Abstract Submitted
for the CAL13 Meeting of
The American Physical Society

Activation Energies of Copper Phthalocyanine Thin Films Using Impedance Spectroscopy KYLE ROBINSON, THOMAS GREDIG, California State University, Long Beach — Impedance spectroscopy is used to study copper phthalocyanine thin films in order to disentangle the effective activation energies of the crystalline bulk and the grain boundaries. The spectroscopy data is fit with an equivalent circuit model to determine the activation energy for samples with different grain morphologies. The copper phthalocyanine thin films are deposited via thermal evaporation on platinum interdigitated electrodes on glass substrates at temperatures from 300 K to 530 K with constant thickness of 22 nm. The AC measurements, implementing a precision LCR meter are taken from 20 Hz - 2 MHz, and at measurement temperatures from 25 - 90 °C. The activation energy for the grain boundary peaks at 1.29 ± 0.12 eV near the structural phase-transition temperature for CuPc thin films, whereas the crystalline bulk component has a constant activation energy of 0.34 ± 0.08 eV for all samples with different grain sizes.

This research has been funded by the National Science Foundation (NSF) grant DMR-0847552.

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Date submitted: 03 Oct 2013 Electronic form version 1.4