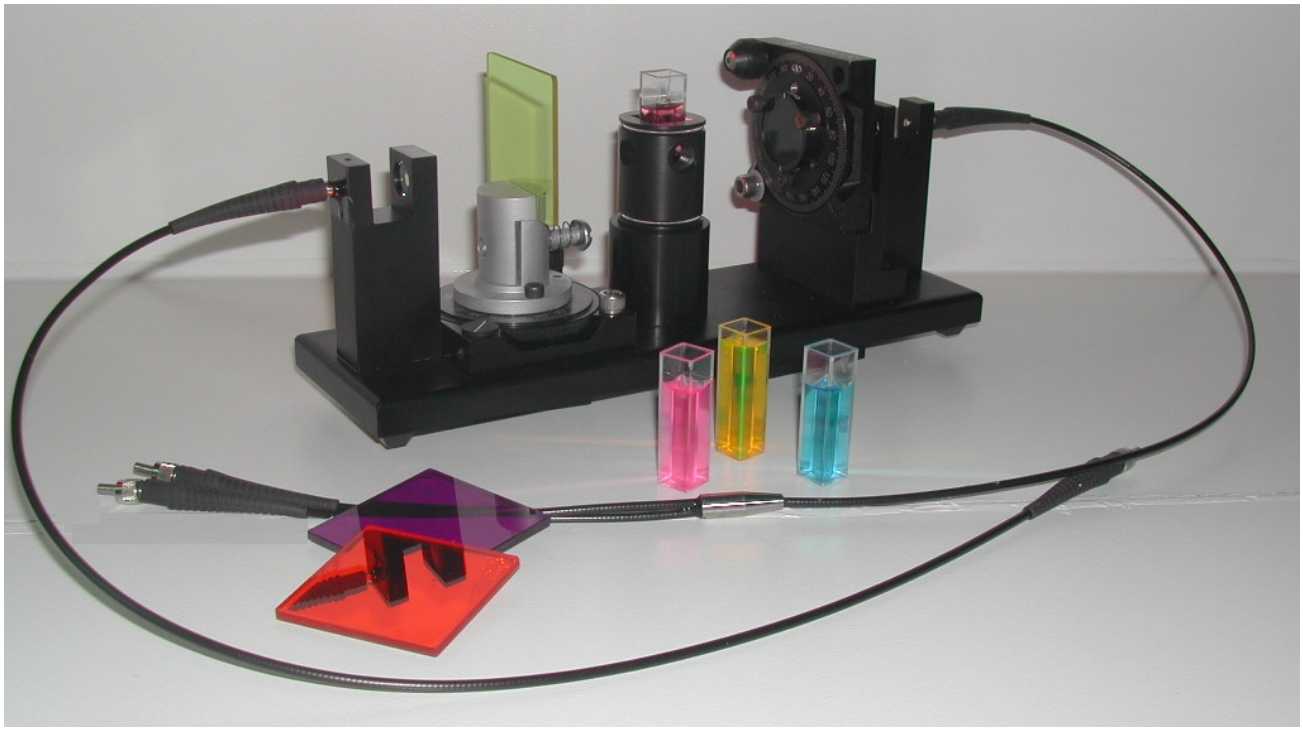
Chirality/Circular Dichroism Sampling Bench



Chiral separations and identification have become increasingly important for applications including drug discovery, biochemical analysis and organic synthesis. SI Photonics is pleased to introduce another design breakthrough in the ***Chirality/Circular Dichroism Sampling Bench.*** For use in determining the optical activity required for structural determination of +/- isomers and molecular orientation of thin films, the bench is compatible with all *400 Series UV-Vis Sectrophotometers* and is available exclusively through SI Photonics. The bench accommodates standard cuvettes and incorporates a rotational slide holder and a rotational polarizer. The polarizer is hinged allowing for easy movement in/out of the optical axis. This feature allows for unobstructed use for performing traditional UV-Vis spectroscopy.

Developed with the research chemist in mind, the bench further extends the research capabilities of our highly acclaimed spectrophotometers. Expensive, chiral dichroism spectrophotometers are no longer necessary and can be substituted with the sampling bench accessory.

The cuvette holder is ideally suited for determining the chirality of liquid solutions and distinguishing right and left hand isomers. The use of the srotaing slide holder acts as a goniometer for determining the molecular orientation, tilt and rotation of Langmuir-Blodgett films.

