Sensitive. Accurate. Flexible.

AGILENT CARY ECLIPSE FLUORESCENCE SPECTROPHOTOMETER

The Measure of Confidence

Agilent Technologies

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Agilent Technologies is now your premier resource and partner for molecular spectroscopy. With the addition of the world-renowned Cary product line, encompassing FTIR, UV-Vis-NIR and Fluorescence, Agilent offers you a comprehensive range of molecular spectroscopy solutions.

Answers you can trust

The Agilent Cary Eclipse fluorescence spectrophotometer is sensitive, accurate and flexible, and is designed to meet your immediate and future challenges. With accurate temperature control, no sample photobleaching, and a range of measurement options, you can be sure that the Agilent Cary Eclipse will give you answers you can trust.

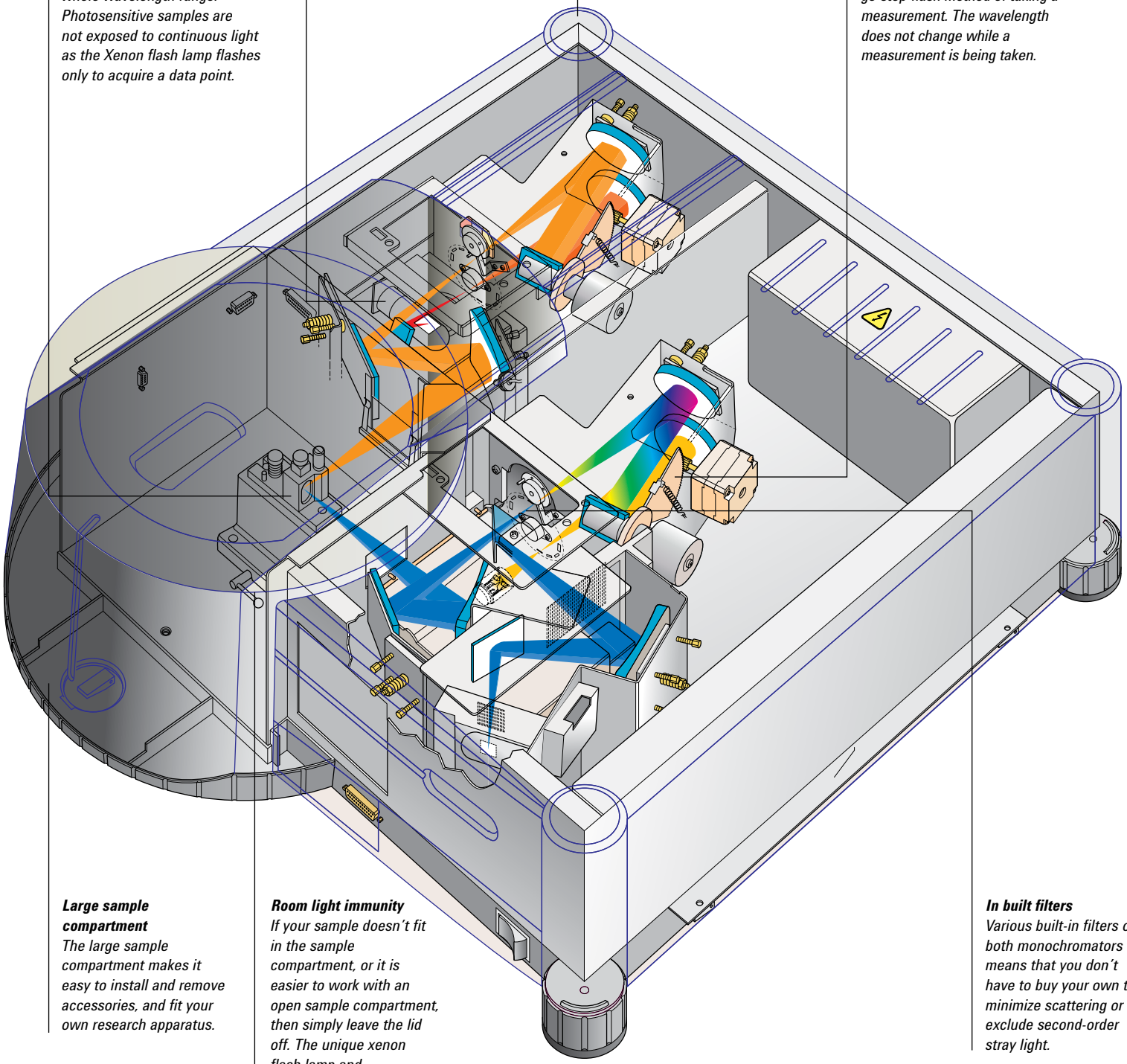
- Lowest cost of ownership — with an exceptionally long lifetime of 3 billion flashes, the lamp typically lasts 10 years, minimizing lamp replacement and saving you money over the lifetime of the instrument
- No need for cuvettes — the optional fiber optic probe delivers accurate results in a fraction of the time, improving your workflow and reducing your costs
- Exceptionally fast data collection — with a scan rate of up to 24,000 nm/min, you can scan the entire wavelength range in under 3 seconds and collect at 80 points/sec for kinetics measurements
- Sensitivity — detect picomolar amounts of fluorescein in both standard and micro cuvettes
- Measure precious or biological samples with ease — the xenon flash lamp enables highly sensitive measurements on small volume samples to be made without sample degradation
- Flexibility — choose from fluorescence, phosphorescence, chemiluminescence or bioluminescence collection modes, to provide a robust and versatile workhorse for all your analytical needs

