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Structural Changes in Phthalocyanine Thin Films from Analyte Vapor Exposure[1] THOMAS GREDIG, GE LIU, CORNELIU N. COLESNIUC, Department of Physics, UC San Diego, FOREST I. BOHRER, ANDREW C. KUMMEL, Department of Chemistry and Biochemistry, UC San Diego, IVAN K. SCHULLER, Department of Physics, UC San Diego — Organic phthalocyanine thin films were fabricated with varied thicknesses and varied grain size structure. These films act as gas sensors as detected via conduction measurements due to analyte vapors. We have observed structural changes with high-resolution x-ray diffraction due to exposure to different analyte vapors. In thin films with small grains (∼30nm diameter), low-angle irreversible changes and high-angle reversible variations were observed. We associate the irreversible behavior with current drift observed in transport measurements. In contrast, reversible variations of the first Bragg peak of the phthalocyanine are compared to the sensing changes in conductivity from exposure to analyte vapors.

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