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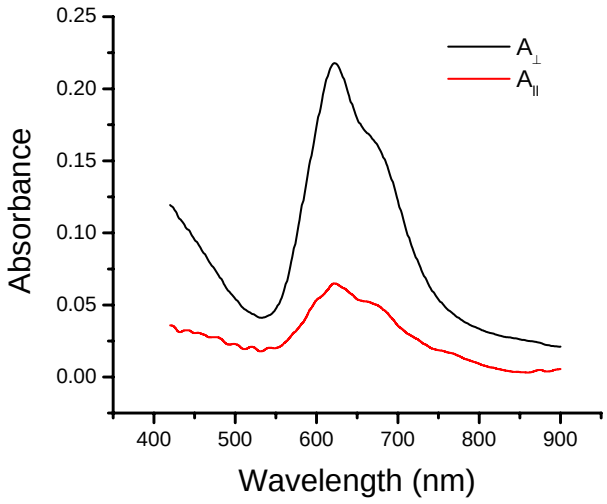
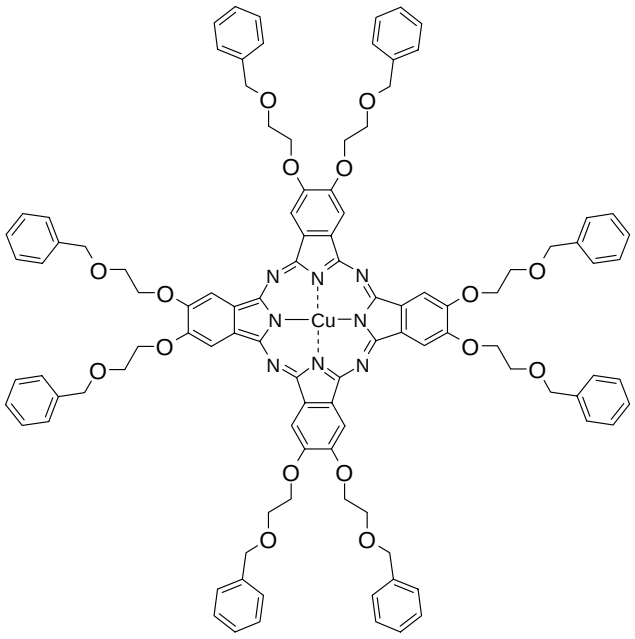
Polarized absorbance spectra for a Langmuir-Blodgett deposited 9-bilayer film.

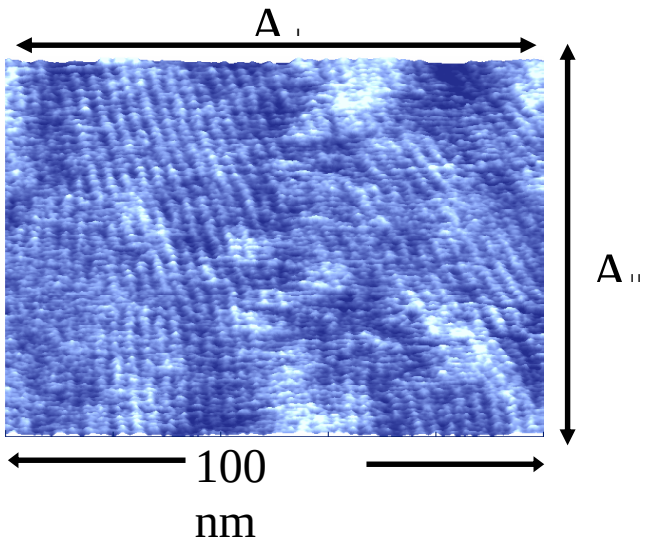


This spectra depicts the 9-bilayer film of 2,3,9,10,16,17,23,24-octakis (2-benzyloxyethoxy) phthalocyaninato copper(II) on hydrophobized glass.[1,2]



Under these film preparation conditions, these molecules form molecular columns, up to 300 nm long, which run in a fixed direction within the sample plane, as shown in the accompanying atomic force microscopy image.[2,3]

The electronic transition dipole for these molecules is



effectively circularly polarized within the plane of the molecule, and the molecule will therefore absorb strongly when a polarized electric field is aligned with the molecular plane. The observed absorbance is much higher when the electric field is polarized perpendicular to the column direction, than when parallel to it ($A_{\perp}/A_{||}$ = 3.0) because of the ordered rotation of the molecular plane away from the column axis. Polarized absorbance measurements on films such as these give a measure of film order, and molecular orientation can be inferred.[1] By acquiring these spectra at two incident angles of the probe beam with respect to the sample plane, molecular tilt and rotation can be calculated.[4]

References:

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2. Smolenyak, P. E.; Osburn, E. J.; Chen, S. Y.; Chau, L. K.; O'Brien, D. F.; Armstrong, N. R. *Langmuir* **1997**, *13*, 6568-6576.
3. Zangmeister, R. A. P.; Smolenyak, P. E.; Drager, A. S.; O'Brien, D. F.; Armstrong, N. R. *Langmuir* **2001**, *17*, 7071-7078.4. Manno, D.; Rella, R.; Troisi, L.; Valli, L. *Thin Solid Films* **1996**, *280*, 249-255