Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

**Exponential temperature dependence of conductance in metal-organic sandwiches** CORNELIU COLESNIUC, Department of Physics, University of California San Diego, La Jolla, Ca 92093, ALEXANDER BALATSKY, Theoretical Division and Center for Integrated Nanotechnology, Los Alamos National Laboratory, Los Alamos, NM 87545, IVAN SCHULLER, Department of Physics, University of California San Diego, La Jolla, CA 92093 — An exponential temperature dependence of the conductance was found in the linear regime of the J-V curves in palladium-copper phthalocyanine (CuPc)-palladium trilayers. The devices were prepared in-situ by UHV organic molecular beam epitaxy using a floating shadow mask. DC electrical measurements were performed as a function of film thickness and temperature. The low voltage conductance increases exponentially with temperature for devices with thicknesses between 20 nm and 600 nm. The temperature dependence can be explained by assuming that: a) the carriers tunnel through rectangular barriers formed by small groups of molecules along parallel molecular stacks, b) molecular disorder and phonons produce fluctuations that modulate the barrier potential and c) self averaging over different configurations occurs within each conduction channel. Work supported by AFOSR and DOE

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Date submitted: 16 Dec 2009 Electronic form version 1.4