Optical Topographies of Chiral Structures

Werner Kaminsky, Bart Kahr, *University of Washington, Department of Chemistry Seattle, USA*. E-mail: wernerka@u.washington.edu

Can optical rotatory power, a phenomenon typically associated with chirality or handedness, be used as a contrast mechanism in microscopy? Chiroptical imaging techniques have not heretofore been implemented. This neglect has created a hole in the science of molecular chirality, particularly with respect to complex, heterogeneous, organized media. We built a circular extinction imaging microscope to examine chromophores in anisotropic hosts. With this instrument, images of crystals were made via two mechanisms, intrinsic circular dichroism (CD) and a new effect that was discovered and called anomalous circular extinction (ACE). Through these new chirality "spectacles" we have observed left and right handed twinning in crystals of a dye that was masked by all previous methods of analysis, Figure 1 [1]. However, when turned onto unusual dyed crystals, we observed optical effects that mimic those due to chirality.

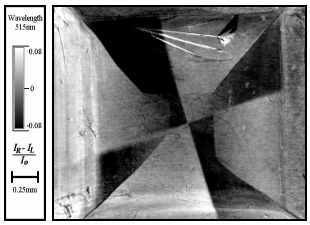

Figure 1. Circular Dichroism in 1-8-Dihydroxyanthraquinone.

[1] Claborn K., Puklin-Faucher E., Kurimoto M., Kaminsky W., Kahr B., *J. Am. Chem. Soc,*. 2003, **125**, 14825-14831.

Keywords: chirooptical properties, circular dichroism measurement, dyes