

J-1000 Series

Circular Dichroism Spectrometers

Model J-1500
Circular Dichroism Spectrometer

Model J-1100
Circular Dichroism Spectrometer



Jasco

JASCO Opens the Door to Future of CD

Chiroptical spectroscopy has become one of most important techniques for the characterization of biomolecules, determination of absolute configuration and stereochemical analysis. Since launching the Model AP-1, our first spectropolarimeter in 1961, JASCO has designed and built the finest in chiroptical instrumentation. Based on JASCO's experience in CD instrumentation over a half century, JASCO proudly introduces the J-1000 Series Circular Dichroism (CD) Spectrometers providing both unparalleled optical performance and versatile flexibility.

Model J-1500

**High performance CD spectrometer
for versatile measurements**



Model J-1100

**Compact CD spectrometer
for routine measurements**

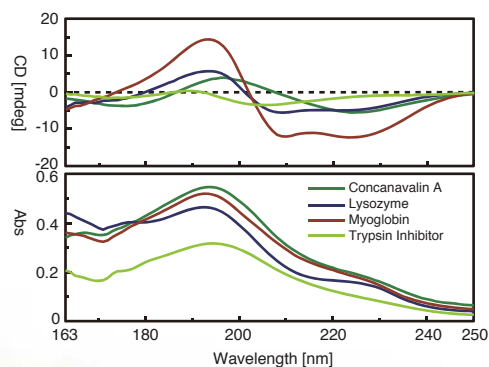


KEY FEATURES

- ✓ Wide spectral range from vacuum UV to Near-IR (up to 1600 nm, only J-1500)
- ✓ Standard built-in mercury lamp and optional NIST traceable standard sample for system validation
- ✓ High-efficiency purge capability enabling to enhanced vacuum UV measurement
- ✓ Extremely low stray light and high S/N ratio providing wide dynamic range
- ✓ High speed scanning (J-1500: 10000 nm/min, J-1100: 5000 nm/min)
- ✓ Simultaneous Multi-probe measurements (SMP) with acquisition of up to four data channels
- ✓ Flexible design allowing field upgrades for different measurement modes and accessories as applications evolve
- ✓ Spectra Manager II or Spectra Manager CFR (For FDA regulated labs): 64 bit innovative, cross-platform Spectroscopy Software Suite for data acquisition, analysis and presentation including several methods of secondary structure calculation

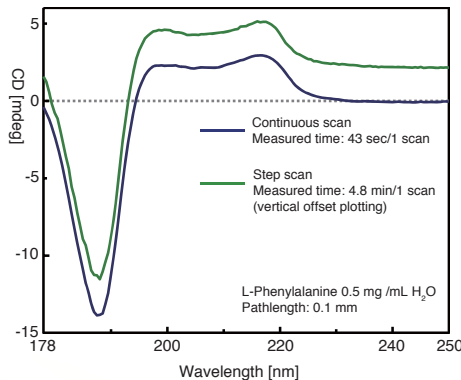
Excellent Instrument Performance

Enhanced Vacuum UV Measurement



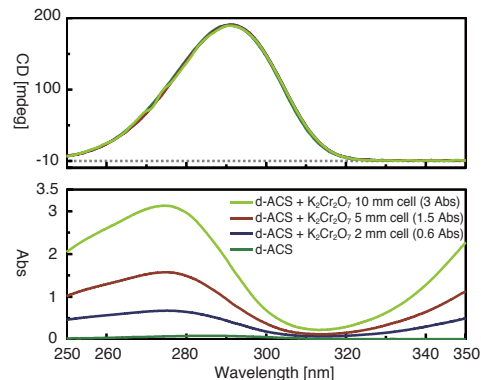
The innovative optical system of the J-1500 allows the measurement of a CD spectrum in the vacuum UV region down to 163 nm. The vacuum UV region below 200 nm, is of critical importance for biomolecules, particularly in protein secondary structure estimation. The data shows a CD and Abs spectra of various protein films, proving superior S/N ratio in the vacuum UV region below 170 nm.

Rapid Scanning



High sensitivity combined with a maximum of 10000 nm per minute scan speed allows the J-1500 to measure samples quickly increasing productivity in your lab. An additional benefit is the minimal time exposure of biological samples to the high-energy UV light minimizing the risk of sample degradation. The figure shows rapid spectral measurement of L-Phenylalanine solution. The measurement time was only 43 seconds per scan. Needless to say, no peak shift or spectrum distortion is observed even in such rapid scanning (see the CD spectrum by step scan mode for the comparison).

