Multiplelabs
Turnkey Laboratories Solutions

Analytical®
Technologies Limited

CDS - 3100

Circular Dichroism Spectroscopy

EPCC / PRODUCTS / APPLICATION / SOFTWARE / ACCESSORIES / CONSUMABLES / SERVICES

Analytical Technologies Limited

An ISO 9001 Certified Company

www.analyticalgroup.net

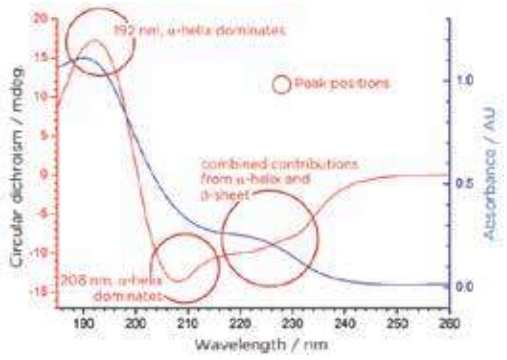
HIGH PERFORMANCE, READY TO RUN

- Determine structural and thermodynamic properties
  - Gain insight and detect changes in secondary and tertiary structure
  - Determine response to thermal or chemical changes
  - Study folding and unfolding mechanisms
- Achieve highest sensitivity and accuracy
- Generate highest quality data
- Optimize sample concentration and absorbance
- Expand capabilities with dedicated DCS accessories

DETERMINE STRUCTURAL AND THERMODYNAMIC PROPERTIES

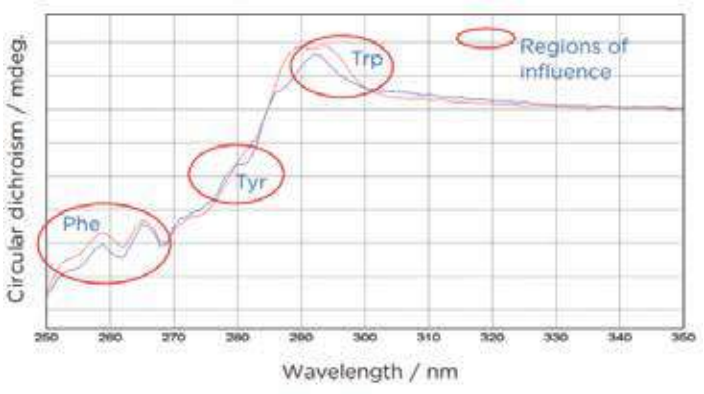
Gain insight and detect changes in secondary and tertiary structure

Secondary structure: far-UV spectrum of a globular protein



Simultaneous acquisition of CD and absorbance spectra, 0.5 mm path-length, DCS 3100. Courtesy of leading research university, Germany

Tertiary structure: near-UV spectra of two monoclonal antibodies



Differences between near-UV spectra due to slight changes in orientation of aromatic moieties, DCS 3100, 10 mm pathlength

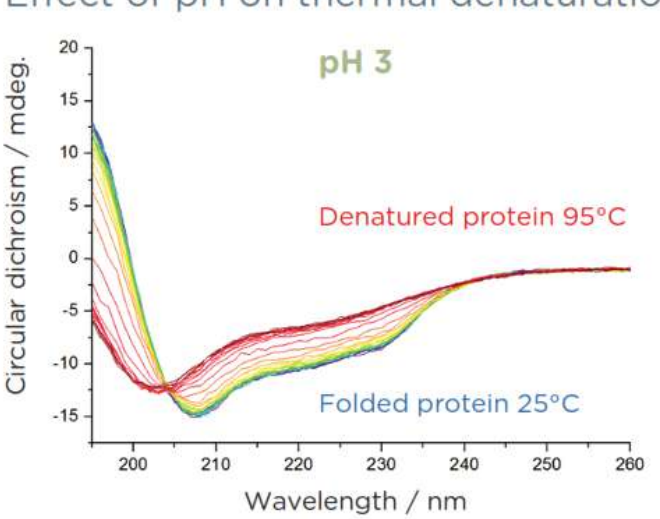
Determine thermodynamic properties – continuous thermal ramping