Superior optical design
Excellent sensitivity is a result of using a unique, intense xenon flash lamp, coupled with optimized grating blaze angles and coatings which ensure sensitivity across the whole wavelength range. Photosensitive samples are not exposed to continuous light as the Xenon flash lamp flashes only to acquire a data point.

Extended sensitivity
Red-sensitive Photomultipler tube detectors extend sensitivity up to 900 nm without sacrificing UV performance.

Small footprint
The Cary Eclipse occupies only 600 mm (24 inches) of bench space.

Fast scanning
The Cary Eclipse scans at 24,000 nm/min without peak shifts due to the monochromator drive mechanism design. The grating is moved only when the lamp is off, resulting in a go-stop-flash method of taking a measurement. The wavelength does not change while a measurement is being taken.



Large sample compartment
The large sample compartment makes it easy to install and remove accessories, and fit your own research apparatus.

Room light immunity
If your sample doesn't fit in the sample compartment, or it is easier to work with an open sample compartment, then simply leave the lid off. The unique xenon flash lamp and sophisticated signal processing gives the Cary Eclipse room light immunity for fluorescence measurements.

Measure micro volume samples
Reduced volume cuvettes as low as 5 µL are available. The horizontal beam profile ensures excellent sensitivity even with such low volumes.

Super-fast data collection
Scan the whole wavelength range in less than 3 seconds.

In built filters
Various built-in filters on both monochromators means that you don't have to buy your own to minimize scattering or exclude second-order stray light.

accurate

QUALITY AND PERFORMANCE BY DESIGN

Our proven record of optical design excellence and innovation ensures you get the right answer every time.

The power of xenon

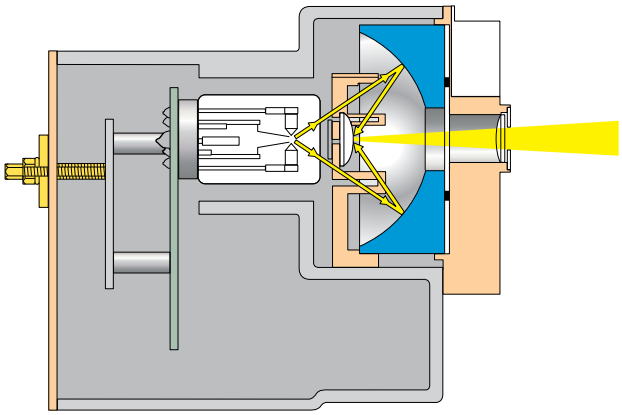
With unique xenon flash lamp technology, the Agilent Cary Eclipse is:

- Room-light immune — the unique optical design enables measurements to be made with the sample compartment open, allowing large or odd-shaped samples to be measured
- Flexible — the highly-focused beam provides superior coupling to fiber optics, making the Agilent Cary Eclipse the best choice for fluorescence fiber optic measurements
- Efficient — the lamp only flashes when a reading is taken, resulting in zero warm-up time and very low electrical energy use and maintenance requirements. Photodegration is also eliminated, as photosensitive samples are not excessively exposed to light

Signal to noise

Signal-to-noise (S:N) mode is a unique scanning mode available only on the Agilent Cary instruments that enables you to control the level of precision you want across the whole scan. It is particularly useful for samples that vary significantly in emission intensity across the wavelength range.