Exceptional Stray Light Rejection



Stray light will result in distortion of the CD spectrum, particularly in the Far-UV region where the sample absorbance is high. The dual polarizing prism optical design equipped in the J-1000 Series results in stray light lower than 0.0003% enabling them to obtain high quality CD data even under conditions with high absorbance. The figure illustrates that the CD spectrum of NH₄-d-10 Camphorsulfonate (d-ACS) is not distorted even with a sample of 3 OD (K₂Cr₂O₇, 273 nm, OD=3).

Performance, Reliability and Ease of Use

Validation and Data Confidence

JASCO Certificate of Analysis			
Description: (S)-(+)-10-camphorsulfonic acid ammonium salt			
Part Number: J1000-001			
Lot Number: 11111			
Analysis Date: 2012-08-01			
Storage Conditions: Room Temperature			
Quality Control Testing			
Substance	Meas. Property	Specification	Result
(S)-(+)-10-camphorsulfonic acid ammonium salt	[α] _D ²⁰ (c=1.0, water)	[α] _D ²⁰ (c=1.0, water)	Pass
Quality control test results are available in the J-1000 System Software Manual. The source of the specific random data is the following paper:			
1) T. Takahara, T. Kono, and H. Moriguchi, Analytical Sciences, August 1993 Vol. 1, p. 215			
Kazuo Kono General Manager of Quality Assurance Division			
4 th Issue 2012			
JASCO Corporation 2003-5, Shikama-cho, Hachioji-shi Tokyo 187-8502 JAPAN			

Certificate of Standard Sample

You can count on the accuracy and repeatability of your data collected on the J-1000 systems. An integrated validation mode provides a user-editable list of up to nine different tests of instrument performance and calibration. For wavelength accuracy and repeatability tests, each J-1000 system includes a built-in calibration light source. In addition, we can offer a Traceable Certified scale calibration substance (d-10-ammonium camphorsulfonate) for photometric accuracy and repeatability tests.

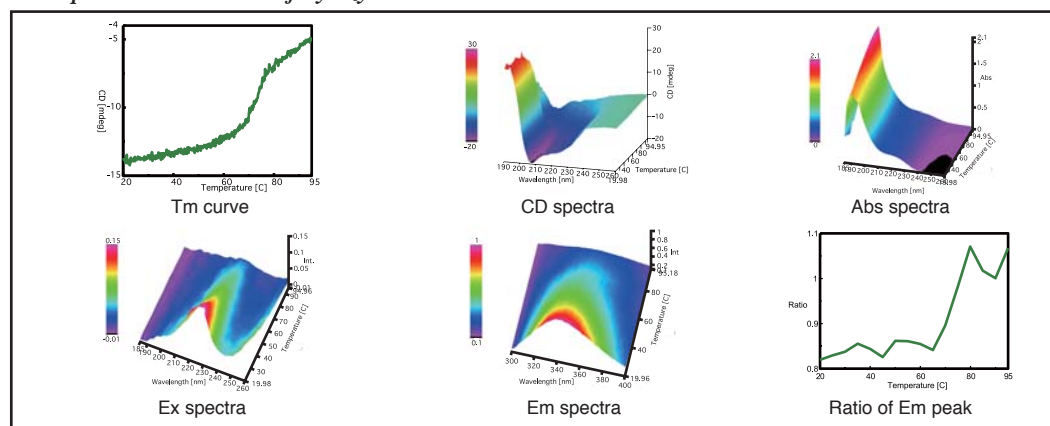
Simultaneous Multi-Probe Measurement (SMP)

The latest Quad Lock-in Amplifier allows the simultaneous acquisition of up to four data channels including CD, Absorbance, Linear Dichroism (LD), Fluorescence, Fluorescence detected CD (FDCD), Fluorescence detected LD (FDLD) and Fluorescence Anisotropy. The following figure shows the multi-probe measurement of Lysozyme showing the simultaneous acquisition of CD, Abs, Ex Fluorescence and Em Fluorescence during a thermal ramping experiment.

Multi-probe Measurement of Lysozyme



PTC-517 Peltier cell holder with emission optical unit and PML-534 high sensitivity FDCD detector



Broad Range of Measurement Options

Designed as a "Chiroptical Spectroscopy Workbench" the J-1500 offers a wide range of accessories to allow it to be adapted to any application requirements. Temperature ramping, protein folding, enzyme kinetics, DNA/RNA interactions, natural organic chemistry, biochemistry, macromolecules and rapid scanning experiments are all possible. The J-1100 offers the basic cell holders for general CD/LD/Abs and Temperature control measurements.

