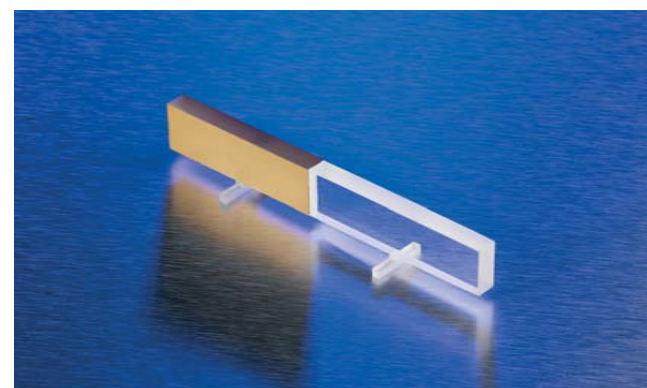


Innovative optical design
based on technical know-how and experience accumulated since 1961



The high intensity monochromator of the J-815 represents a significant breakthrough in CD performance. Utilizing natural crystalline quartz prisms to polarize the light during dispersion coupled with a carefully designed N₂ purge system allows the J-815 to penetrate down to the vacuum UV region of 163 nm. The increased throughput and high S/N ratio allows data collection much faster than ever before. The parallel sample beam through sample design eliminates focus related artifacts making sample placement a breeze and enabling easy measurement of highly scattering samples. JASCO's in-house Piezoelectric modulator temperature-stabilized provides remarkable long term stability eliminating instrument drift.

Four Channel Simultaneous Data Acquisition

Utilizable signals are CD, CD/DC, FD CD, ORDE, ORDM, LD, DC, UV(single beam), UV(double beam), Fluorescence, HT, Ext1, Ext2. Four Signals (two from internal and another two from external device) can be acquired and processed. e.g. CD, Abs(HT), Fluorescence and pH

Three Scanning Mode

Continuous Scan: Running average method offering high-speed measurement

Step Scan: Fixed wavelength method offering accurate wavelength (pure wavelength)

Auto Response Scan: Based on step scan but the response will change according to change on HT. This will enable the homogenized S/N in the wavelength range when spectral collection.



Versatility for a wide range of application requirements

- Protein folding studies
- Protein conformational studies
- DNA/RNA interactions
- Enzyme kinetics
- Organic stereochemistry studies
- Purity testing of optically active substances
- Quantitative analysis of pharmaceuticals
- Natural organic chemistry
- Biochemistry and macromolecules
- Metal complex chemistry
- Polymer chemistry
- Medical science
- Agrochemistry
- Physical chemistry
- Rapid scanning (time resolved) experiments



SPECIFICATIONS

Light source:	150W air-cooled Xe lamp or 450W water-cooled Xe lamp (factory option)
Detector:	Head-on photomultiplier tube
Modulator:	Piezoelectric modulator
Measurement wavelength range:	163 to 900 nm (standard detector) 163 to 1100 nm (optional detector)
Wavelength accuracy:	±0.2 nm (at 163 to 180 nm) ±0.1 nm (at 180 to 250 nm) ±0.3 nm (at 250 to 500 nm) ±0.8 nm (at 500 to 800 nm) ±2.0 nm (at 800 to 1100 nm)
Wavelength repeatability:	±0.05 nm (at 163 to 250 nm) ±0.1 nm (at 250 to 500 nm) ±0.2 nm (at 500 to 1100 nm)
Spectral Bandwidth:	0.01 to 15 nm
Slit width:	1 to 3000 μm
Response:	0.5 msec to 32 sec
Scanning system:	Continuous scan Step scan (Fixed response and auto response system)
Scanning speeds:	1 to 10000 nm/min (continuous scan)
Data interval:	0.025 to 10 nm (continuous scan) 0.1 to 100 nm (step scan) 0.5 msec to 60 min (time change)
CD full scale:	±10, 200, 2000 mdeg
CD resolution:	0.0005 mdeg (at ±10 mdeg full scale) 0.01 mdeg (at ±200 mdeg full scale) 0.1 mdeg (at ±2000 mdeg full scale)
Stray light:	Less than 0.0003% (200 nm)
RMS noise:	185 nm: 0.030 mdeg 200 nm: 0.015 mdeg 500 nm: 0.020 mdeg (Spectral bandwidth 1 nm, response 16 sec)
Baseline Stability:	±0.03 mdeg/hr (Spectral bandwidth 1 nm, response 32 sec, wavelength 290 nm)
UV measurement:	Single beam measurement Photometric range: 0 to 5 Abs Photometric accuracy: ±0.01 Abs
External input terminal:	Two channels (input range: -1 to 1 V)
Shutter:	Opens and closes in front of sample
Sample chamber:	140 (W) x 300 (D) x 130 (H) mm Large size chamber (factory option): 305 (W) x 420 (D) x 270 (H) mm
Nitrogen gas purge:	Atmosphere in the light source unit, monochromator unit, and sample chamber is displaced using dry nitrogen gas.
Dimensions:	1115 (W) x 570 (D) x 410 (H) mm
Weight:	87 kg
Power input voltage:	100, 115, 220, 230, 240 V, 50/60 Hz
Power consumption:	270 W