S:N mode reduces scanning times by over 50% as the system scans quickly in areas of high emission intensity and increases signal averaging when the emission is less.



Superior optics

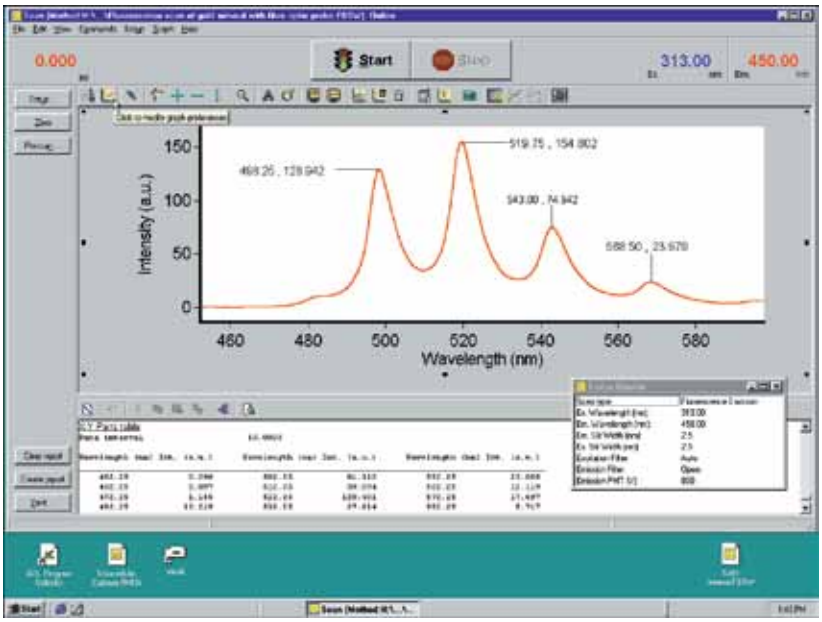
The Schwarzchild collection optics capture a large portion of the light from the powerful xenon flash lamp and direct it through the sample, resulting in excellent sensitivity and low signal noise.

DISTINCTLY BETTER SOFTWARE

User friendly, application focused software provides complete instrument control.

Software designed for real samples

The modular design of the Agilent Cary WinFLR software means that it can be tailored to suit your analytical requirements — whether it's a chemical application using basic scan or concentration measurements, or life science applications requiring advanced polarization or thermal control.

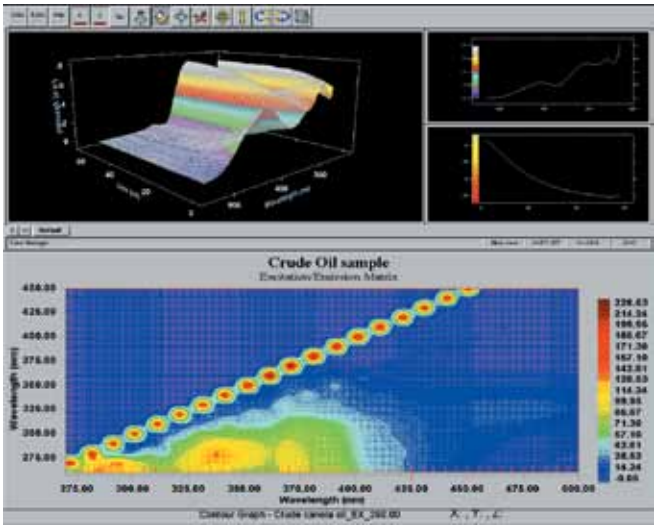


Dedicated software applications
Streamline your measurements and save time with the easy-to-use WinFLR software. Investigate intra-cellular ion transfer processes using the Fast Filter module or study drug binding assays using kinetics and polarization.

