

Circular Dichroism Spectrometer

model **410**

 Wavelength

 Temperature

 Titration

 pH

 Total Fluorescence



Introduction

Aviv Circular Dichroism Spectrometer, Model 410, records CD as a function of wavelength, time, temperature, pH and concentration using a double monochromator containing two UV grade prisms as dispersing elements. Right and left circularly polarized light is produced by a 50 KHz photoelastic modulator.

The instrument includes software by Aviv for instrument control, data acquisition, processing and publication quality presentations in a Windows environment. All experiment parameters are accessed through pull down menus. Control panels allow easy entry of all data acquisition parameters.

Smaller Size: Our smallest size ever, without compromising the performance. Fits on a table top or optional customized table.

Baseline Stability: Perform long-term experiments and be able to resolve small signal changes.

Specifications

Wavelength Range:

Range: 160 nm to 850 nm. Optional to 1200 nm

Stray Light: Less than 0.003% at 200 nm, less than 0.1% over operating limits.

Slit Program: Constant bandwidth from 0.01 to 15 nm. Automatic slit closure option to protect sample and optics from UV light.

Baseline Drift: Less than +/- 0.015 mdeg per hour after warm-up, providing environment is held at 24°C +/- 2°C.

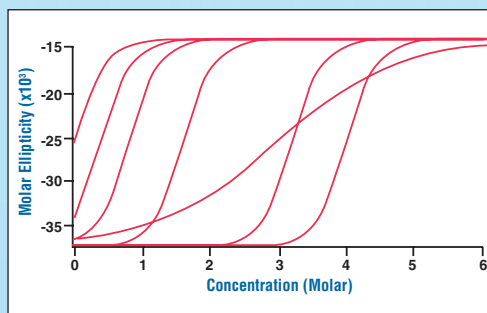
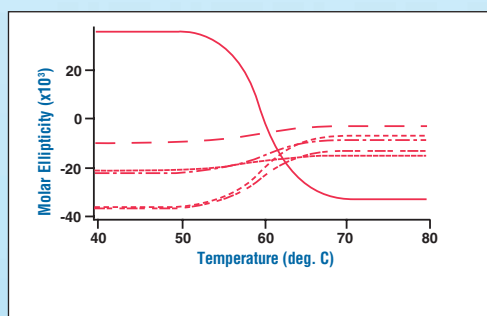
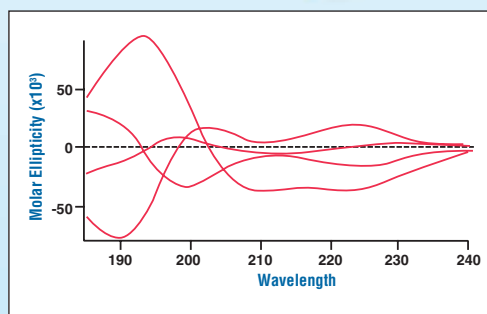
Light Source: Air cooled 150 Watt Suprasil Xenon lamp controlled by a high stability, constant current, DC power supply. Provides protections from loss of Nitrogen, lamp overheating, and EMF damage.

Automatic Proportionate Flow Control. Each compartment receives the appropriate nitrogen depending on its needs.

RMS Noise:

"Noise Less Than" with 1 nm Bandwidth:		
	4 sec. TC	16 sec. TC
185 nm	0.08 mdeg	0.05 mdeg
200 nm	0.06 mdeg	0.04 mdeg
500 nm	0.05 mdeg	0.035 mdeg

**NEW
feature**



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Experimental Modes

Wavelength: Records CD versus Wavelength at user selected bandwidth and averaging time. Data cannot be skewed by selecting improper scan speed.

Wavelength Schedule: User is allowed to enter a list of arbitrary wavelengths at which CD measurements will be made. Monitor critical wavelengths without the time of collecting the entire spectrum.

Temperature: Software control of thermoelectric device to maintain constant sample temperature, generate rising or falling temperature steps. Records CD versus temperature at fixed wavelength.

Temperature Schedule: A list of arbitrary temperatures can be entered at which CD measurements will be made. Speed through baseline regions while collecting fine temperature steps in the transition regions.

Kinetics: Measures changes in the CD signal as a function of time. Measures signal with time constants of tenths of seconds and longer.

Titration: The automated titration system option allows repeated injections of titrant under computer control. Possible experiments are ligand titration and solute induced denaturation. Handles large volume exchanges. Approach to Equilibrium option to monitor sample stability via CD or Fluorescence signal and automatically delay optical measurements until after chemical equilibrium is reached.

pH Titration: CD is measured as a function of pH. Syringe pump injects acid or base and pH meter measures changes in pH. A feedback loop automatically adjusts injection volumes to match changes in buffering capacity.

Macro Programs: Common instrument functions and experiment modes are available as commands that will automatically control the instrument. The Aviv Macro Command editor is graphically driven, intuitive and requires no programming experience. Every instrument is delivered with a library of programs, which include Multidimensional Experiments, special fluid handling and other automated functions.

Additional Signals: A multitude of additional signals can be recorded and saved in data files. These include dynode voltage, absorbance, fluorescence, fluorescence detected CD, photomultiplier current, raw CD signal, pH, injection volume, sample and titrant concentrations, jacket and probe temperatures, and fluorescence dynode.