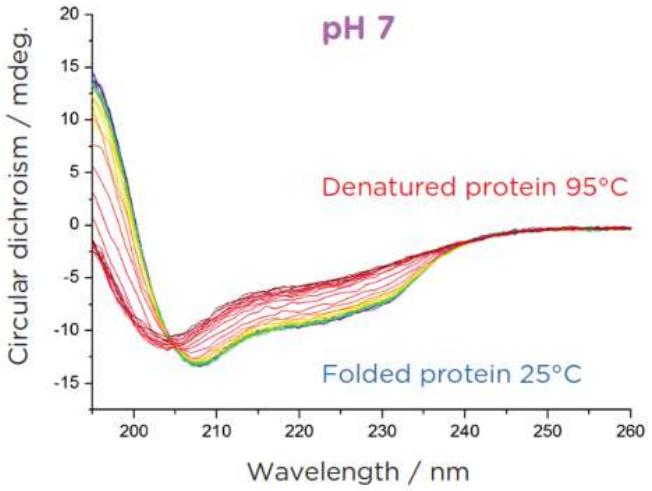
- Monitor at each wavelength
- Typical run: 70 spectra in 70 min, 1°C/min
- Record temperature directly – thermocouple in sample
- Derive melting points and enthalpies for multi ple thermal transitions
- Associate change in structure with each ther mal transition

pH	Melting temperature (°C)	van't Hoff enthalpy (kJ/mol)
pH 2	55.4	354
pH 3	69.4	385
pH 4	75.8	380
pH 5	76.9	400
pH 6	74.2	423
pH 7	72.7	367

Six datasets analyzed using Chirascan global thermodynamic analysis

Effect of pH on thermal denaturation





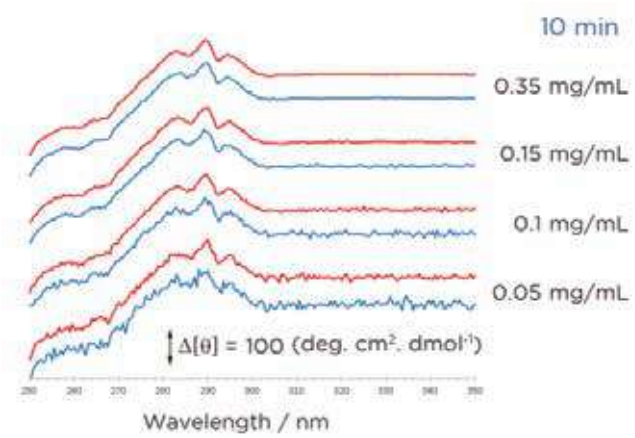
Two of six denaturation datasets acquired at pH 2-7, lysozyme, CDS 6-cell turret, CDS 3100, raw data, no baseline adjustment, no smoothing, 0.5 mm pathlength

ACHIEVE HIGHEST SENSITIVITY AND ACCURACY

Since their introduction in 2005, CDS systems have continued to feature in thousands of peer-reviewed publications covering a wide range of research areas. CDS 3100 now offers the increased sensitivity and accuracy preferred for CD analysis of biomolecules.

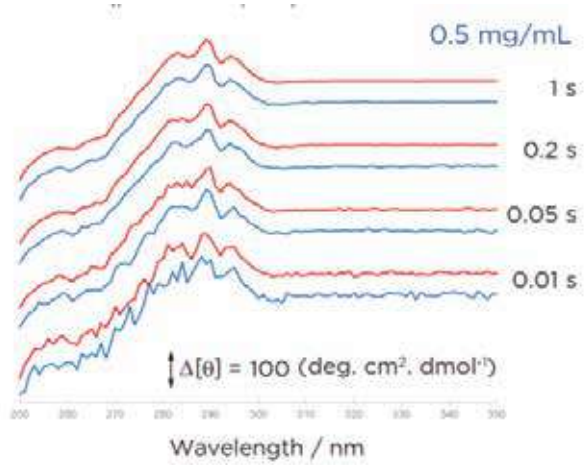
- Avalanche photodiode detector enhances sensitivity
- Increased signal:noise compared to conventional photomultiplier
- Accurate normalization from simultaneous measurement of absorbance and CD

Increased sensitivity when sample is limited



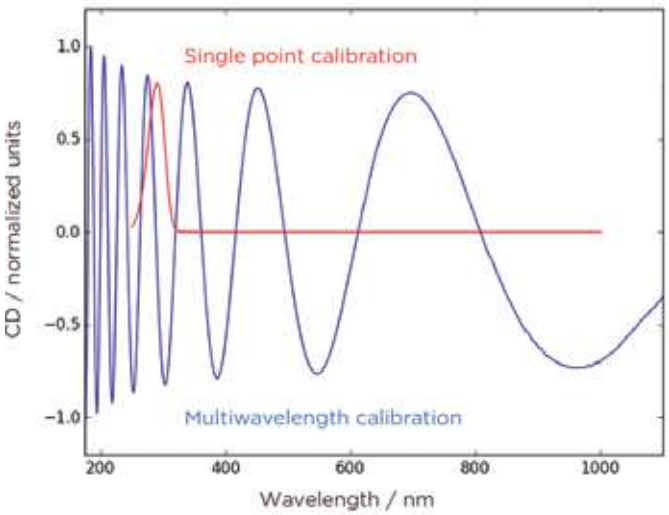
Tertiary structure of lysozyme – raw data, no smoothing, 10 min. baseline / 10 min. sampling, n=3 scans, 0.5 nm step, 10 mm pathlength, spectra offset for clarity