Enhanced graphics features
The graphics control module has automatic peak labelling, zoom, free and tracking cursor, multiple ordinate and abscissa formats, smart copy/paste and overlay modes, making spectral interpretation and presentation for publications a breeze.

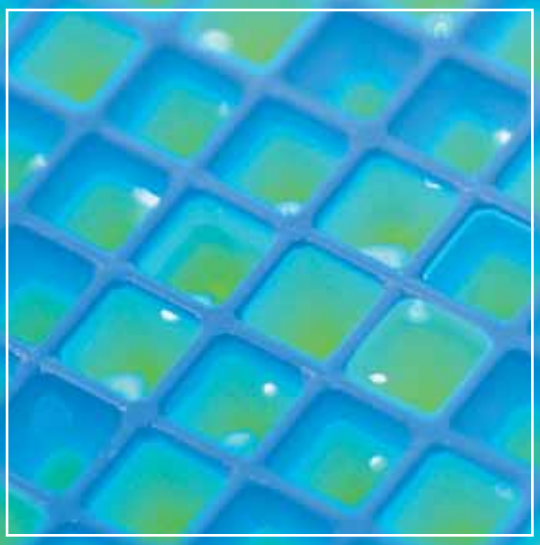
Advanced data processing
Use the spectrum calculator to apply mathematical operations, including addition, subtraction, division, multiplication, log and square root functions, to spectra. The calculator also features mean, normalization, smoothing, up to fourth order derivatives, and integration algorithms.

Meet your application challenges
Use the powerful built-in Applications Development Language (ADL) to tailor the WinFLR software to meet your most specific applications.



Obtain 3-D graphs and contour plots in seconds
Automatically collect a series of excitation, emission or synchronous scans in all x modes. The 3-D data can be sliced to produce single excitation or emission scans, or contour plots can be created to show the number of emitting species.

flexible



YOU CAN DO IT ALL WITH A CARY

Agilent Cary Eclipse fluorescence spectrophotometers are complemented by a range of accessories and software designed specifically for your application needs.

Performance enhancing accessories

The vast range of accessories for the Cary Eclipse ensures you can handle the widest variety of sample sizes and types.

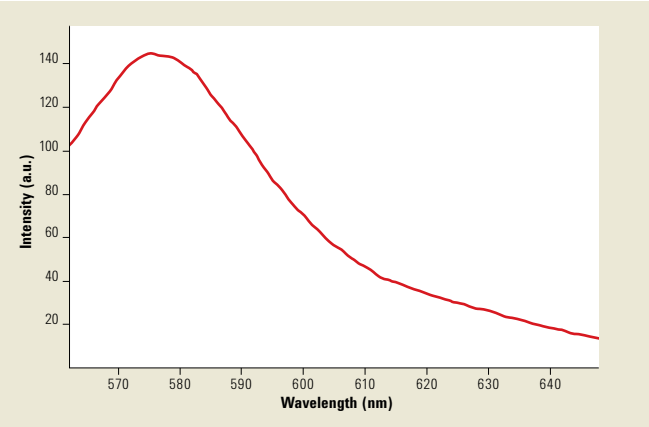
Accessories for liquid samples

- Microplate reader for method development or high throughput measurements
- Fiber optic probes and couplers for fast accurate measurements without cuvettes
- Peltier and water thermostatted single and multicell holders for precise temperature control
- Temperature probes for accurately measuring the temperature inside the cuvette
- Rapid mix accessory for investigating ultra-fast kinetics measurements that are over within seconds
- Manual and automated polarizers for excitation down to 275 nm

Accessories for solids, powders and pastes

- Solid sample holder to acquire fluorescence spectra of a variety of sample types, including filters, powders, gels, optical components and fabrics
- Fiber optic reflectance probe and coupler

Monitor temperature control
The temperature probe enables the temperature inside the cuvette to be measured, providing the most accurate data for temperature dependent experiments. The WinFLR software monitors the temperature directly from probe, ensuring data is collected at the correct temperature.



