



## THE USE OF JASCO J-810 AS A UV-VIS SPECTROPHOTOMETER

Possibility to get from a CD spectropolarimeter also regular absorption spectra is appealing for different reasons.  
-it's good practice and often it's absolutely necessary to correlate the CD data with the corresponding absorption spectra

-specific sampling conditions may not allow to get the absorption spectra in the same experimental conditions  
-if data can be obtained simultaneously, time and precious sample may be saved  
-suitable UV-Vis spectrophotometer may not be available

In a normal operating mode CD instruments operate in a dynode feedback mode, i.e. the voltage (H.T.) applied to the photomultiplier tube (P.M.) is automatically adjusted to keep constant the DC signal level at it's output. Since years Jasco CD spectropolarimeters allow to collect simultaneously to the CD data the H.T. applied on the P.M. photomultiplier tube. H.T. provides a direct information on CD data reliability, since at very high values CD results have no meaning.

H.T. is indeed proportional to the lighthrough of the system, so it can be used also to quantify the absorbance of the sample.

Since years Jasco is offering software to convert H.T. into Abs, so it's possible to obtain absorption spectra subtracting the Abs converted spectra of the blank to the Abs converted spectra of the sample.

More recently another opportunity has been offered, i.e. the possibility to collect, in place of CD, the DC voltage while keeping the H.T. constant. In this mode the spectropolarimeter operates as a conventional single beam, scanning, spectrophotometer.

Second choice is in principle more reliable, but it requires a separate run and more operator's skill, since H.T. must be manually adjusted (and often it's better to collect spectra in different regions with different H.T. values, to improve reliability).

Recently an updated driver of J-810 has been announced (Ver 1.09 and up) which allows to collect CD and Abs (in place of H.T.) at the same time. This will clearly simplify the operation, since data processing conversion is no more necessary. It's enough to collect sample and blank data (an operation anyway necessary) and subtract the CD and the Abs files separately.

A third option is in the use of the newly arranged UVD-445 double beam option. This is a major accessory including a beam splitter and a second photomultiplier tube. It converts de facto the unit into a double beam spectrophotometer.

This accessory is however expensive and can not be used in combination with large sampling devices.

The simultaneous direct Abs collection seems therefore the more logical approach, it's built in and costs nothing! It's also a valuable tool in melting experiments using Peltier or circulation cell holders. You can easily get in the same experiment CD and Abs melting data!

HPLC/CD experiments will benefit too from this option as well as from the new software built in facility to calculate the g factor.

But what about accuracy?

Systematic tests indicate that providing Abs level is within 2 Abs absolute error is within a few percent.

Cautions:

Since we are dealing with single beam measurements in the far UV it's essential to purge properly the unit with Nitrogen in a very reproducible way, otherwise data will be distorted by residual Oxygen absorption.