Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Hopping And Trapping of F4TCNQ on h-BN Nanomesh[1] HUANYAO CUN, SILVAN ROTH, ARI SEITSONEN, HAIFENG MA, JURG OSTERWALDER, THOMAS GREBER, None, PHYSICAL-CHEMISTY INSTITUTE @UZH COLLABORATION — A single layer of hexagonal boron nitride (h-BN) on Rh(111) (nanomesh) [1] is an excellent template for trapping and self-assembly of molecules. This hexagonal structure has a periodicity of 3.22 nm and an appearance with strongly bound h-BN regions called "pores" of about 2 nm in diameter surrounded by h-BN regions called "wires." The trapping mechanism traces back to a corrugated electrostatic potential at the surface [2]. We have investigated the adsorption behavior of an electron acceptor molecule, tetrafluoro-tetracyano-quinodimethane (F4TCNQ) on nanomesh by combining XPS, UPS, STM and DFT calculation. The work function increase upon F4TCNQ adsorption indicates electron transfer to the molecules, and is in good agreement with the DFT result. At room temperature, F4TCNQ adsorbs on the "wires" and in the "pores" because of a high mobility. STM measurements allow us to detect the hopping rate of molecules. Upon cooling, molecules are trapped inside of pores, which gives insight into the behavior of a negatively charged molecule, compared to neutral species, in the trapping potential of h-BN nanomesh.

[1]The project is supported by the Sinergia Program of the Swiss National Science Foundation.

Huanyao Cun
None

Date submitted: 15 Nov 2011 Electronic form version 1.4