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Magneto-optical spectroscopic studies of solid and solution-phase tetra-phenyl porphyrin¹ JACOB WAHLEN-STROTHMAN, ZHEN WEN PAN, LANE MANNING, MADALINA FURIS, KELVIN CHU, University of Vermont — Tetraphenylporphyrin (TPP) is a synthetic heterocyclic compound that serves as a model system for heme proteins and cytochromes. TPP can accommodate a metal ion in the center; D-shell ion porphyrin complexes with a crystalline solid phase are of interest for magnetic studies because of the possibility of macroscopic long range magnetic order of the ion spins. We have investigated the 5K magnetic properties of poly-crystalline thin films of the heme protoporphyrin IX analogue tetra-phenyl porphyrin, complexed with Zn and Mn, deposited through a capillary pen technique that produces 100um to 1 mm sized grains. Our novel experimental setup measures the UV/VIS, linear dichroism and magnetic circular dichroism simultaneously, incorporates a photoelastic modulator and a microscopy superconducting magnet for high-field (5T) measurements. We present solution and crystalline data on metal-complexed TPP; data are analyzed in terms of A and B-type MCD using a perimeter model. We find good agreement with previous solution data, and novel crystalline phase spectra that are correlated to the long range ordering.

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