



LINEAR DICHROISM (part III)

The argument has been treated already in T.R. n° 16 and 30.

This time we would like to introduce alternative methods to measure LD with a CD spectrometer and *new* sampling devices.

Alternative methods

If your unit has only CD capabilities (so no double frequency lock-in amplifier is available) you can measure LD simply inserting an achromatic quarter wave plate before the sample.

- achromatic Mica, Quartz and MgF₂ retarders are commercially available, they do cover however restricted wavelength range (for example 180-300nm for a quartz/MgF₂ given combination)
- Fresnel Rhombs do the same job in a wider range (for example 215-400nm) and a cheaper. The drawback of $\lambda/4$ Fresnel rhombs is that beam offset is generated, this call for a simple redesign of the sample holder and an adapter plate to reposition the photomultiplier tube.
- “K” prisms with $\lambda/4$ retardation are free from beam displacement and cover a wide wavelength range, but they are far more expensive.
- Soleil-Babinet compensators are the last choice, more versatile, but calling for adjustment ... and even more expensive.

Notes:

-data obtained from Bernhard Halle Nachfl. GmbH catalog (<http://www.b-halle.de>), many other manufacturers can supply similar items of variable price/quality

-all our testing were performed on Jasco spectrometers which offer a clear advantage in this respect versus other CD units: the sample beam is nearly parallel, not focussed on the center of the sample compartment.

New sampling devices

For biological applications (DNA) flow orientation method is typically required.

Most of the published papers have been generated using the Couette flow cell described by Wada¹ and built commercially by Shimadzu over 30 years ago.

This item and its spares are no more available, while still in use in a few laboratories; some users duplicated (and eventually improved) the device, others are forced to repair it when it breaks down. Actually most of new users had to choose conventional short path flow-through cells associated with a recycling pump.

The good news is that today a new commercially available solution is available.

The cell was developed under guidelines of Alison Rodger (A.Rodger@warwick.ac.uk), the well known English specialist of the LD technique.

This should be best warranty for everybody. The company which carried on the job is in UK: Crystal Precision Optics (e mail info@crystal-optics.u-net.com, <http://www.crystal-optics.u-net.com>), a small company fabricating instruments incorporating crystals.

The (kind and competent) man behind is named Rhod Mortimore.

They also developed for Alison a flow orienting device for the IR field and they are progressing variants which can be thermostatted.

¹ Wada A., Kozawa S., *J. Polymer. Sci.*, A2, 1964, 853