Data Analysis

Direct transformation: All common math operations.

Fitting: Linear regression.

Statistics: Residuals, standard deviation, mean, median, smoothing and baseline correction. Molar Ellipticity and Absorbance calculations.

Protein Secondary Structure Analysis: Share-ware programs available from the Internet.

Data System

Pentium PC, current model, NETWORK READY • WINDOWS XP Operating System

Hard disk, CD RW, 3½" floppy disk drive, serial port, parallel port, 19" monitor, keyboard, mouse, multiple USB ports.

Multiple analog data acquisition channels and extended multiport RS 232 communications. Hewlett Packard DeskJet Printer (or equivalent).

Options

Thermoelectric Cell Holders: Thermoelectric Sample Holder, Sample Changer and Total Fluorescence Accessory include:

- Built-in, software controlled motor for a magnetic stir bar.
- Water Circulation to remove waste heat from Peltier Elements.
- Nitrogen purge for condensation and oxygen removal.
- Accepts 0.005 to 10 mm rectangular cuvettes.
- 0.01°C Resolution.

Thermoelectric Cell Holder: Single 1 cm cuvette. Range -10 to +110°C.

Thermoelectric Cell Changer: Rotary, 5 cuvettes. Range -5 to +110°C.

Total Fluorescence Accessory (with Thermoelectric Cell Holder): Collect total fluorescence signal and CD signal simultaneously. Software selectable. Includes single position thermoelectric temperature controlled cell holder described above. Right angle access port has light collecting mirror, cutoff filter and 1 inch photomultiplier with power supply added to collect total fluorescence. Cutoff filter easily changed. CD gives information about overall conformation while fluorescence gives information about local environment of fluorophores such as tryptophan at the same temperature. Range -10 to +110°C."

Fluorescence Detected Circular Dichroism (FD-CD): Measures the difference in fluorescent intensities when exciting with left and right circularly polarized light. Includes total fluorescence measurement capability.

Table: Customized table for mounting CD spectrometer and provisions for power supplies and Data System.

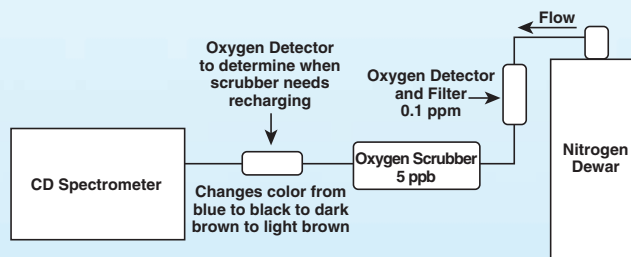
Automated Syringe Pump System: For titrations. Includes two 500 µl syringes, 10 mm cell, special titration adapter and stir bar. Highly repeatable programmable syringes for automated ligand titrations and solute induced denaturations. Can be used with single position thermoelectric cuvette holder or total fluorescence accessory. Accommodates the large volume exchanges.

Syringes for pump: 50 µl, 100 µl, 250 µl, 500 µl, 1 ml and 2.5 ml capacity available.

pH Measurement System: Includes pH meter and micro-probe electrode. Modified cuvette cap and electrode mount for 10 mm cell. Cables are included for complete system integration. pH range: 0 to 14 pH. Requires Automated Syringe Pump System.

Cell Holder: For water jacketed 22 mm cylindrical cells. Includes water lines mounted on its own door assembly with quick disconnects.

Nitrogen Purification System: Consists of rechargeable gas scrubber and two gas detection and filter assemblies. (Replacement cartridges available).



Nitrogen Dewar: 230 liter capacity.

Nitrogen Regulator: Oil free, 2 stage, nitrogen purge gas pressure regulator and adjustable flow meter. Fits standard gas cylinders and nitrogen dewars.

Holmium Oxide Solution: For wavelength calibration. NIST Certified.

Spare Xenon Lamp: XBO 150W/4 Suprasil, for 160-1200 nm.

Solid Sample Holder: Single V-Block for solid samples/thin film holder. (Holds up to six samples).

Fused Silica Cells, Strain-free

Rectangular Microcell with stoppers:

10 mm pathlength, 400 µl volume	2 mm pathlength, 80 µl volume
5 mm pathlength, 200 µl volume	1 mm pathlength, 40 µl volume

Spacer for microcell.

Rectangular Cells, Demountable:

0.5 mm pathlength	0.1 mm pathlength
0.2 mm pathlength	0.01 mm pathlength

Rectangular Cells: For reduced temperature induced birefringence; includes stoppers.

10 mm pathlength	2 mm pathlength
5 mm pathlength	1 mm pathlength

Cell Spacers: For use in Thermoelectric Cell Holder.

1 mm cell spacer	5 mm cell spacer
2 mm cell spacer	

For Fluorescence Measurements

10 x 10 mm, 45 mm high (One included with automated syringe pump).
5 x 5 mm, 21 mm high (Requires spacer. Cannot accommodate stir bar).
3 x 3 mm, 33 mm high (Requires spacer. Cannot accommodate stir bar).

Spacer for 3 x 3 mm pathlength cuvette.

Spacer for 5 x 5 mm pathlength cuvette.



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Note: All specifications subject to change without notice.