

The Effect of Functional Groups on the Sensing Properties of Silicon Nanowires towards Volatile Compounds

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Synthesis of 5-phenylvaleric chloride:

Phenylvaleric acid (2g) was dissolved in 10 mL CH_2Cl_2 in a two-neck flask at room temperature. Then thionyl chloride (SOCl_2 , 4 mL) and 1 drop of N,N-Dimethylformamide (DMF) were added. The mixture was reflux stirred for 17 h under the protection of a dry tube. Excess SOCl_2 and CH_2Cl_2 were removed by rotary evaporation. After evaporation of volatiles, the phenylvaleric chloride was obtained as a red liquid.

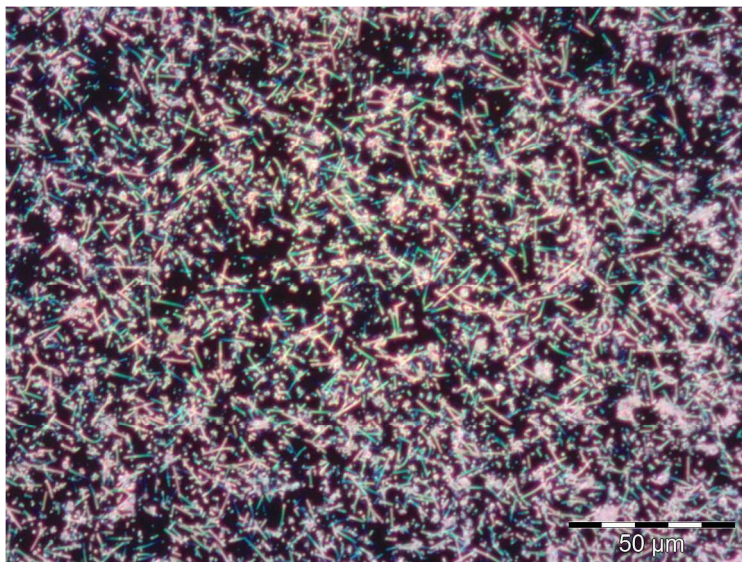


Figure S1. Typical dark field optical microscope image of spray coated SiNW mat.

