

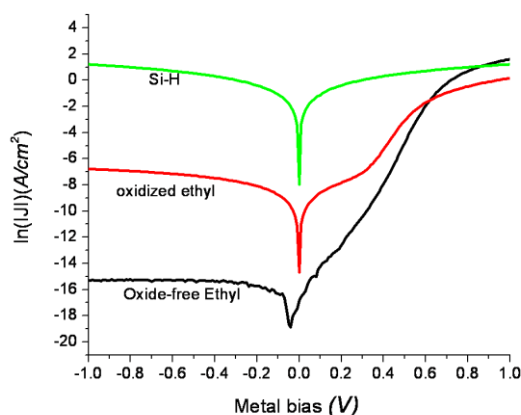
Supporting Information for:

## *Molecular electronics at Metal / Semiconductor Junctions*

### **Si inversion by Sub-nm Molecular Films**

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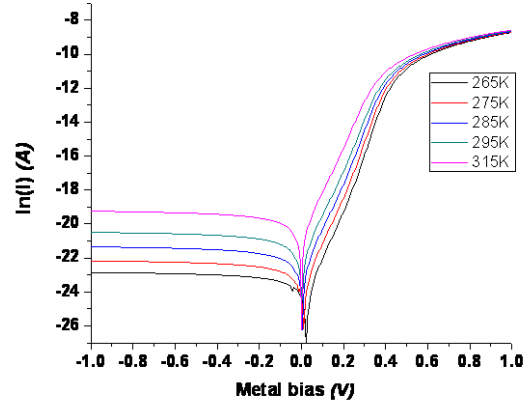
- 1. Comparison between J-V curves of an oxide-free ethyl monolayer, oxidized ethyl monolayer and H terminated Si junction.** The results demonstrate the high sensitivity of the electrical transport properties to the quality of the monolayer.



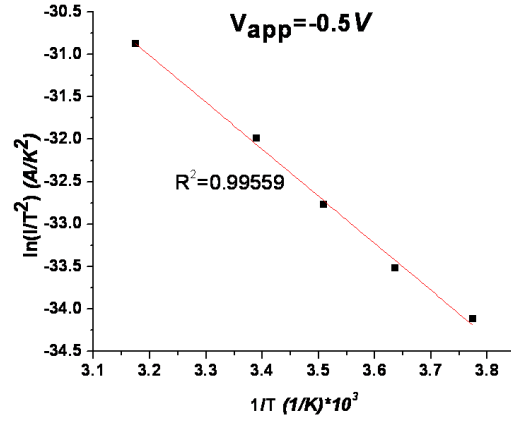
**Figure s1:** Comparison between  $\ln(|J|)$ -V curves of oxide-free ethyl monolayer, partially oxidized ethyl monolayer and H-terminated Si.

- 2. I-V-T data on  $\langle 111 \rangle$  n-Si-C<sub>2</sub>H<sub>3</sub>/Hg junction** is presented in figure s2. The activation energy was extracted from an Arrhenius plot taken from the reverse bias currents as presented in figure s3 where  $V_{app} = -0.5V$ . Figure s4 presents the extracted Activation energy throughout the reverse bias.

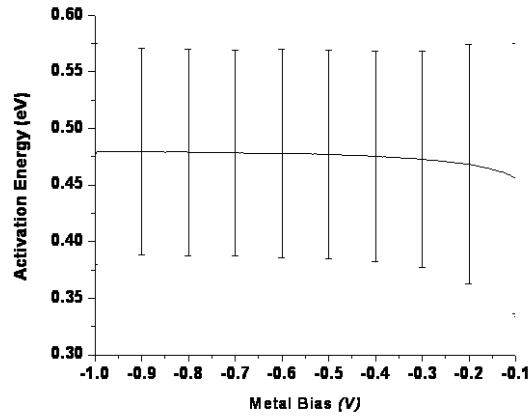
Temperature-dependent measurements were conducted on molecular junctions with a liquid Hg drop using an MMR variable temperature measurement system, as described in detail elsewhere<sup>7,8</sup>.



**Figure s2:** I-V-T measurements on a <111> n-Si-C<sub>2</sub>H<sub>3</sub>/Hg junction between 265 and 315 K.



**Figure s3:** Typical reverse bias Arrhenius plot at  $V_{app} = -0.5$  V for the data of Fig. s3. The activation energy was extracted from the slope of the curve divided by  $q/k_B$ .



**Figure s4:** Activation energies for transport, deduced from plots such as that shown in Fig. s3, for bias voltages throughout the reverse bias regime. The error bars represent the standard error of the linear regression.