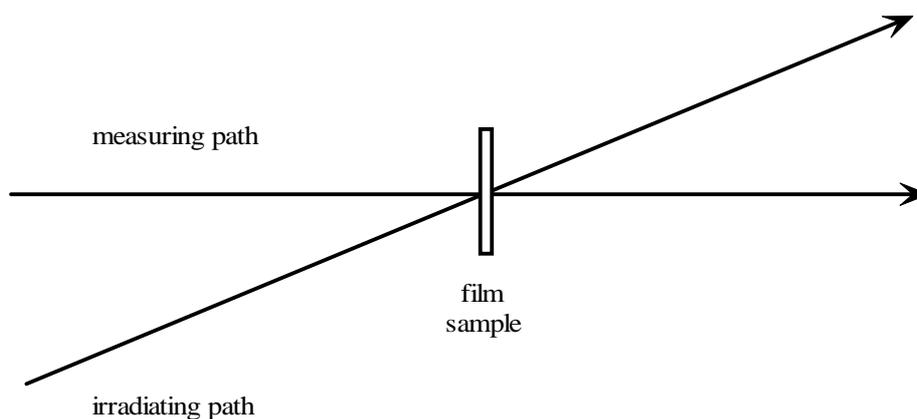


PHOTOINDUCED CHIRALITY IN POLYMER FILMS

Materials Science is currently giving a lot of attention to induced chirality on azobenzene-containing polymer films.



The irradiating path is often a laser beam, unpolarized, linearly polarized or circularly polarized depending on the type of sample/experiment. The change of type of polarization of the laser is typically not so difficult, since we deal with a single wavelength, well geometrically defined, beam.

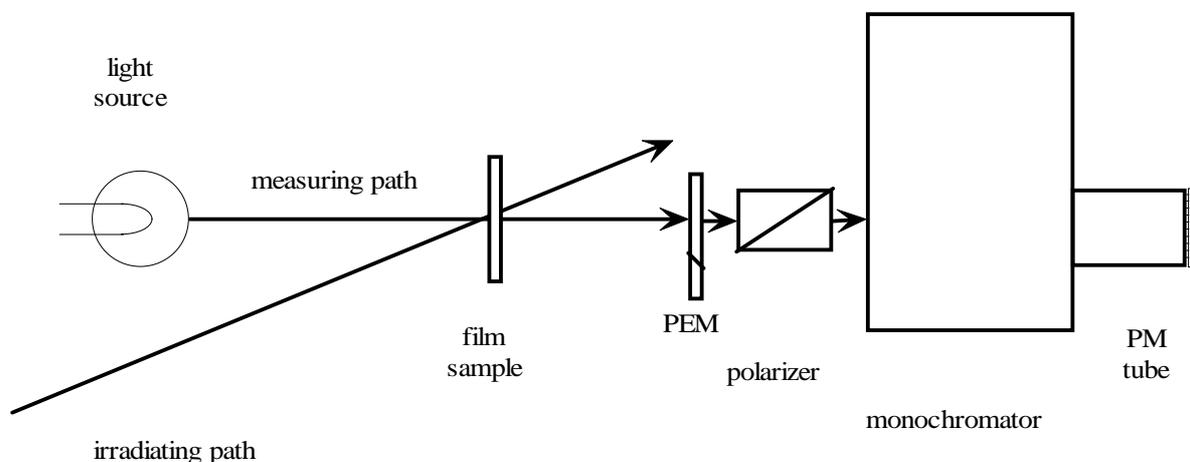
The measuring path is a *polarimeter* or in any case a device able to measure the photoinduced changes.

The spectral CD measurement on the films can be handled only off-line, i.e. film is irradiated and later on transferred to a standard CD spectrometer.

This approach is limiting. It'd be often very nice to carry on CD measurement while irradiation is in progress or while modulating the irradiation path intensity, polarization etc.

This is usually impossible, even when arranging a dedicated sample compartment, since the laser beam scattering will saturate the photomultiplier tube of the CD spectrometer, unless irradiation and measurement wavelengths are far apart and filters or restricted spectral response PM tubes can be used.

The only way to solve the problem is to use a reversed optics CD spectrometer (not commercially available), i.e. one in which the monochromator is after the sample.



Adding proper, extra, components the set-up can be extended to measure also LD, ORD and LB

In any case a tailored equipment is necessary, this may be arranged putting together commercial components on an optical bench or, as a cheaper and less demanding way, using a dismissed CD spectrometer to be heavily modified for the job.

A few random selected references are listed here:

- Nikolova L., Todorov T., Ivanov M., Andruzzi F., Hvilsted S., Ramanujam P.S., *Opt.Mater.* 8, 255, 1997
- Ivanov M., Naydenova I., Todorov T., Nikolova L., Petrova T., Tomova N., Dragostinova V., *J.Mod.Opt.* 45, 861, 2000
- Nikolova L., Nedelchev L., Todorov T., Petrova T., Tomova N., Dragostinova V., Ramanujam P.S., Hvilsted S., *Appl.Phys.Lett.* 77, 657, 2000
- Choi D.H., Kang S.H., *Bull.Korean Chem.Soc.* 20, 1186, 1999
- Iftime G., Labartet F.L., Natansohn A., Rochon P. *J.Am.Chem.Soc.* 122, 12646, 2000
- Angiolini L., Bozio B., Giorgini L., Pedron D., Turco G. *Book of Abstracts "ICON'6 2001"*, Tucson, Dec 2001

For a wider look at photochromic polypeptides and chiroptical switches two reviews are listed here:

- Pieroni O., Fisi A., Popova G., *Prog.Polym.Sci.* 23, 81, 1998
- Feringa B.L., van Delden R.A., Koumura N., Geertsema E.M., *Chem.Rev.* 100, 1789, 2000

CD is not only secondary structure estimation of proteins!