# Phosphorescence Spectrophotometer Cutter

Article Overview

A phosphorescence spectrophotometer cutter is a shutter or mechanism that blocks the excitation light to isolate and measure phosphorescence signals.

Function and Principle

Phosphorescence occurs when electrons in a molecule undergo intersystem crossing to a triplet state and relax slowly to the ground state, emitting light over a longer timescale than fluorescence . During excitation, both fluorescence and phosphorescence are emitted, but fluorescence decays within nanoseconds, while phosphorescence persists for microseconds to seconds . To measure phosphorescence accurately, the excitation light must be cut off, allowing only the delayed phosphorescence to be detected. This is achieved using a shutter or cutter in the spectrophotometer, typically positioned at the excitation monochromator .

Instrumentation

Modern spectrofluorometers and phosphorescence lifetime spectrometers incorporate this feature:

o Shutter Mechanism: Opens to allow excitation and closes to block it, enabling measurement of phosphorescence without interference from fluorescence .
o Excitation and Emission Monochromators: Select specific wavelengths for excitation and emission, ensuring precise measurement of phosphorescence signals .
o Detectors: Positioned at 90? to the excitation source to avoid direct light interference, capturing only emitted phosphorescence . Some advanced instruments, like the FluoroMax Plus or Agilent Cary Eclipse, offer software-controlled shutters and pulsed light sources to facilitate time-resolved phosphorescence measurements, including Time-Correlated Single Photon Counting (TCSPC) for lifetimes as short as picoseconds .

Practical Considerations

When using a phosphorescence spectrophotometer cutter:

o Ensure the shutter timing matches the phosphorescence lifetime of the sample.
o Consider the wavelength range and sensitivity of the detector.
o Use appropriate filters or gratings to isolate the emission signal from background light . This mechanism is essential for distinguishing phosphorescence from fluorescence and obtaining accurate lifetime and intensity measurements in chemical, biological, or environmental samples.

# Phosphorescence Spectrophotometer Cutter

luoroMax Series The FluoroMax® series represents HORIBA"s industry-leading spectrofluorometer performance in a convenient,

Now that PL and phosphorescence are correctly scaled, the low-temperature fluorescence spectrum can be obtained

A fluorescence spectrophotometer, often known as fluorimetry or spectrofluorometry, is a sophisticated branch of

Phosphorescence spectroscopy is defined as a quantitative analytical technique that measures the phosphorescent emission of

There are two types of luminescence: fluorescence and phosphorescence. Phosphorescence occurs when excited

Light emission as a result of photo-excitation can occur partially in the form of fluorescence and partially as

Discover our modular photoluminescence spectrometer for ultimate sensitivity and versatility in steady-state and time-resolved

Atoms have quantized energy levels too, and can absorb and emit photons of energy equal to the difference in energy between two

Applications of F-7000 in four field: Industrial Material Field, Pharmaceutical Field, Biological Field and Environmental Field.

Fluorescence, a type of luminescence, occurs in gas, liquid or solid chemical systems. Fluorescence is brought about by absorption

Solid sample holding stick used with the PMU-130 for solid phosphorescence measurements.

Fluorescence spectroscopy is used for studying structural changes in conjugated systems, aromatic molecules, and rigid, planar

There are four distinct models in the FP-8000 Series, each offers an optimized solution for fluorescence and phosphorescence

The unique demands of fluorescence and phosphorescence, however, require some modifications to the

instrument designs seen

Fluorescence and phosphorescence phenomena overlap in fluorescence spectra generated with a fluorescence spectrophotometer

The Cary Eclipse fluorescence spectrometer is a sensitive, accurate, and flexible fluorometer with unique

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