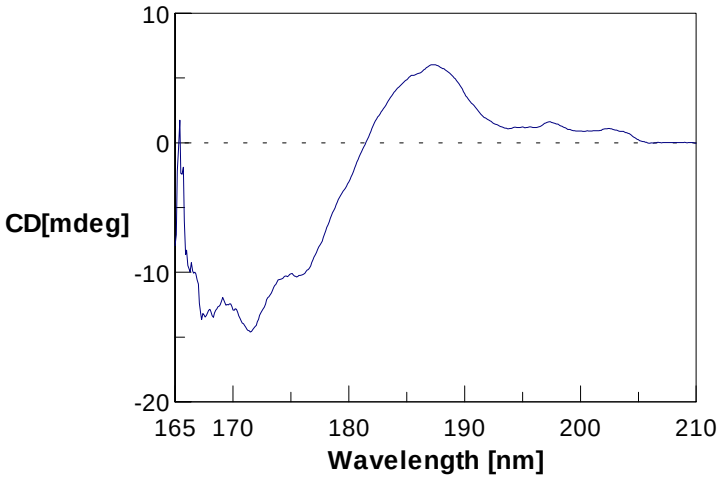
TECHNICAL REPORT N° 80 **Jan 2003**

GAS PHASE CD

Solvent free CD spectra are often a dream for spectroscopists, since it's well known that solvents may cause shift of CD bands as well as shape changes.
This may be a specific drawback when experimental spectra should match theoretical calculations.
Gas phase CD spectra is an answer to above requirement.
However there are limitations:
-gas phase spectra are typically restricted to small molecules with sufficient vapor pressure at room temperature
-increasing sample temperature may extend the field, but sample stability (neglecting experimental difficulties) may be problematic
-proper signal intensity is also often only possible using special cells with long path. These must be specially constructed and may not fit the geometry of the sample beam of some spectrometers.
In CD experiments you cannot benefit from the folded path long cells commonly used in IR spectroscopy: any reflection will invert the polarization!

Up to 100mm room temperature gas cells are commercially available, when elevated temperature are necessary IR type gas cells (obviously equipped with quartz windows) are on the market and may fit any spectrometer with minimum modifications.
Jasco spectrometers, due to the nearly parallel sample beam can be modified to accept longer custom-built cells with reasonable costs.
The sampling beam size of a few synchrotrons CD around may give further advantages in this respect and in addition a fair extension of the range in the VUV.

The spectra below refers to d-Camphor gas (saturated vapour in N_2 gas) run in a 50mm path cell at room temperature using a Jasco J-720 standard spectrometer.
Scanning parameters were 50nm/min, 1nm SBW, 1sec response time; spectrum shown is the average of 16 runs.



It can be easily compared with what obtained in Germany[1] using also ESA synchrotron radiation in a nice paper we will strongly recommend.

[1] Pulm F., Schramm J., Lagier H., Hormes J., *Enantiomer*, 3, 1998, 315

Jasco Europe srl via Confalonieri 25 23894 Cremella (Lc) Italy tel (0039)-039-956439 fax 039-958642
e-mail jasco@jasco-europe.com internet http://www.jasco-europe.com