

Supporting Information:

Electrical Characteristics of the Junction Between PEDOT:PSS and Thiophene-Functionalized Silicon Microwires

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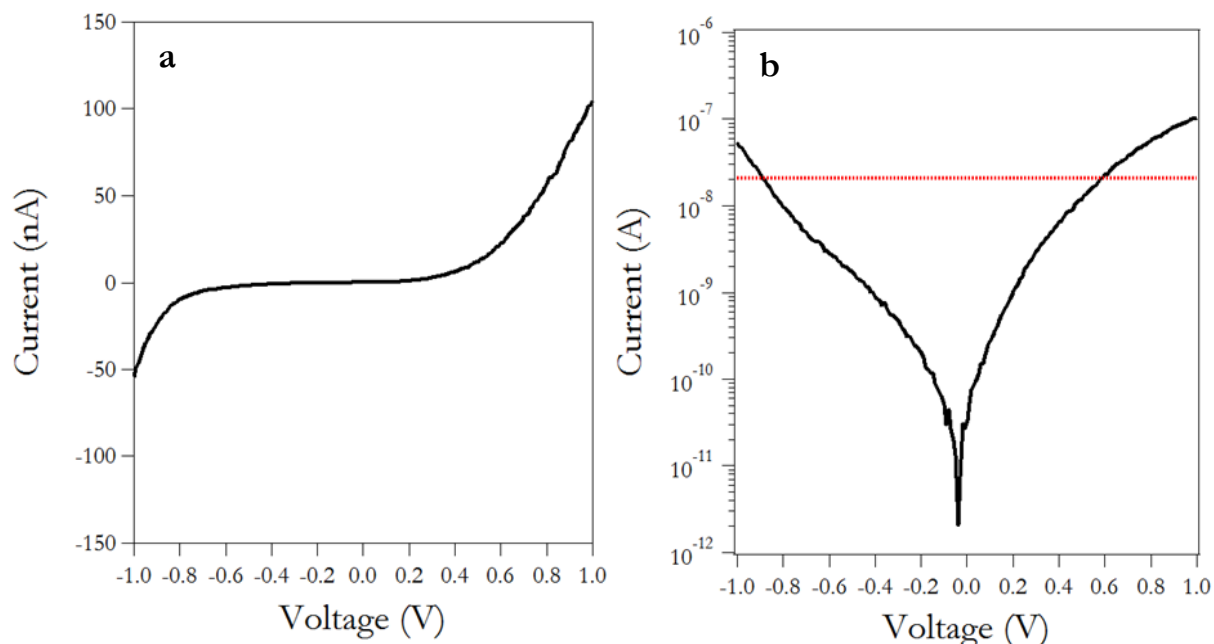


Figure S1: a) Large bias (-1 to 1V) of native oxide without the presence of thiophene n-Si/PEDOT:PSS junction. Under low bias conditions (-100 to 100 mV) the response was ohmic but extremely resistive. b) Semi-log plot of the oxide junction indicating the iR loss at the intersection of the expected light-limited current. The iR loss in n-Si/PEDOT:PSS junction with native oxide at the interface was well over 500 mV and is expected to limit the current flow in the system.

Table S1: Ratios of silicon oxide peak to silicon bulk peak in Si 2p spectrum. Standard deviation for all samples was 1%. Reaction time of 0 is a methyl terminated sample for comparison.

Reaction Time (min)	No Backfill - Fresh	No Backfill - 1 month ambient	Backfill - Fresh	Backfill - 1 month Ambient
0	-	-	7.45	8.57
30	4.03	7.42	4.29	10.72
60	7.93	12.47	4.53	7.07
120	7.15	5.39	5.13	6.65

