Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Generating tunable structures in glassy materials: Smectic-like layering in glasses of a liquid crystal system prepared by vapor deposition ANKIT GUJRAL, JARITZA GOMEZ, JING JIANG, CHENGBIN HUANG, University of Wisconsin-Madison, KATHRYN O'HARA, University of California Santa Barbara, MICHAEL TONEY, Stanford Synchrotron Radiation Lightsource, MICHAEL CHABINYC, University of California Santa Barbara, LIAN YU, MARK EDIGER, University of Wisconsin-Madison — Anisotropic packing, particularly in highly ordered liquid crystalline configurations, has been shown to be useful in organic electronic and optoelectronic applications. In this work, vapor deposited glasses of a model smectic liquid crystal-forming molecule, itraconazole, are investigated. The films are characterized using x-ray scattering, FTIR and spectroscopic ellipsometry, and are found to exhibit unprecedented structural and optical anisotropy for a macroscopically homogeneous solid. A smectic-like layered structure is observed in the glasses that are prepared by depositing the glass at a substrate temperature during deposition (T_{sub}) maintained below the glass transition temperature, T_g, of the molecule. The layer spacing, and the associated average tilt angle of the molecules, is found to be tunable as a function of T_{sub}. The layer spacing reduces by 16% as T_{sub} is lowered. These features are retained in the films when heated to at least T_g of the molecule.

Ankit Gujral
University of Wisconsin-Madison

Date submitted: 06 Nov 2015 Electronic form version 1.4