Time-Correlated Single Photon Counting Fluorescence Lifetime Measurements

Time-Correlated Single Photon Counting (TCSPC) technique is used to measure the fluorescence lifetime of compounds in specific environments. An ultra-fast laser pulse excites the sample and the light emitted from the sample is tagged for arrival time. A decay trace of the fluorescence as a function of time is used to determine the number of lifetime components present and their respective value. Lifetime measurements from 50 picoseconds to hundreds of nanoseconds can be measured.

Specifications

Excitation wavelength	240 to 330 nm 360 to 500 nm 9.5 kHz to 4.75 MHz (variable) or 76 MHz
Emission wavelength	400 – 910 nm (monochromator + MCP-PMT)
Time range	3.3 ns to 2µs up to 4096 time channels
Cuvette	Temperature control and magnetic stirring (FLASH 200, Quantum Northwest): -25 to +80 °C
Objective lens	63x/0.9NA, 2.2 mm working distance
Detection	MCP-PMT, R3809U-51 (Hamamatsu) FWHM 35 ps 160 to 190 nm
Acquisition	Data acquisition board: SPC-830 (Becker and Hickl) SPC 630 (Becker and Hickl)
Advanced capabilities	Detection below 400 nm (optical filter for wavelength selection) Detector: PMC-100-4 (Becker and Hickl) detector (185-820 nm and FWHM ~ 190 ps) Detection in ultra-violet and visible with CM110 monochromator (gratings AG1800-00450H or AG0600-00500) and PMC-100-4 detector Dual detectors: MCP-PMT and PMC-100-4 with CM110 (individual data acquisition boards)

Settings

Pulse repetition rate and width are adjusted to prevent sample bleaching.
Sample temperature control is available.
This system uses the Verdi / Mira / Pulse Picker / Harmonic Generator suite.