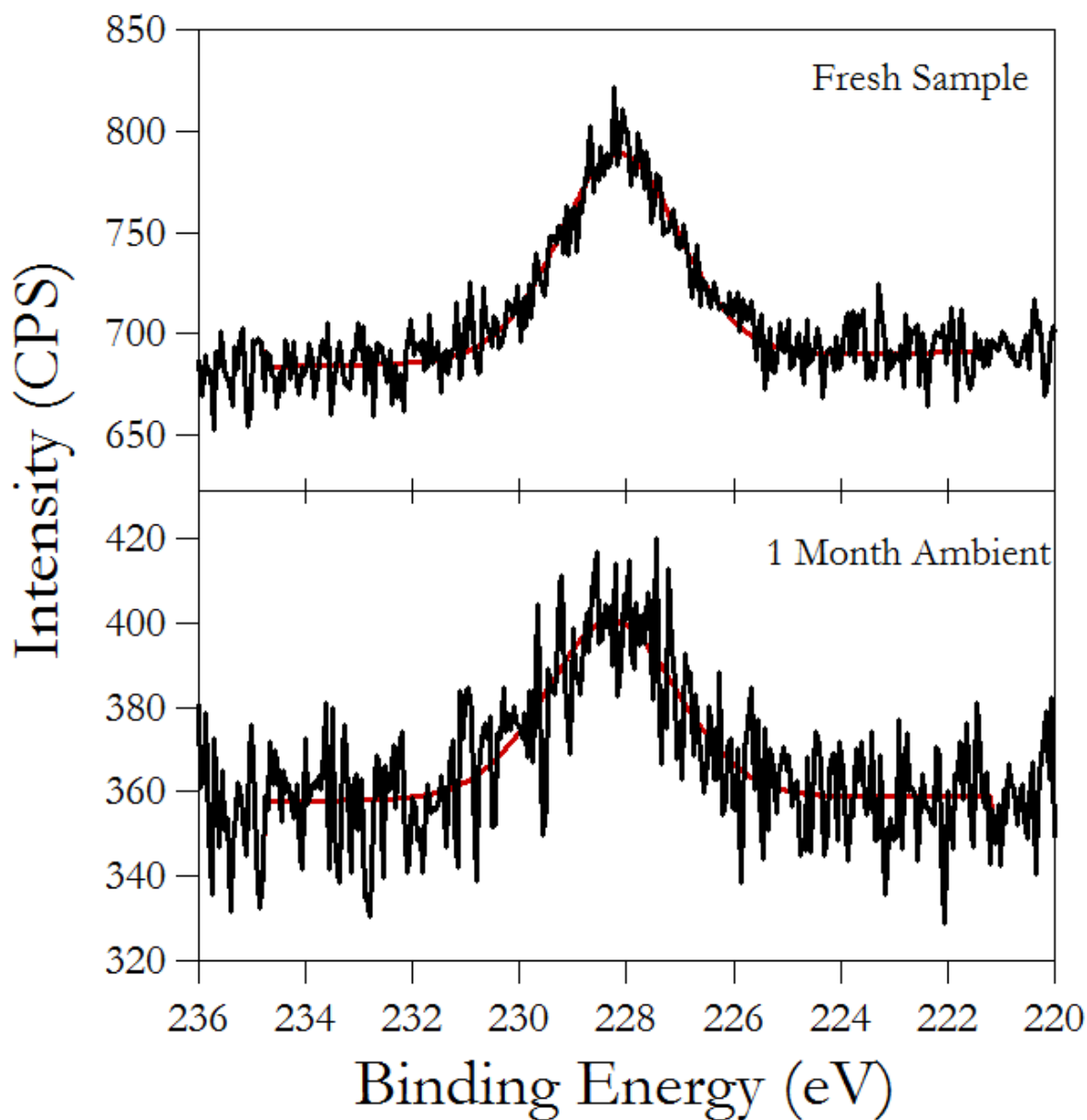


Figure S2: n – Si microwire sample that had been functionalized 60 min in thienyllithium solution. After 1 month of exposure to ambient conditions, the S 2s peak indicative of thiophene present on the surface was still present and no shifting or broadening of the signal that may indicate a chemical change to the group from oxidation was observed. The ratio of the S 2s to Si 2p bulk was 9% while the exposed samples after 1 month had a ratio of 7%.

