

Optical Rotary Dispersion Operating Procedure

I. Introduction. This document explains routine procedure for obtaining an ORD-E spectrum. It is assumed that the user has been trained on *Circular Dichroism Operating Procedure*. Please refer to that document for more information.

II. Precautions. Refer to *Circular Dichroism Operating Procedure* for precautions.

III. Instrument Startup.

- A. Turn the silver knob on the right of the machine to “ORD”.
- B. Turn on N₂ gas flow at the tank. It takes about 5 minutes to purge the compartments.
- C. Turn on the power to the spectrometer at the lower left front of the instrument.
- D. Start the Spectra Manager Program. There is only 1 instrument attached. Your choices of experimental measurements will be as follows:
 1. Spectrum Measurement to acquire a spectrum.
 2. Interval Scan Measurement.
 3. Variable Temperature. Measures the change in ORD with time at a fixed wavelength while the temperature changes. This is the typical program to use to obtain temperature scans in both directions.
 4. Temperature/Wavelength Scan. To obtain a temperature melt and spectra at designated temperatures. This is highly recommended for publication purposes.
- E. Select an experiment. At this time, a self-diagnosis will be performed. Wait until it is completed to proceed. A box will appear with the message, “HT value too small”. This is because you have not turned on the lamp. Select “Ignore” and continue.
- F. Once the main window has opened, go to “Control” then “Light source”. Check the box next to the lamp and click apply. This will turn the lamp on. Confirm the lamp is on by the green indicator light on the instrument. The lamp should warm up for a minimum of 5 minutes before use.

IV. Calibration.

- A. Ensure that the silver selection knob at the right of the instrument is set to “ORD”.
- B. The “Spectrum Measurement” program was selected above. Under “Measurement”, select the Parameters tab, set the wavelength between 180 and 700 nm, preferably in the region where you will obtain data.
- C. Under Measurement, Data Mode tab, select the following:
 - *Set Channel #1 to ORD-E (electronic, not magnetic).
 - *Set Channel #2 to HT.
- D. With no sample in the chamber, obtain a zero reading with the silver knob by the ORD/CD lever.

V. Data Acquisition.

- A. Only cylindrical sample cells should be used for ORD measurements.
 - B. Mount the sample in the sample chamber. Note the orientation of the cell.
 - C. Click [Start]. Data acquisition begins.
 - D. Upon completion of data acquisition, Spectra Analysis displays the results.
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- E. Obtain data for the blank. Ensure that you position the cell in the same position as your sample. The result will be displayed in Spectra Analysis upon completion.
- VI. Data Analysis in Spectra Analysis.
 - A. Subtract the blank from the sample data.
 - B. Save the results.
 - C. In Spectra Manager, double-click on [ORDE-E Data Correction]. A new window appears.
 - D. Load the sucrose data correction data from C:\data\ORD-ESucrose. See the *ORDE Data Correction Program*, page 5 for more information. The parameters are stored with the files.
 - *Suc300UCHSC = 1% sucrose.
 - *Suc500UCHSC = 5% sucrose.
 - *Suc700UCHSC = 5% sucrose.
 - E. Load the sample data (blank-subtracted) from the disk.
 - F. Execute data correction.
 - G. Save the results.
 - H. Print the results.
 - I. Shut down the system as usual.