

Using magnetic birefringence to determine the molecular arrangement of supramolecular nanostructures

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Abstract. Supramolecular aggregates can be aligned in solution using a magnetic field. Because of the optical anisotropy of the molecular building blocks, the alignment results in an anisotropic refractive index of the solution parallel and perpendicular to the magnetic field. We present a model for calculating the magnetic birefringence, using solely the magnetic susceptibilities and optical polarizabilities of the molecules, for any molecular arrangement. We demonstrate that magnetic birefringence is a very sensitive tool for determining the molecular organization within supramolecular aggregates.

Keywords: magnetic field, birefringence, sexithiophene, conjugated oligomers, supramolecular aggregates, alignment

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