JASCO www.jascoinc.com

JASCO INCORPORATED

8649 Commerce Drive, Easton, Maryland 21601-9903, U.S.A.
Tel: +1-800-333-5272 Tel: +1-410-822-1220 Fax: +1-410-822-7526 Internet: <http://www.jascoinc.com>
Canada, Mexico, Puerto Rico, Argentina, Brazil, Chile, Colombia, Paraguay, Peru, Uruguay, Costa Rica

JASCO INTERNATIONAL CO., LTD.

4-21, Sennin-cho 2-chome, Hachioji, Tokyo 193-0835, Japan
Tel: +81-426-66-1322 Fax: +81-426-65-6512 Internet: <http://www.jascoint.co.jp/english/index.html>
Australia, China, Hong Kong, India, Indonesia, Iran, Korea, Malaysia, New Zealand, Pakistan, Philippines, Russia, Singapore, South Africa, Taiwan, Thailand

FT-IR ● UV-Vis ● Fluorescence ● Chiroptical ● Chromatography

J-815

Circular Dichroism Spectrometer

Leading the development of chiroptical instrumentation



Superior Performance
Superior Innovation
Superior Reliability

JASCO

J-815 Circular Dichroism Spectrometer

The latest effort to the JASCO commitment to lead the field of Circular Dichroism



JASCO proudly announces the new model J-815 Spectropolarimeter, our latest Circular Dichroism and UV/Visible absorbance research-grade chiroptical spectrometer. Unparalleled optical performance and optionally available measurement modes are combined in a manner to make the J-815 true "chiroptical spectroscopy workbench". Instrument control and data processing are handled effortlessly by our userfriendly and innovative cross- spectroscopy software platform, Spectra Manager™ II Software. As an option, Spectra Manager CFR provides secure access and compliance features for 21 CFR Part 11.

- Compact benchtop design
- Air cooled 150W Xenon lamp
- Highest Signal:Noise ratio
- Range of precise temperature control accessories
- Automated titration and stopped-flow accessories
- Spectra Manager II software for control and data analysis
- Spectra Manager CFR option for 21 CFR 11 compliance
- Fully supported by a range of cell holders, accessories and cells

Measurement modes and hyphenated Techniques

Circular Dichroism (CD)
Near Infrared CD (NIRCD)
Fluorescence Detected CD (FDCD)
Auto-Titration
Optical Rotatory Dispersion (ORD)
Magnetic Circular Dichroism (MCD)
Stopped-Flow CD (SFCD)
Double Beam UV
Circularly Polarized Luminescence (CPL)
Total Fluorescence (TF)
Linear Dichroism (LD)
Fluorescence Scanning with EM Monochromator
Chiral HPLC Detection (LCCD)

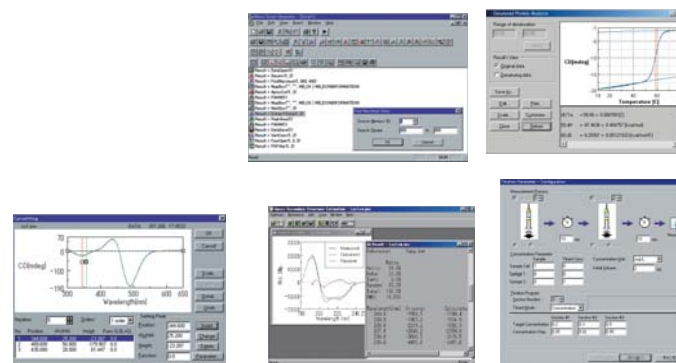


Optional accessories

Extended Wavelength Option
Peltier Cell Holder
Micro Cell Holder
FDCD Accessory
CD/Total Fluorescence Accessory
Em Monochromator
Automatic Titration Accessory
Stopped-flow Accessory
ORD Accessory
Linear Dichroism Accessory
Double beam UV Accessory
Cryostat
Electro-Magnet for MCD
LCCD Accessory

Optional software program packages

Secondary Structure Estimation Program
Deaenatured Protein Analysis Program
Multi-wavelength Variable Temperature Program
Curve-fitting Analysis Program
Macro Command Program
System Variation Program



Thermal Denaturation of Lysozyme with CD and Fluorescence Detection

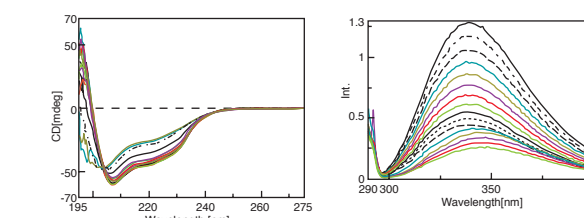


Figure 1. CD spectra demonstrating the thermal denaturation of lysozyme from 20 to 95°C.

