

Specification

Light source	150W Ozone-free air-cooled Xe lamp (Option:150W air-cooled HgXe lamp)
Detector	Head-on photomultiplier tube PMT
Modulator	Piezoelastic modulator
Electrical system	Lock-in amplifier
Monochromator	Double prism monochromators for both Ex (excitation) and Em (emission) parts
Measurement wavelength range	250 to 850 nm 400 to 1100 nm (optional PMT detector)
Wavelength accuracy	±0.2 nm (250 to 500 nm) ±0.5 nm (500 to 800 nm) ±1.5 nm (800 to 1100 nm)
Wavelength reproducibility	±0.05 nm (250 to 500 nm) ±0.1 nm (500 to 800 nm) ±0.5 nm (800 to 1100 nm)
Slit widths	1 - 4000 μm
Digital Integration Time (D.I.T.)	0.1 msec to 30 sec
Scanning mode	Continuous scan, Step scan, Auto response (D.I.T) scan
Scanning speed	up to 10000 nm/min
Photometric Mode	CD (AC component = CPL), DC (DC component = Fluorescence), HT (High tension voltage of PMT), and AC/DC
CPL resolution	0.00001 mdeg
Wavelength resolution	0.025 nm
Stray light	0.001% or less
External input terminal	Two channels (input range: -1 to 1 V DC)
Mercury lamp	Used for the instrument calibration
Shutter	Located on the Ex and Em monochromators
Sample chamber	150 mm (W) x 310 mm (D) x 165 mm (H)
Dimension	2000 mm (W) x 700 mm (D) x 1000 mm (H)
Weight	180 kg
full scale	± 8000 mdeg
Power	100 - 240 V 50/60 Hz, 400 VA
Program package	Spectra Manager Ver.2

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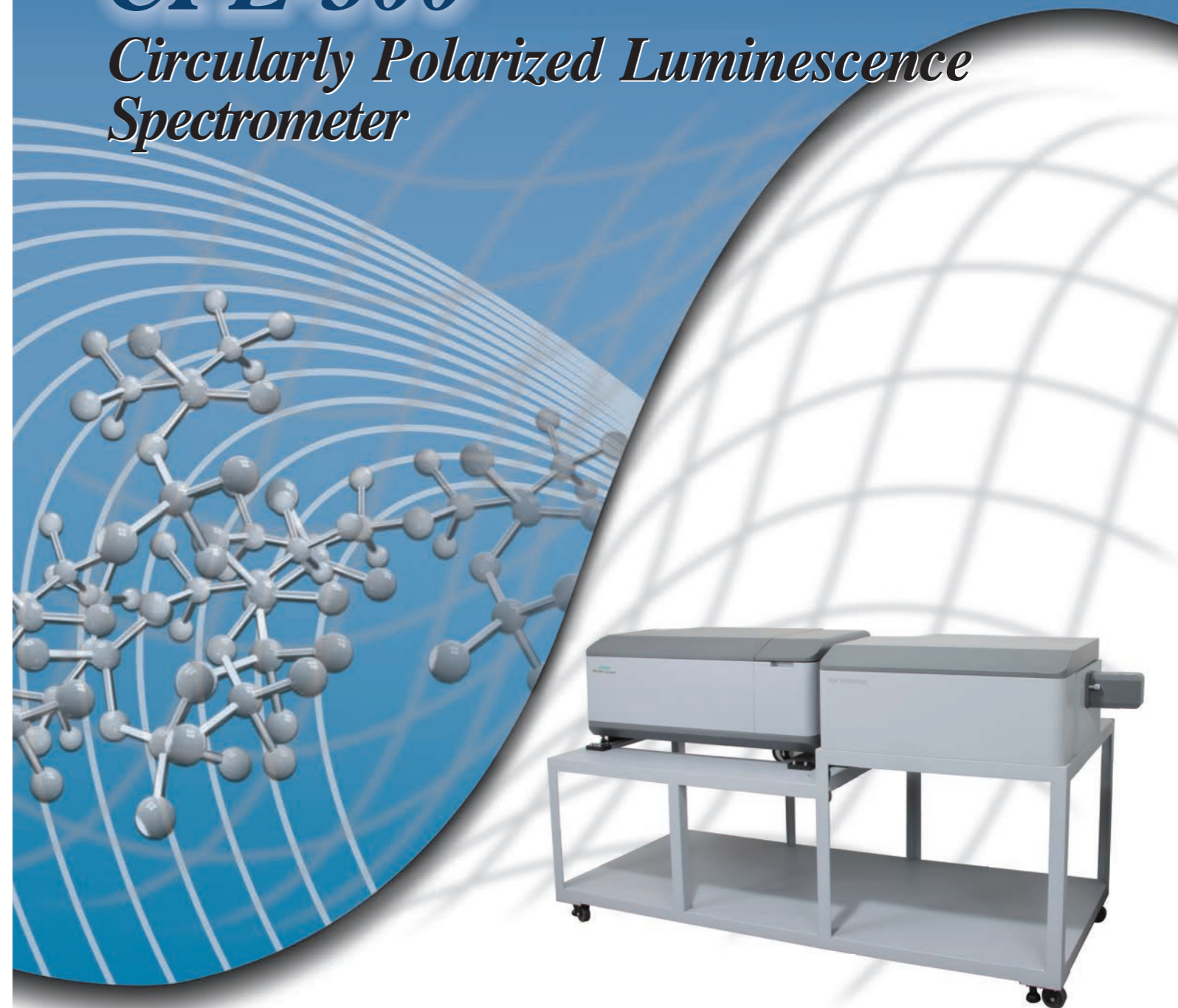