Scan cells adhered to wells
The microplate reader can easily scan cells adhered to the side of a well, with excellent signal to noise. This figure shows an emission scan of Rhodamine B which has been coated to the side and bottom of a 384 well white microplate.

High throughput microplate reader

The microplate reader accessory turns the Cary Eclipse into a high throughput microplate reader in less than 30 seconds. It provides full wavelength scanning with excellent sensitivity using reflective optics instead of fiber optics.

- Measure 96 wells in less than 50 seconds and 384 in less than 90 seconds
- Perform full wavelength scans on each well within minutes. Measure in steady-state fluorescence, phosphorescence, bio-/chemi-luminescence or time-resolved delayed fluorescence modes
- Measure minute sample quantities deposited on the sides or base of the wells.
- Customize the measurement positions for non-standard microplates or substrates. Control the image spot size to as small as 2 mm in diameter
- Automatically align the excitation beam on your microplates and store information about each plate type
- Use the microplate reader as an x-y transport to measure other samples such as gels, films, and solids at various locations on their surface

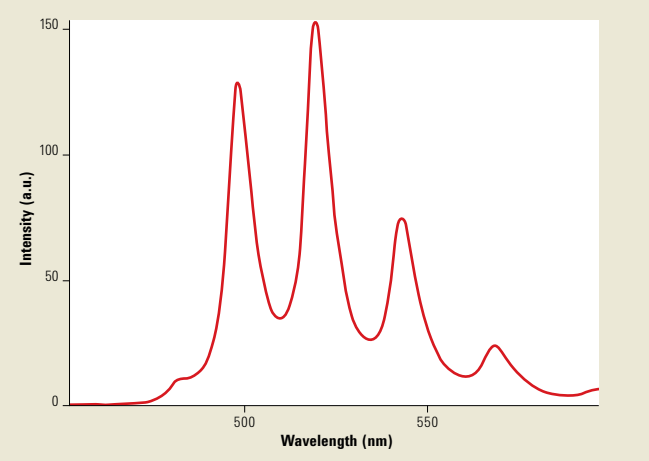
CHEMICALS AND MATERIALS APPLICATIONS

When you need to consistently and cost-effectively deliver the highest quality finished products and materials, innovative, reliable analytical solutions are essential to your success. The Agilent Cary Eclipse enables minimal sample preparation and versatile sampling solutions.

Flexible sampling

Combine the Agilent Cary Eclipse with fiber optic probes to create the most sensitive, remote-reading fluorescence spectrophotometer available:

- Use the fiber optic system to measure emission from the surface of a solid or from a liquid
- Unique feature of fluorescence room light immunity means there is no restriction on sample size or shape



Fiber optics measurements
The Cary Eclipse fiber optic system can be used to measure the emission from the surface of a solid or that emitted by a liquid, without compromise in data quality.

Superior scanning

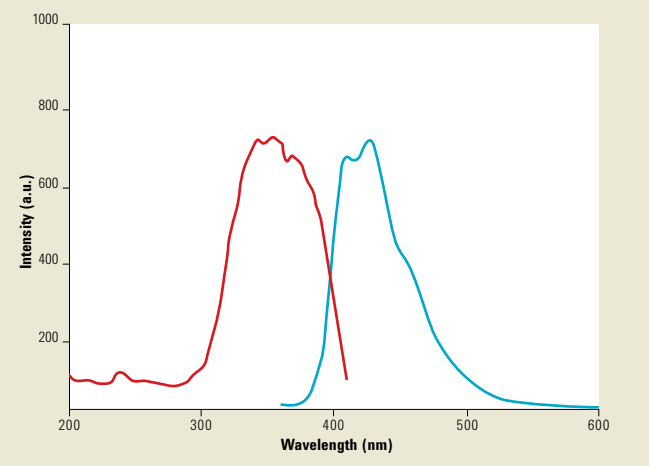
- Rapid scan rate of 24,000 nm/min without peak shifts is due to the design of the monochromator drive mechanism. The grating only moves when the lamp is off, resulting in a go-stop-flash measurement method — the wavelength does not change whilst a measurement is being taken
- Use Computer Averaging of Transients (CAT) scan mode to average a number of individual scans until you are satisfied with the signal to noise quality
- Corrected excitation and emission spectra up to 600 nm are provided at no additional cost

Solid sample measurements
Use the solid sample holder to easily measure the fluorescence properties of a variety of sample types — from optical filters to specialty chemicals such as optical brighteners, optical components, paints and fabrics.

