

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Optical emission and vibrational modes of uniform pentacene monolayers (*) RUI HE, Columbia Univ, NANCY TASSI, GRACIELA BLANCHET, Dupont, Central Research and Development, ARON PINCZUK, Columbia Univ, Bell Labs — Pentacene monolayers are probed by photoluminescence and resonant Raman spectroscopies below 10K. Monolayers grown on polymeric substrate of poly-alpha-methyl-styrene (PAMS) exhibit high uniformity within micron size clusters. These films show sharp exciton luminescence bands, and the energy of the exciton optical emission displays a red-shift as the average film thickness increases. The large resonance enhancements of Raman scattering intensities enable the measurements of low-lying (40- 200cm⁻¹) optical lattice vibrations from these monolayers. These experiments demonstrate that luminescence and resonant Raman scattering from single pentacene monolayers are venues for probing 2D properties, studies of interface effects, and thin film characterization. (*) Supported primarily by the Nanoscale Science and Engineering Initiative of the National Science Foundation under NSF Award No. CHE-0117752 and by the New York State Office of Science, Technology, and Academic Research (NYSTAR), and by a research grant of the W. M. Keck Foundation.

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Date submitted: 29 Nov 2005

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