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Photoconductivity, High-resolution AFM, and Scanning Conductance Microscopy of Porphyrin Nanorods ALEXANDER D. SCHWAB, LAUREN L. COMFORT, JOHN IANNACONE, JACLYN O'PELLA, JULIO C. DE PAULA, WALTER F. SMITH, Haverford College, DEIRDRE E. SMITH, DANVERS E. JOHNSTON, ALAN T. JOHNSON, University of Pennsylvania, JAMES HONE, Columbia University — We have shown[1] that the diacid form of the porphyrin tetrakis(4-sulfonatophenyl) porphine ($TPPS_4$) self assembles into nanorods with well-defined height and width. Upon illumination, their conductivity grows over hundreds of seconds. They also produce a zero-bias photocurrent with trainable polarity.[2] We present measurements as a function of illumination wavelength and intensity, which support a model of charge hopping along paths of previously photoionized porphyrin molecules. We also give results from Scanning Conductance Microscopy experiments; these are designed to clarify the role of the contacts in the DC measurements. Our high-resolution AFM images support the model of a hollow tube[3], which collapses on contact with the substrate. [1]A.D. Schwab *et al.*, J. Phys. Chem. B **107**, 11339 (2003). [2]A.D. Schwab *et al.*, Nano Letters **4**, 1261 (2004). [3]S.C.M. Gandini, E.L. Gelamo, R. Itri, and M. Tabak, Biophys. J. **85**, 1259 (2003).

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