Fluorescence measurement of detergents

Use the Cary Eclipse fluorescence spectrophotometer with solid sample holder to measure the fluorescence of optical brighteners in laundry detergents.

- Solid sample holder is easy to install and align, minimizing sample preparation.
- Use in combination with the powder holder and edge mounting kit for even greater solid sampling flexibility.
- Acquire spectra with the sample compartment open.

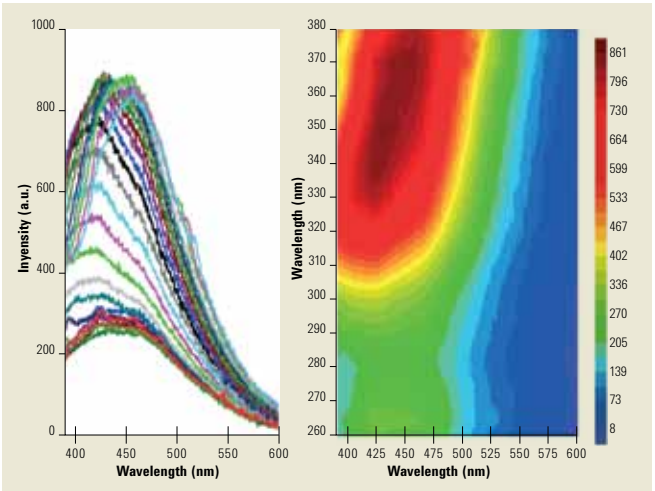


Examine the fluorescent properties of a common laundry detergent
The excitation and emission spectra of the powder show optical brighteners absorbing in the region between 320 and 390 nm and emitting over the 400–500 nm range. Fabrics washed in this detergent would exhibit a blue hue.

Fluorescence measurement of stalactites

Use the Cary Eclipse fluorescence spectrophotometer with fibre optic coupler and probe to measure the fluorescence of demanding solid samples such as stalactites.

- Measure oddly shaped samples such as stalactites and live corals using an optical light guide.
- Fiber optic probe and coupler are easy to install and align and require no sample preparation.
- Easily acquire fluorescence spectra — simply place the solids tip on the surface of the sample without any need for light shielding.



Investigating the fluorescent properties of a cross-sectioned stalactite
The probe tip was simply positioned on the stalactite surface to collect the excitation emission matrices (EEMs). The system can also be used for gemstone fingerprinting and impurity detection, and for soil, mineral and ore analysis.

reliable

LIFE SCIENCE APPLICATIONS

In a field that demands accuracy and productivity, your challenges have never been greater. Today, analysis must be done more reliably, more efficiently, and with even higher quality results than ever before. Agilent provides unrivalled optical performance and superior temperature control to measure the most challenging of samples with the highest accuracy.

Protect precious samples

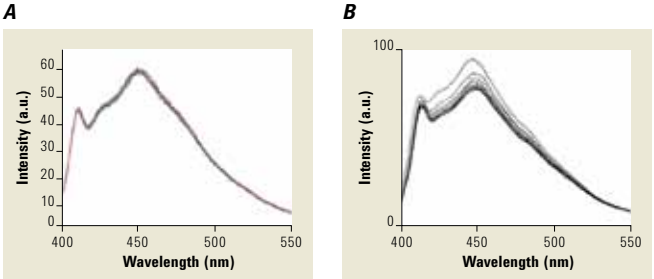
- Photosensitive samples are not exposed to continuous light as the lamp flashes only to acquire a data point, preventing photodegradation
- Micro cuvettes enable highly accurate measurements of precious biological samples
- Sample compartment temperature is stable, as the lamp does not produce heat, ensuring accurate and reproducible data

Rapid and precise kinetics measurements

- Collect steady-state fluorescence data at 80 points per second, and pause data collection at any time to add reagents without affecting performance
- Extend collection times during a run
- Perform time-resolved phospherence and delayed fluorescence lifetime measurements
- Use the rapid mix accessory to analyze reactions that are over in less than 1–2 seconds

