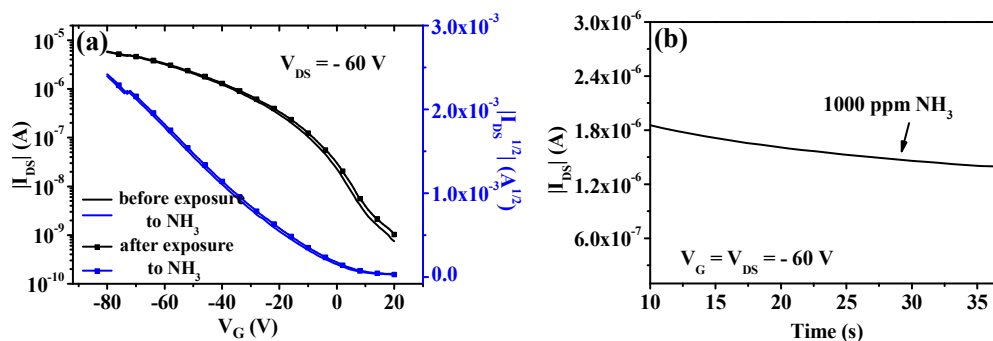
**Figure S2.** Variation of  $I_{DS}$  for FET with pDPPCOOH-BT after exposure to different concentrations of ammonia (10 ppb-100 ppm).

### 3. Reusability of the FET sensor for ammonia



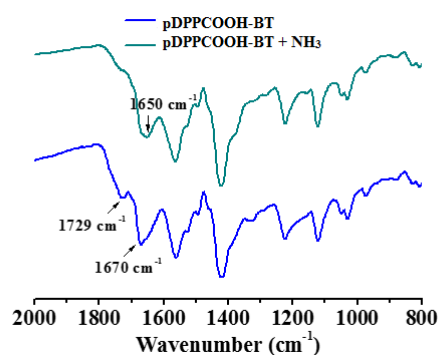
**Figure S3.** The variation of  $I_{DS}$  after exposure to ammonia and the reusability of this FET sensor for ammonia; the FET after exposure to ammonia was annealed at 80°C for 1.0 h under vacuum, followed by exposure to ammonia again.

### 4. Transfer characteristics for FET of pDPPBu-BT before and after exposure to ammonia and the variation of $I_{DS}$ vs time after exposure to ammonia (1000 ppm)



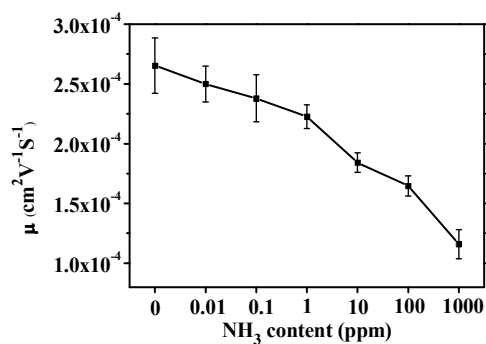
**Figure S4.** (a) Transfer characteristics for FET of pDPPBu-BT before and after exposure to ammonia (1000 ppm) and (b) variation of  $I_{DS}$  vs time for FET of pDPPBu-BT after exposure to ammonia (1000 ppm).

## 5. Variation of FT-IR spectra of pDPPCOOH-BT before and after exposure to ammonia



**FigureS5.** FT-IR spectra of pDPPCOOH-BT, which was obtained from pDPPBu-BT after thermal annealing at 240 °C for 30 min. before and after exposure to ammonia.

