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Tilt Angle Determination in Thin Films with Anisotropic Molecules[1] THOMAS GREDIG, Dept of Physics, California State Univ, Long Beach, CA 90840, GE LIU, IVAN K. SCHULLER, Dept of Physics, University of California, San Diego, La Jolla, CA 92093 — Many electronic properties of organic semiconductors depend critically on their physical and chemical arrangement of atoms. Here, a method is described to extract information about the molecular tilt angle and to determine the center electron density of anisotropic molecular thin films by means of specular x-ray diffraction. Thin films of phthalocyanine (Pc), an anisotropic molecule with a metal ion in the center, have been deposited in an organic molecular beam deposition system and studied with high-resolution x-ray diffraction. In particular, two isomorphous molecules, H_2Pc and CuPc, are compared experimentally and then studied with numerical simulations. The results show that the intensity distribution of the diffraction peaks belonging to the same series of lattice planes provides important structural information such as the molecular tilt angle or the center electron density of the anisotropic molecule.

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