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Characterization of the Porphyrin Molecule as an Electronic Component SATHISH THRIUVENGADAM, Louisiana State University, KIM LEWIS, Louisiana State University, RAGHU RAMACHANDRAN, Louisiana State University, ROYSTON SIOW, Louisiana State University, THEDA DANIELS-RACE, Louisiana State University — Porphyrins have recently generated great interest as a potential "electronic material" for use in functions such as sensing (i.e.-carbon monoxide), biomolecular and medical physics applications (i.e. antiviral agents) and for computer memory capability. Fundamental to the latter of these three and to the realization of molecular based electronic devices is the phenomenon of self-assembly. In this work, we investigate the electronic characteristics of porphyrins, using directed self-assembly monolayer of n-alkanethiols. SAM of alkanethiols on gold surfaces has been shown to form stable surface structures. It is expected that the exchange of molecules is most active at SAM defective sites, substrate step edges and substrate vacancy islands. We measure the I-V characteristics of porphyrin molecules by directed self-assembly in the SAM defect sites. It is observed in ambient conditions using conductive probe atomic force microscopy (CPAFM). The conductivity of porphyrin molecules in alkanethiol SAM is discussed here. This experimental result is further enhanced by our group through "AFM study of current transport through porphyrin based molecules."

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