J-1500's Optional Accessories Line-up

- Peltier cell holders, single and six-position cell changers
- Micro sampling disk and Capillary jacket for measurement down to a few microliters
- Near-infrared extended detection to 1600 nm
- Highly-accurate ORD attachments
- High-sensitivity, artifact-free FDCD attachments
- Total Fluorescence and 90° light scattering
- Fluorescence Excitation/Emission scanning
- Fluorescence Anisotropy, Fluorescence Polarization
- Permanent and electro-magnets for Magnetic Circular Dichroism (MCD)
- Automatic titration system
- 2, 3 and 4-syringe stopped-flow systems
- High-throughput Automated CD system
- LD flow Couette cell holder
- Pressure-resistant high temperature measurement unit
- Solid sampling Diffuse Reflectance/Transmittance CD measurement units
- Liquid N₂ Cryostat
- Double-beam UV measurement unit



DRCD-574
Powder CD Measurement Unit



PM-491
Permanent Magnet, 1.6 Tesla



FDCD-550
Water Thermostatted
FDCD Measurement Unit



PTC-510
Peltier thermostatted Cylindrical/Rectangular
Cell Holder



MPTC-513
Peltier Thermostatted 6-position
Turret Rectangular Cell Changer

Specifications

Model:	J-1500	J-1100
Light source:	150W air-cooled Xe lamp (J-1500-150) or 450W water-cooled Xe lamp (J-1500-450)	150W air-cooled Xe lamp
Optional light source:	20W Halogen lamp, 150W air-cooled Hg-Xe lamp	-
Light source for validation:	Integrated Mercury lamp	
Detector:	PMT, ExPMT (option), InGaAs (option)	PMT
Monochromator:	Double prism polarizing monochromator	
Wavelength range:	163 to 950 nm (standard) 163 to 1600 nm (option)	180 to 600 nm
Wavelength accuracy:	±0.1 nm (163 to 250 nm) ±0.2 nm (250 to 500 nm) ±0.5 nm (500 to 800 nm) ±1.5 nm (800 to 950 nm)	±0.2 nm (180 to 250 nm) ±0.4 nm (250 to 500 nm) ±0.8 nm (500 to 600 nm)
Wavelength reproducibility:	±0.05 nm (163 to 500 nm) ±0.1 nm (500 to 800 nm) ±0.5 nm (800 to 950 nm)	±0.05 nm (163 to 500 nm) ±0.1 nm (500 to 600 nm)
Wavelength resolution:	0.025 nm	
Spectral bandwidth:	0.01 to 16 nm	1 nm
Slit width:	1 to 4000 μm	
Digital Integration Time (D.I.T.):	0.1 msec to 30 sec	8 msec to 8 sec
Measurement mode:	Continuous scan, Step scan, Auto-scan	
Scanning speed:	up to 10000 nm/min	up to 5000 nm/min
CD full scale:	±8000 mdeg	
CD resolution:	0.00001 mdeg	
CD dynamic range:	No CD distortion even with an OD=3 sample in the optical path	
Stray light:	less than 0.0003% (at 200 nm)	
RMS noise: (SBW 1 nm, 8 sec)	0.004 mdeg (185nm, 150W) 0.003 mdeg (185nm, 450W) 0.007 mdeg (200 nm) 0.007 mdeg (500 nm)	0.03 mdeg (200 nm) 0.03 mdeg (500 nm)
Baseline stability:	0.02 mdeg/hr	0.05 mdeg/hr
LD measurement:	Provided as standard, Full scale ±1 ΔOD	
UV measurement:	Provided as standard, Full scale up to 5 Abs	
External input terminals:	Two channels (input range: -1 to 1 V DC)	
Nitrogen gas purge:	High efficiency N ₂ purge with internal optimization for light source unit, monochromator unit and sample compartment	
Automatic recognition of accessory:	Standard	
Instrument communication:	USB 2.0	
Control and data processing:	Spectra Manager II or Spectra Manager CFR	
Sample compartment size:	150 (W) x 310 (D) x 165 (H) mm	105 (W) x 150 (D) x 110 (H) mm
Dimensions:	1055 (W) x 545 (D) x 390 (H) mm (J-1500-150) 1135 (W) x 610 (D) x 420 (H) mm (J-1500-450)	740 (W) x 545 (D) x 325 (H) mm
Weight:	77 kg (J-1500-150), 82 kg (J-1500-450)	70 kg
Power input voltage:	100, 115, 200, 220, 230, 240 V, 50/60 Hz	
Power consumption:	315 VA (J-1500-150), 685 VA (J-1500-450)	315 VA



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