Increased sensitivity: faster measurements for thermal studies or photolabile samples



Tertiary structure of lysozyme – raw data, no smoothing, baseline corrected, n=3 scans, 1 nm step, 10 mm pathlength, spectra offset for clarity

- Accurate CD values across entire wavelength range
- Overcome challenges of chemical calibration
- Optics-based, multiwavelength calibration



Conventional chemical calibration methods require considerable skill in preparation. Standards, such as camphor-10-sulfonic acid (CSA), are unstable, photo-labile and hygroscopic. In addition, single wavelength calibration (290.5 nm) assumes the same linear response at all wavelengths. The optics-based, multi-wavelength calibration method used in DCS 3100 over-comes these challenges. The correct calibration is applied to every wavelength to yield accurate CD values.

READY TO RUN – GENERATE HIGHEST QUALITY DATA

DCS systems are supplied with features and accessories required for acquisition of high quality CD data – from built-in temperature control during analysis to cuvettes for the most common analytical conditions.* A basic training program follows installation to familiarize users new to DCS

PHOTOELASTIC MODULATOR

- Converts horizontally polarized light to circularly polarized light. Alternates between left- and right-handed circular polarized light

MONOCHROMATOR

- Produces horizontally, linearly polarized monochromatic light
- Two polarizing prisms maximize light throughput

AIR-COOLED XENON LAMP

- Software-controlled
- Up-time recorded

ACTIVE NITROGEN MANAGEMENT SYSTEM

- Regulates purge gas consumption
- Software-controlled

AVALANCHE PHOTODIODE DETECTOR

- Highest sensitivity (high signal: noise)

MOLECULAR SIEVE, ACTIVATED DCS FILTER

- Removes common gas impurities

Product Specification

Performance characteristics		
Spectral information	CD, absorbance as standard, Fluorescence and other detection modes available	
Isothermal analysis, typical measuring time	Full spectrum < 2 min	
Isothermal analysis, typical sample consumption	Secondary structure (far-UV), 0.5 mm pathlength, cell width 9 mm: mAb 0.06 mgTertiary structure (near-UV), 10 mm pathlength, cell width 10 mm: mAb 2.8 mg Tertiary structure (near-UV), 10 mm pathlength, cell width 4 mm: mAb 0.5 mg	
Thermal denaturation (thermal ramping)	Full spectrum per 1°C, continuous ramp rate 1°C/min	
Technical specifications	DCS3 3100	DCS
Light source	150W air-cooled Xenon arc lamp	
Monochromator	Two polarizing prisms to maximize light throughput	
Detection	Avalanche photodiode	Photomultiplier
Wavelength range Note: using quartz prisms within monochromator limit measurements to wavelengths > 163 nm	163 nm to 1150 nm Typical wavelength range for biomolecule analysis 180 nm to 350 nm	163 nm to 900 nm Typical wavelength range for biomolecule analysis 180 nm to 350 nm
Wavelength resolution	±0.1 nm	
CD calibration	Optics-based, multiwavelength Accuracy ±1% determined across wavelength range (selected wavelengths)	Chemical-based, single point
Measurement error on absolute absorbance	< 0.01 AU (simultaneous measurementof CD and absorbance signals)	< 0.1 AU
Bandwidth	160 nm: up to 2 nm 180 nm: up to 4 nm 200 nm: up to 7.5 nm 240 nm: up to 16 nm	
Bandwidth precision	±0.1 nm at 267 nm	
Stray light	< 3 ppm at 200 nm	
Typical Root Mean Square (RMS) noise values,no sample in place, 1 nm bandwidth, 2 s digital integration time – no smoothing, no rolling average	0.03 mdeg at 185 nm 0.03 mdeg at 250 nm 0.03 mdeg at 500 nm	0.045 mdeg at 185 nm 0.045 mdeg at 250 nm 0.055 mdeg at 500 nm
Baseline stability (16 h drift test)	< 0.4 mdeg	< 0.5 mdeg
Sample temperature during analysis,coolant at 15°C or above	Hardware tolerance: -20°C to +105°C Typical range for biomolecule analysis: 4°C to 95°C	
Data handling and storage		
PC operating system	Microsoft® Windows® 7 Professional, 64 bit	
Data storage and export	Storage in proprietary format, exportable as .csv	
Compliance		
Electrical safety and other regulatory requirements	EU legislation, Low Voltage Directive: 2014/35/EU Standard: IEC/EN 61010-1:2010.Standard: IEC/EN 61010-1:2010. USA National Registered Testing Laboratory (NRTL) under OHSA Federal code29 CFR 1910.7. Canada. Approval agency TUV-SUD. Standard: UL 61010 1:2012, CAN/CSA C22.2No. 61010-1:2012 EU Restriction of Hazardous Substances Directive (ROHS) 2011/65/EUStandard: EN 50581:2012 (Cat 9 Monitoring and control instruments) EU electromagnetic compatibility directive (EMC) 2004/108/EC Standard: IEC/EN 61326-1:2013 (EMC Class A Group 1)	
Physical and environmental specifications		
Instrument weight and dimensions (WxDxH)	60 kg, 150 x 55 x 60 cm	
Operating conditions: temperature	20 to 25°C controlled to within 1.5°C	
Operating conditions: humidity	20 to 80 % non-condensing	
Nitrogen requirement (flow rate, pressure, purity)	> 5 L per min, > 4 bar, > 99.998%	
Electrical requirements (Voltage, Frequency, Power)	100 to 240 VAC, 50/60 Hz, UPS rated to 1500 VA	