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MADE IN TOKYO, JAPAN

CPL-300

Circularly Polarized Luminescence Spectrometer

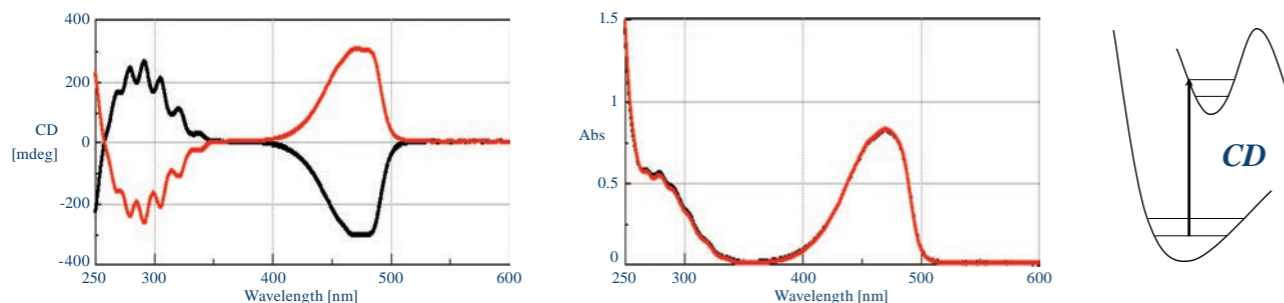


JASCO provides the solution for next chiral technology

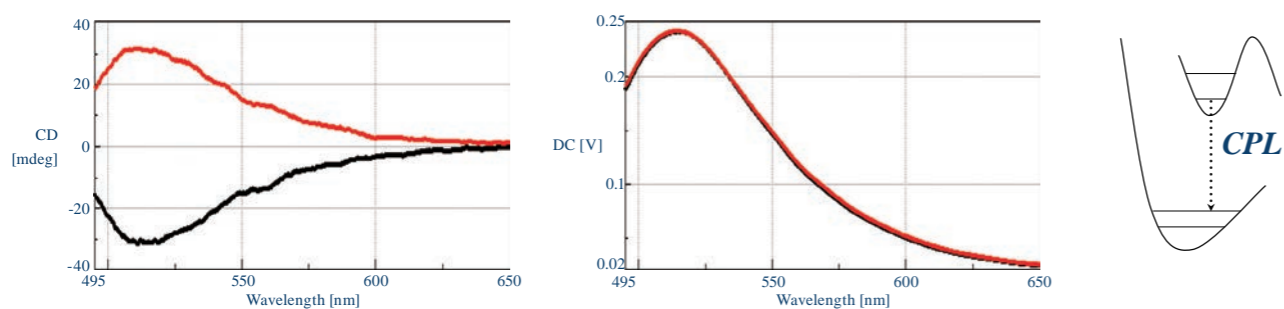
Circularly Polarized Luminescence (CPL) gives different/complementary information to other chiroptical techniques such as ORD, CD, VCD and ROA, since it reflects the structural properties of the first excited state.

In addition emission properties may be more interesting than the absorption ones, particularly in the field of new materials research, where emission features have more technological impact. Lastly theoretical calculations for the excited chiral molecules are now possible, due to the increasing computational power in several laboratories. All these factors contribute to the growing interest toward this technique.

CD and absorbance spectra of Camphorquinone (measured by J-1500)



CPL and Fluorescence spectra of Camphorquinone (measured by CPL-300)



Features of optical system

JASCO has developed the CPL-300 which uses the original 180° fluorescence collection approach proposed originally by Steinberg in the early seventies.