## 6. Variation of hole mobility upon exposure to different concentrations of ammonia



**Figure S6.** Variation of hole mobility upon exposure to different concentrations of ammonia.

# 7. $^1\text{H}$ NMR and $^{13}\text{C}$ NMR spectra

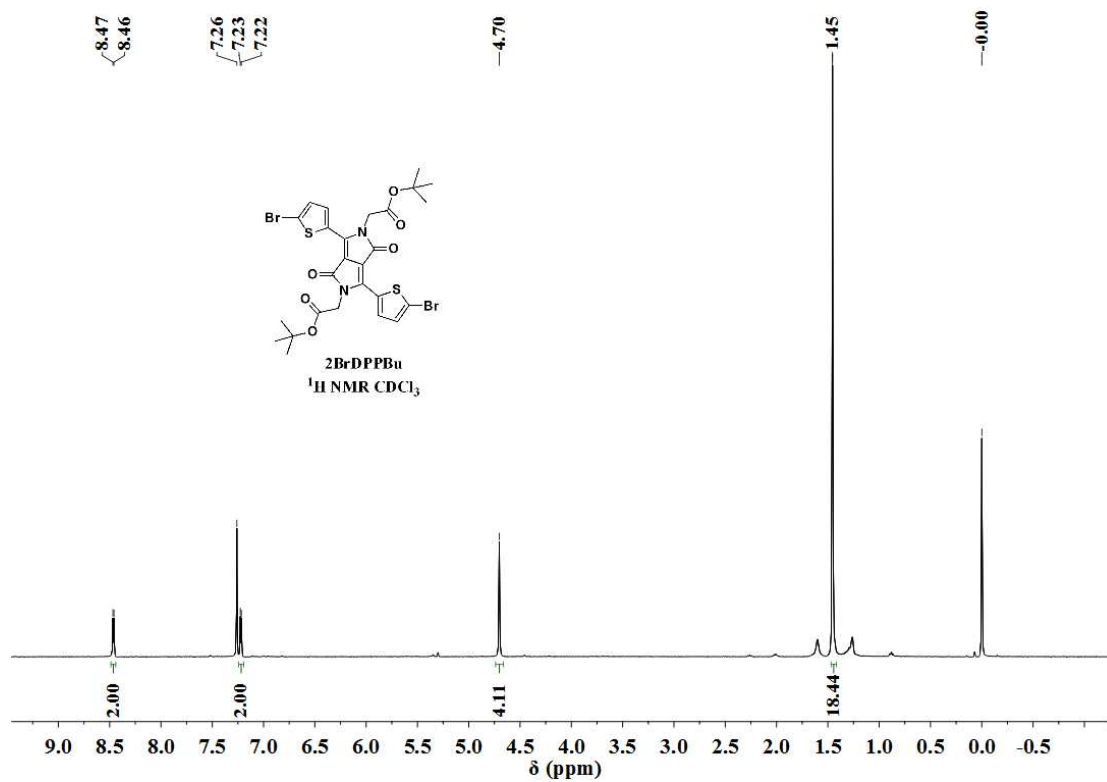


Figure S7.  $^1\text{H}$  NMR of 2BrDPPBu.

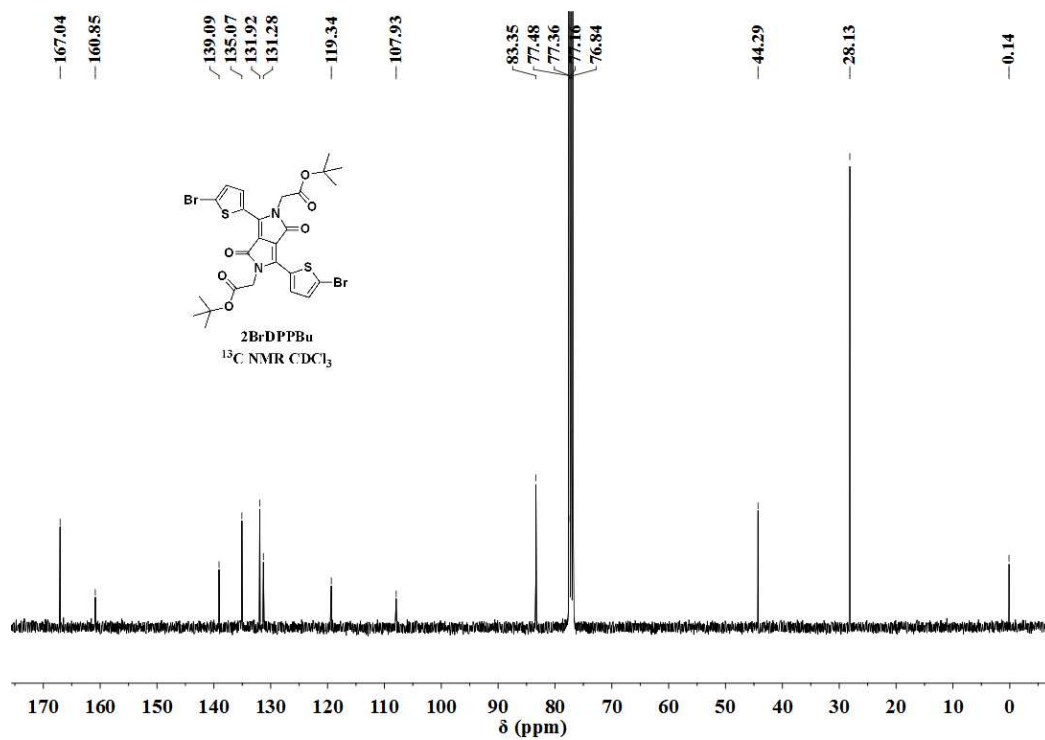


Figure S8.  $^{13}\text{C}$  NMR of 2BrDPPBu.