Analytical®
Technologies Limited

HPLC Servicing, Validation, Trainings and Preventive Maintenance :

HPLC Servicing :HPLC Servicing : We have team of service engineers who can attend to any make of HPLC promptly @the most affordable cost.

Trainings :We also take up preventive Maintenace to reduce downtime of HPLC's Trainings.

AMC's/CMC :AMC's/CMC :We offer user training both in-House and at customer sites on HPLC principles, operations, trouble-shooting.

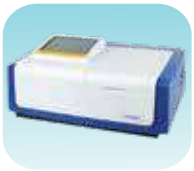
Validations :Validations :We have protocols for carrying out periodic Validations as per GLP/GMP/USFDA norms.

Instruments :Instruments :We offer instruments/Renting Services Modules like pumps,detector etc. on Rent.

About Analytical Technologies

Analytical Technologies is synonymous for offering technologies for doing analysis and is the Fastest Growing Global Brand having presence in at least 96 countries across the global. Analytical Technologies Limited is an ISO:9001 Certified Company engaged in Designing, Manufaturing, Marketing & providing Services for the Analytical, Chromatography, Spectroscopy, Bio Technology, Bio Medical, Clinical Diagnostics, Material Science & General Laboratory Instrumentation. Analytical Technologies, India has across the Country operations with at least 4 Regional Offices, 6 Branch Offices & Service Centers. Distributors & Channel partners worldwide.

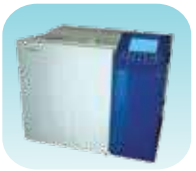
Our Products & Technologies



UV/VIS Spectro 2080+ Double Beam

Infra FTIR

Optima Gas Chromatograph 3007



Optima Gas Chromatograph 2979 Plus

Flash Chromatograph

Atomic Absorption Spectrophotometer

Liquid Partical Counter

Optical Emission Spectrophotometer

DSC/TGA

Semi Auto Bio Chemistry Analyzer

HEMA 2062 Hematology Analyzer

Micro Plate Reader/Washer

URINOVA 2800 Urine Analyzer

Total Organic Carbon 3800

Fully Automated CLIA

NOVA-2100 Chemistry Analyzer

PCR/Gradient PCR/ RTPCR

TOC Analyzer

Laser Particle Size Analyzer

Ion Chromatograph

Water purification system

Regulatory compliances

Corporate Social Responsibility

Analytical Foundation is a nonprofit organization (NGO) found for the purpose of:

1.Research & Innovation Scientist's awards/QC Professional Award : Quality life is possible by innovation only and the innovation is possible by research only, hence ANALYTICAL FOUNDATION is committed to identify such personallities for their contributions across various field of Science and Technology and awarding them yearly. To participate for award, send us your details of research / testing / publication at Info@analyticalfoundation.org

2. Improving quality of life by offering YOGA Training courses, Work shops/Seminars etc.

3. ANALYTICAL FOUNDATION aims to DETOXIFY human minds,souls and body by means of yoga, Meditation, Ayurveda, Health Care, Awards, Media, Events, Camps etc.

Analytical®
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