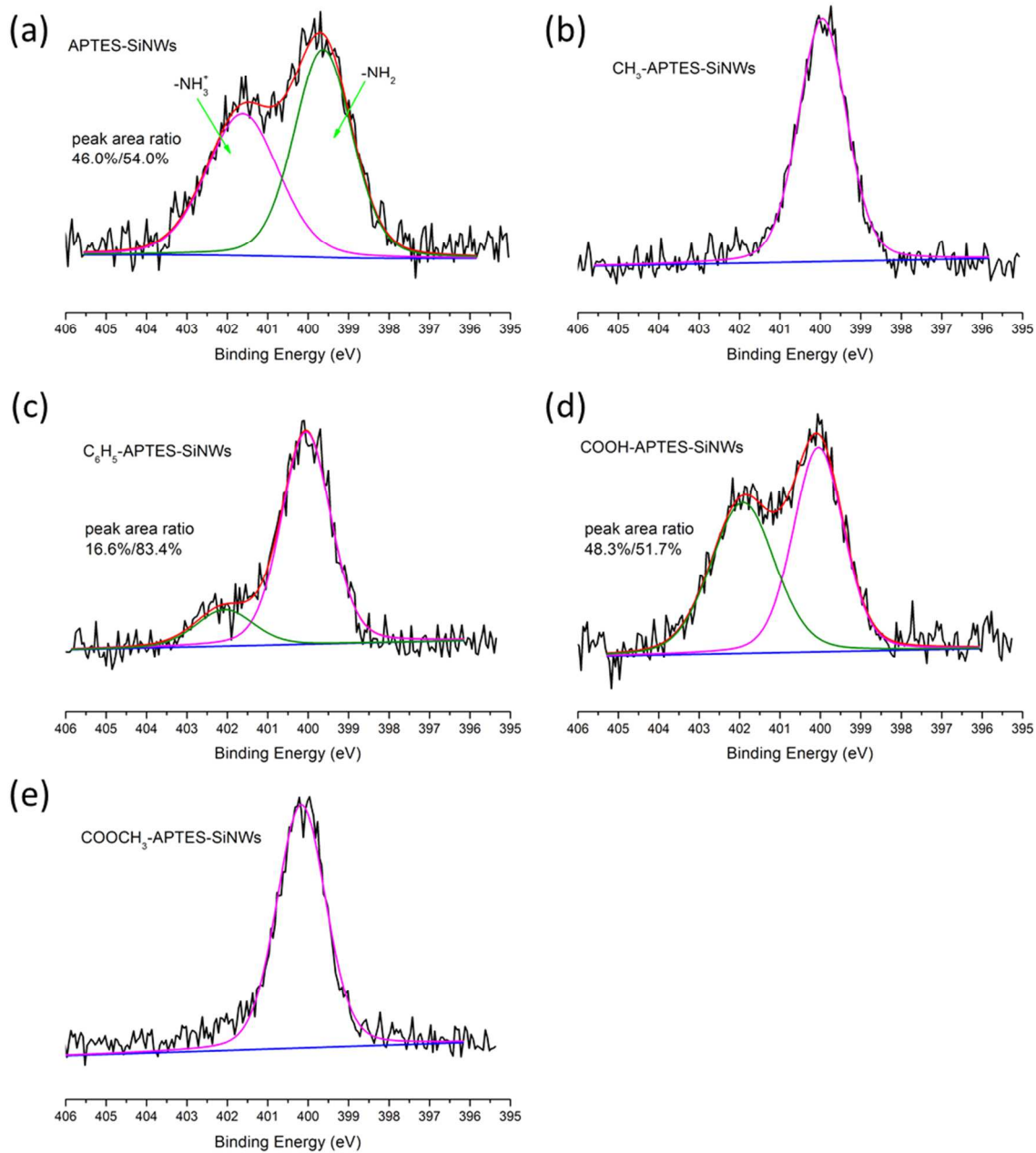


Figure S2. XPS N1s spectra of (a) APTES-SiNWs; (b) CH_3 -APTES-SiNWs; (c) C_6H_5 -APTES-SiNWs; (d) COOH -APTES-SiNWs; and (e) COOCH_3 -APTES-SiNWs.

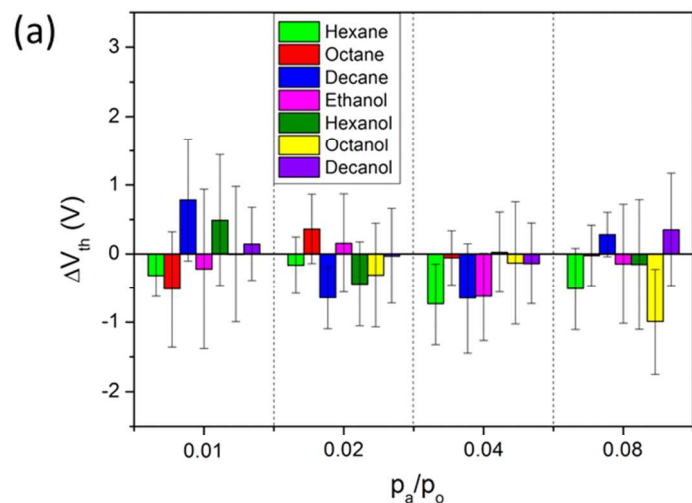


Figure S3. (a) ΔV_{th} ; and
(b) $\Delta \mu_h$ of bare Si NW
FET upon exposure to
various concentrations of
polar and nonpolar VOCs

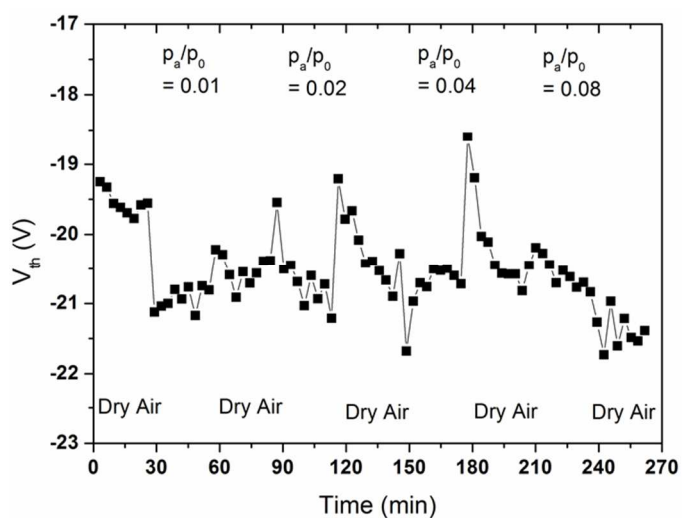
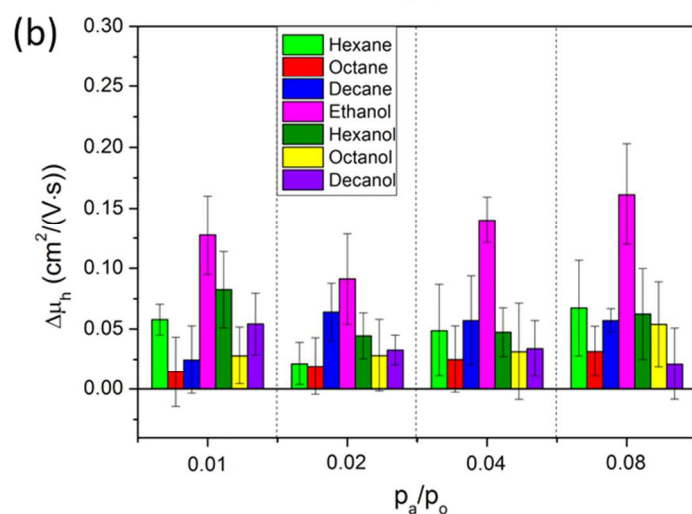


Figure S4. Plot of V_{th} versus
time of COOH-SiNW FET
upon exposure to various
concentrations of hexanol.