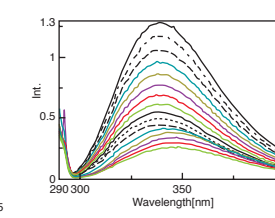


Figure 3. The fluorescence spectral change as lysozyme thermally denatures.

Hen egg-white lysozyme (1mg) was dissolved in 15 mL of deionized water. The thermal denaturation of the protein was evaluated using the JASCO J-810 CD spectropolarimeter equipped with the CDF-426S Peltier temperature controller and the FMO-427 emission monochromator for detection of fluorescence. The sample was contained in a 1cm quartz cuvette. Lysozyme CD and fluorescence spectra were automatically measured at 5^o intervals from 20-95^oC with the protein denaturation package. After the final measurement at 95^o, the sample was cooled back to 20^oC and a final set of spectra collected.

CD detection of Myoglobin Structure During an Automated pH Titration

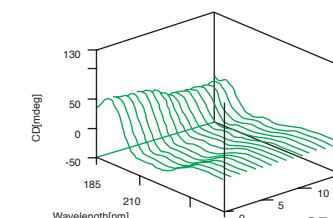


Figure 4. CD spectra demonstrating the spectral changes that occur with pH titration.

An 18 μ g/mL solution of myoglobin was prepared by dissolving horse skeletal muscle myoglobin in deionized water. Chemical denaturation of the protein was initiated by the addition of 0.1M Sulfuric Acid using the automated titrator (ATS-429). The protein unfolding was followed using the JASCO J-810 CD spectropolarimeter. The sample was contained in a 1cm quartz cuvette using a magnetic stirrer. Myoglobin CD spectra were automatically measured at 0.05 mL intervals. The totally automated study was completed in just under an hour. CD spectra were collected from 260/180 nm with a data pitch of 0.1 nm. A band width of 1 nm was used with a detector response time of 4 sec. and scanning speed of 50 nm/min.



Rapid kinetics (protein refolding) monitored by using stopped-flow/CD/Fluorescence

The JASCO Model J-810 CD spectrometer can be coupled with the Bio-Logic stopped-flow modules to provide high speed mixing for the study of kinetics and protein folding in both absorbance and fluorescence modes. The Bio-Logic stopped-flow modules can be equipped with either 2, 3 or 4 syringes each individually controlled by a stepping-motor which enables extremely precise delivery and millisecond dead times.

The measurement of the refolding of Cytochrome C

Cytochrome C is denatured (unfolded) using guanidine hydrochloride. It can be refolded by dilution of the guanidine hydrochloride with sodium phosphate buffer. This refolding process, (complete in approximately 300 msec) is monitored by simultaneous CD and fluorescence.

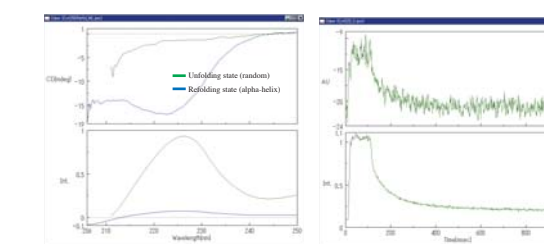
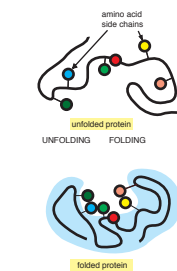


Figure 1

The kinetic trace at 222 nm (secondary structure region)

Figure 1 gives the CD and fluorescence spectra of Cytochrome c, showing the unfolded and refolded states, in the secondary structure wavelength region. A change in this region (225 nm) is largely due to the alpha-helical content. Figure 2 shows CD and fluorescence kinetic traces at 220 nm of when the Cytochrome C in guanidine hydrochloride (unfolded state) was mixed with the sodium phosphate buffer using the Biologic SFM-20 two syringe micro-volume stopped-flow.

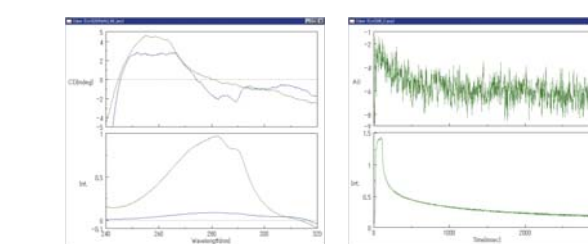


Figure 2

The kinetic trace at 289 nm (aromatic side chain region)

Figure 3 gives the CD and fluorescence spectra of Cytochrome C, showing the unfolded and refolded states, in the near UV (aromatic side chain) region. Changes in this region reflect changes in the local environment of the aromatic side chains and tryptophan residues. Figure 4 shows the CD and fluorescence kinetic traces at 289 nm. Cytochrome C is refolded in a mixture of guanidine hydrochloride and sodium phosphate buffer.