Light sources

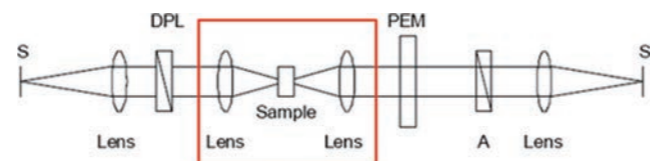
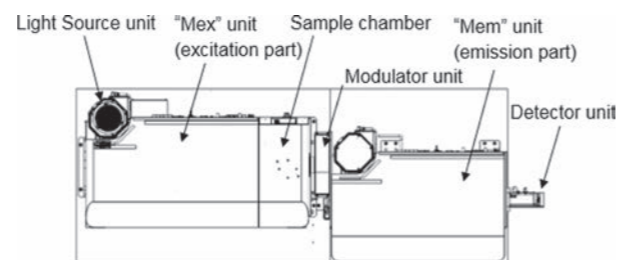
The standard ozone free 150W Xe lamp can be easily user replaced with an Hg/Xe source, allowing stronger excitation flux at the several wavelengths where Hg emission lines are present.

Excitation optics

CPL-300 features a double prism excitation monochromator, with very low stray light and no linear polarization effects caused by diffraction gratings.

Emission optics

In the CPL-300 this is obtained using a double prism monochromator, linearly polarizing type, to avoid the spectral range limitations of linear polarizers placed after the photoelastic modulator. Here too the prism approach assures better data, since no second order radiation will be detected and no Woods anomalies are present.



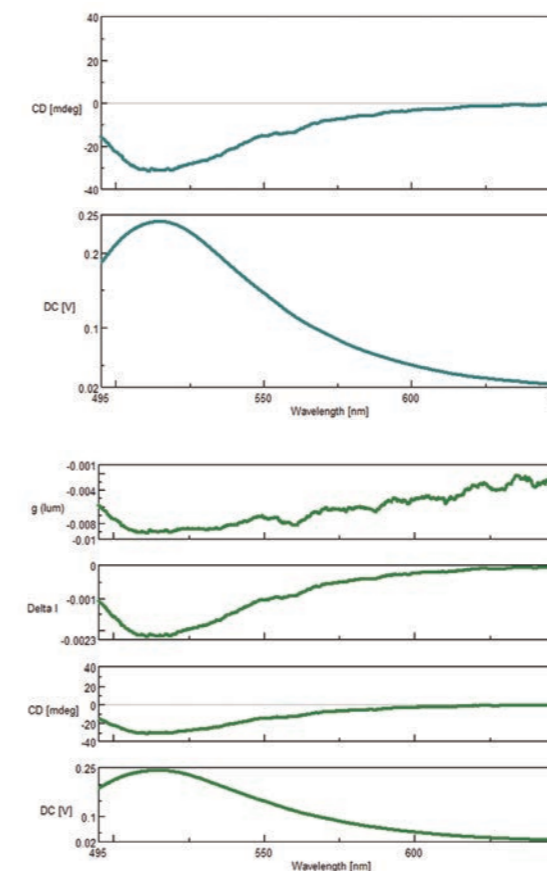
Data collection and processing

CPL is evaluated by the difference between left and right circularly polarized radiation intensities emitted by the sample.

With CPL-300 two data are simultaneously collected while keeping the photomultiplier tube at a constant gain (fixed high voltage):

- CPL as the demodulated AC component, in millidegrees of ellipticity,
- Fluorescence intensity (I) from the DC signal (in volts)

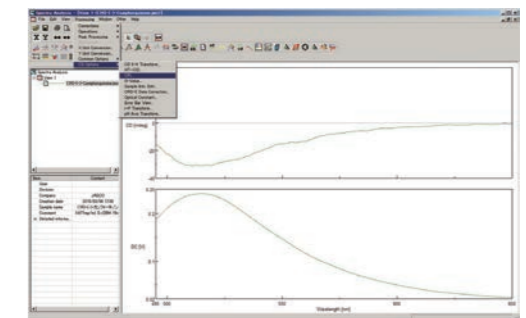
Above two data can be converted to the g factor, which gives a useful information in analysis. All these operations are fully supported by the dedicated software of the CPL-300.



Data processing of CPL and Fluorescence spectra (Sample: (1R)-(-) Camphorquinone)

Top: Raw data

Bottom: Result of calculating g_{lum} as $\Delta I/I$



JASCO's unique sampling accessories

As standard unit is provided with sample holder for both rectangular and cylindrical quartz cells. The beam is focused at the centre of the compartment. In the CPL-300 there is the freedom to use 90° geometry too, using low cost dedicated monochromatic excitation beams, directly prepared by the user. These may be CW gas or diode lasers as well as commercially available LEDs. The sample compartment has predrilled holes for such an application.

In addition, many optional accessories, as available for the JASCO J-1500 CD spectrometer, which uses the same sample compartment, can be added.



EXPM-531
NIR extended PMT
(up to 1100 nm)



PTC-517
Peltier thermostatted
rectangular cell holder with
stirrer



PM-491
Permanent magnet, 1.6 T



CRY5-582
Liquid Nitrogen Cryostats
for solid sample