Spectrofluorometer with Time Correlated Single Photon Counting (TCSPC)

- Fluorescence spectroscopy analyzes fluorescence from a molecule based on its fluorescent properties. Fluorescence is a type of luminescence caused by photons exciting a molecule, raising it to an electronic excited state.
- In simple terms, fluorescence lifetime of a molecule is the average length of time it spends



in the excited state. This depends on the type of molecule and its local environment. Typically, the excited state decays in an exponential manner, as indicated in the equation below.

$$I(t) = I0 \exp(-t/\tau)$$

τ is the fluorescence lifetime or the time for the intensity to decay to 1/e of its initial value.

- The use of fluorescence lifetime has its advantages over that of an intensity measurement, as it is an "absolute" measurement, rather than the "relative" steady state measurement (which gives a time-averaged signal).

Features

- ✓ Water Raman signal-to-noise ratio: 10,000:1 (FSD method)
- ✓ Photon Counting for Ultimate Sensitivity
- ✓ Fast Scanning capability - up to 80 nm/second
- ✓ Phosphorimeter accessory for long-lived luminescence determinations
- ✓ Time-correlated single-photon counting (TCSPC) accessory for lifetime determinations
- ✓ Measure lifetimes from 25ps with laser diodes and PPD detection module
- ✓ Up to 1,000 TCSPC measurements per second – ideal for kinetics studies
- ✓ Monochromator wavelength selection

Measurement modes

- Lifetime – measure 25ps to 1s
- Kinetic TCSPC – 1 to 10 000 decays measured sequentially in 1ms to 1min per decay
- Anisotropy – deconvolution analysis to resolve shorter rotational correlation times
- Time-resolved emission Spectra (TRES) – Collect up to 100 wavelength-dependent decays
- Steady-State
- Available Nano LEDs: 340nm, 370nm

Sample Requirements

- For Solid Samples: Minimum 2cm X 2cm
- For Liquid Samples: Approx. 10ml
- For Powder Samples: Approx. 50-500mg

Details of Spectrofluorometer with TCSPC

Brand	Horiba, Japan
Model	FluoroMax Plus
Sponsored Agency	DST- PURSE program (Phase -2)