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**Reversible Persistence and Effects of Oxygen on the Photoconductivity of Porphyrin Nanorods** E. A. MULLER, V. H. JOINES, W. F. SMITH, Haverford College, A. D. SCHWAB, Appalachian State U., J. C. DE PAULA, Lewis and Clark College, D. E. JOHNSTON, A. T. JOHNSON, U. of Pennsylvania — Tetrakis(4-sulfonatophenyl) porphine ($TPPS_4$) self assembles[1] into well-defined nanorods with intriguing photoelectronic properties.[2] New experiments show that illumination under Ar for several hours induces a change to persistent behavior, i.e. conductivity decays slowly when light is removed, rather than dropping to zero. After resting 24 hours, the sample recovers non-persistent behavior. The dark conductivity of $TPPS_4$ aggregates formed by a different technique is sensitive to $O_2$.[3] We find that the conductivity under illumination of nanorod aggregates decreases when 0.2% $O_2$ is added, but this change is reversible. By contrast, if the sample is exposed to 21% $O_2$ shortly after light is removed, the photoconductivity is permanently lowered. These effects may be due to a combination of $O_2$-mediated quenching of excited state porphyrin and oxidation. [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]Y. Otsuka *et al.*, Nanotechnology **15**, 1639 (2004).

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