Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Remarkable Effects of Gating on the Photoconductivity of Porphyrin Nanorods C. K. RILEY, X. HUANG, W. F. SMITH, Haverford College, D. E. JOHNSTON, A. T. JOHNSON, Univ. of Pennsylvania — Tetrakis(4-sulfonatophenyl) porphine self assembles into well-defined nanorods with intriguing photoelectronic properties.[1] For example, when light is applied, the conductivity immediately jumps up from zero, then grows further over several hours. This may be due to a light-induced structural change. In recent experiments, we imaged the nanorods with AFM while measuring the photoconductivity; we observed no change in morphology. We also deposited nanorods onto oxidized silicon substrates. We find that the photoconductivity is not sensitive to the value of the gate voltage applied to the underlying silicon, but only to changes in the gate voltage. The photoconductivity increases when the gate voltage is increased, but then relaxes back to its original level over about one hour. When the gate voltage is decreased, the photoconductivity decreases, and again slowly relaxes back. These results may be associated with structural changes caused by the electric field of the gate, which may affect filling of trap states. [1]A.D. Schwab *et al.*, Nano Letters **4**, 1261 (2004).

Walter F. Smith
Haverford College

Date submitted: 27 Nov 2007 Electronic form version 1.4