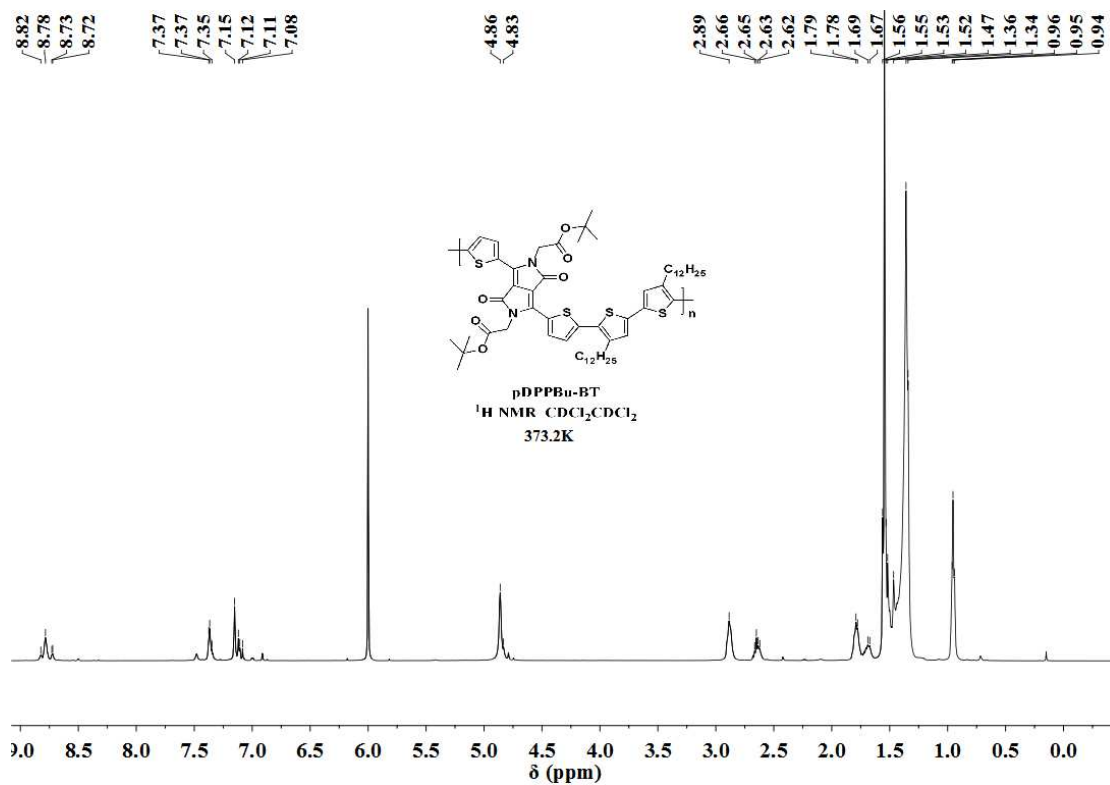
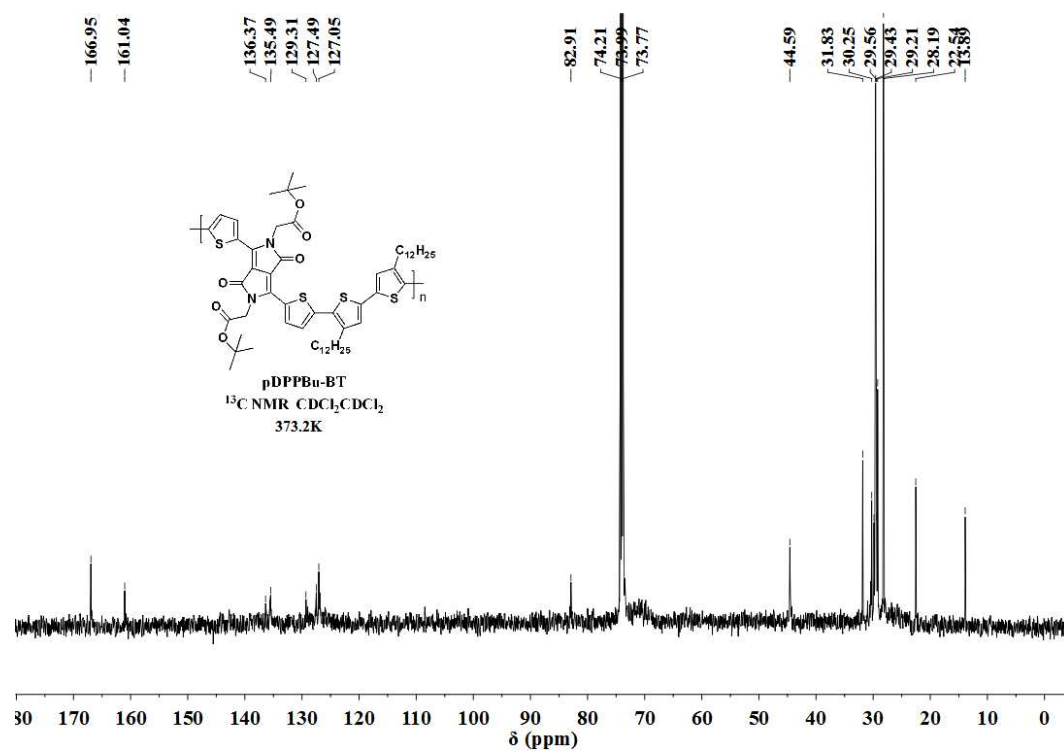


Figure S9.  $^1\text{H}$  NMR of pDPPBu-BT



**Figure S10.**  $^{13}\text{C}$  NMR of pDPPBu-BT.