

## **Supplementary Section**

Fig. S1 NMR of PPE ploymer.



Fig. S2 AFM images of PPE film before (left) and after (right) exposure to DNT vapors for 30 min.



Fig. S3 SEM images of PPE film before (left) and after (right) exposure to DNT vapors for 30 min.



**Fig. S4** AFM images of the PPE film on the DFB grating with an etching depth of 400nm. It shows that the PPE film is elongated to fill the groove and the surface appearance is very uneven.