Intracellular ion concentrations

- Use the fast filter accessory or the fast slew rate of the monochromators to collect data for intracellular ion concentration analysis or pH measurements in real time — 50 ms – 1 sec for ratiometric measurements or every 12.5 ms for single wavelength dyes



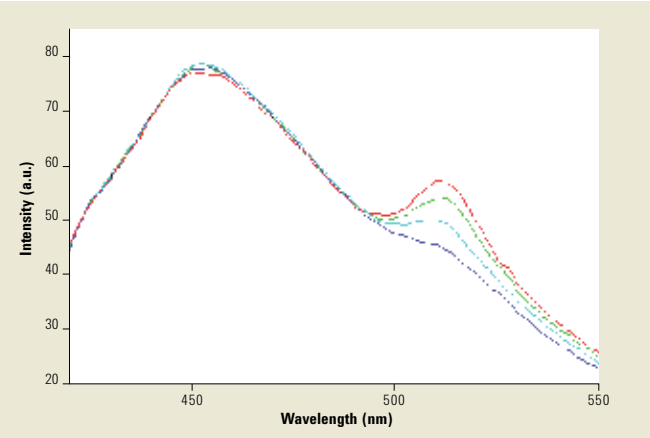
No photobleaching

Emission wavelength vs intensity for BFP following 370 nm excitation. A negligible drop in peak BFP emission (450 nm) was recorded after 10 successive scans at a scan rate of 120 nm/min (total exposure time 12 min 30 s) using the Agilent Cary Eclipse (a), whereas photobleaching of approximately 20% was observed using a commercially available instrument fitted with a traditional xenon arc lamp (b).

Automated polarizer
Simplify measurements by using the automated polarizer and WinFLR software to automatically measure changes in polarization over time.

Rotational motion of molecules

- Optional UV transmitting film polarizers enable excitation down to 275 nm, ensuring that even tryptophan can be excited without photobleaching.
- Polarizers allow measurements to be obtained at the significant angle of 55˚ as well as the complimentary angle of 35˚.
- With an extremely low extinction ratio in the cross-position, rotational motion of proteins and solvent interactions can be measured with high precision and accuracy.
- Sturdy design ensures the polarizers are easy to clean and maintain.



Monitor cell function of photosensitive samples at the protein level
Emission spectra of the blue fluorescent protein (BFP)- green fluorescent protein (GFP) fusion protein following 360 nm excitation are shown. GFP emission (~510 nm) is seen upon specific excitation of BFP alone (360 nm), indicative of FRET.

Excellent temperature control

The Cary Eclipse temperature controlled peliter thermostatted cell holder offers:

- Simultaneous measurement of up to four samples.
- Rapid and precise temperature control essential for controlling the intensity of fluorescence emission.
- Excellent stability control over time (typical variation ±0.05 °C).
- Minimal cell-to-cell variation (maximum difference, 0.2 °C at 37 °C).
- Accurately measure the temperature of the actual sample within the cuvette using temperature probes.
- In-built electromagnetic stirring providing complete control of the stirring speed, with no fluctuations (up to 4 cells).
- Temperature ramp rates as slow as 0.06 °C/min can be selected for thermal denaturation and renaturation studies of DNA via fluorescence resonance energy transfer (FRET).

Trust Agilent to keep your lab running at peak productivity

Agilent's Advantage Service protects your investment in Agilent instruments and connects you with our global network of experienced professionals who can help you get the highest performance from every system in your lab. Count on us for the services you need at every stage of your instrument's lifecycle – from installation and upgrade to operation, maintenance and repair.

For customers who require full system validation, Agilent offers complete qualification services (Installation and Operational Qualification) for the Cary Eclipse hardware, software and accessories.

And if ever your Agilent instrument requires service while covered by an Agilent service agreement, we guarantee repair or we will replace your instrument for free. No other manufacturer or service provider offers this level of commitment.

Further information

For full details of the Agilent Cary range of molecular spectroscopy products, ask for a brochure or visit our web site at www.agilent.com/chem/

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