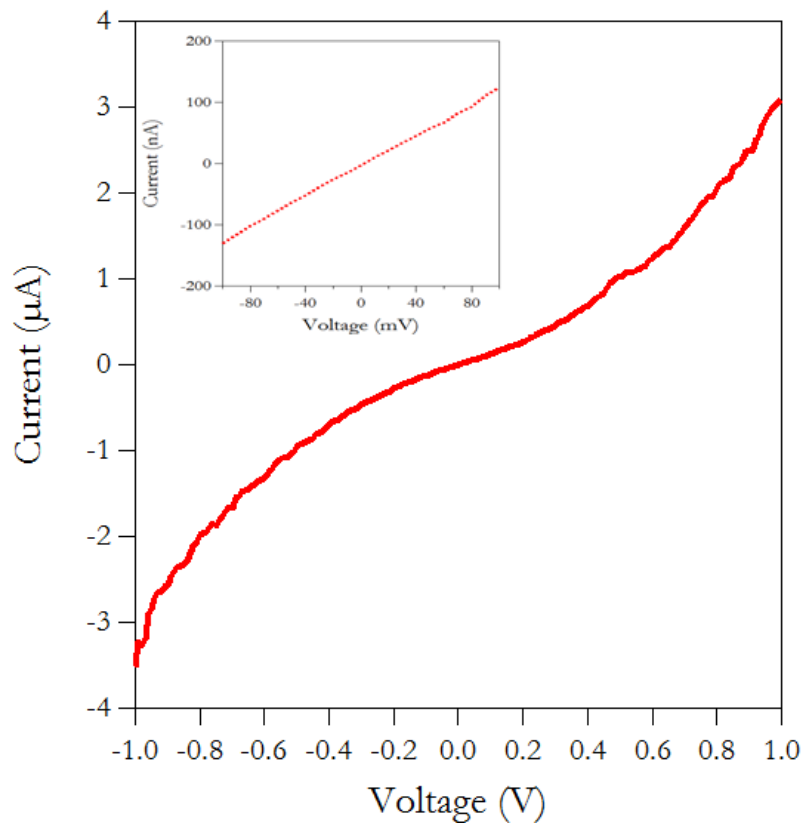


Figure S3: Thiophene functionalized (30 min) p-type wire/ PEDOT:PSS junction characteristics. Non – ohmic behaviour is observed over large bias regions, however over the low bias region (inset), ohmic behaviour is observed.

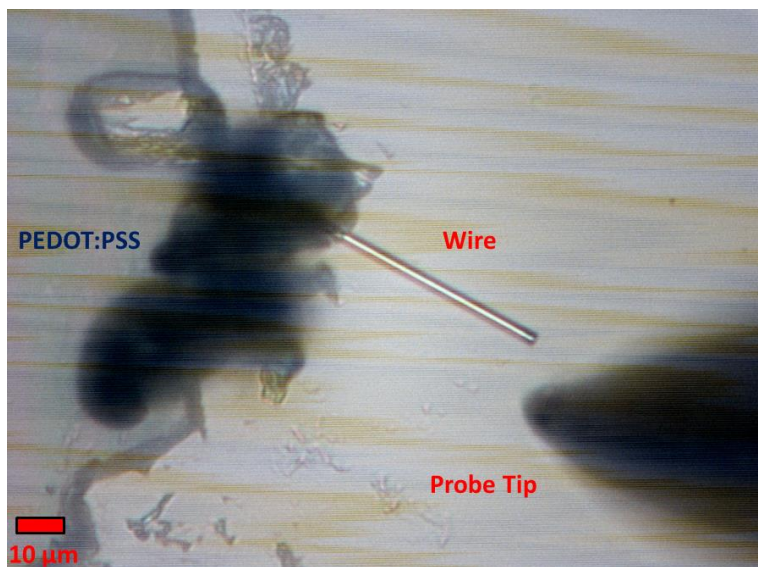


Figure S4: Light microscope image of typical electrical characterization setup at 400x.