



INDIAN INSTITUTE OF TECHNOLOGY BOMBAY

MATERIALS MANAGEMENT DIVISION

Powai, Mumbai - 400076

Technical Specifications of Spectrofluorometer
RFx No. 6100001339 (Reference No. 1000031061)

In general, the system is a bench top system for measuring fluorescence steady state spectra using the method of single photon counting. The system has a standard Signal to Noise Ratio of >10,000:1 for the standard water Raman scan.

I. Optical System

- a) All reflective
- b) Czerny Turner excitation and emission monochromators
- c) Bandpass from 0 to 30 nm, continuously adjustable via software (resolution limit of 0.3 nm)
- d) Wavelength accuracy ± 0.5 nm
- e) Scan speed ~ 100 nm/s
- f) Sensitivity > 10,000:1 (SQRT Method)
- g) Fibre optics cable with adequate fittings for external sample, preferably a coupler for the existing close cycle cryostat (drawings can be provided upon request)

II. Light Source

- a) 150 W xenon lamp with Excitation Monochromator

Mechanical wavelength coverage: 200 nm-1000 nm

1200m grating optimised for 300 nm

Automatic filter wheel for second order removal

- b) 300 mW 532 nm Laser for CW Operation with adequate mounting system

532 nm CW laser with 300 mW output power with $\sim 3\%$ stability. Wavelength of laser is 532 \pm 1 nm and the system should be provided with a controller with a power control knob and TTL input.

III. Detectors, Electronics and Data Acquisition

- a) Reference Detector: Calibrated silicon reference detector

- b) Transmission Detector: Detector for transmission/absorption measurements

IV. Emission Monochromator

- a) Mechanical wavelength coverage: 200 nm-1000 nm
- b) 1200 g/mm grating optimised for 500 nm
- c) Automatic filter wheel for second order removal

V. Emission Detector

- a) Single photon counting photomultiplier in temperature stabilised housing
- b) Spectral range: ~ 400 nm -1000 nm

VI. Data Acquisition Electronics

- a. Three parallel counter modules for fluorescence, reference and transmission detectorSoftware
- b. Control over spectrometer components such as lamps, monochromator and detector settings
- c. Spectral and kinetic data acquisition
- d. Batch measurements for automated sequential operations; spectral and lifetime available depending on light sources and electronics
- e. Automatic or manual spectral correction
- f. Data handling routines (normalisation, scaling, arithmetic, integration, differentiation, smooth etc.)
- g. File import/export options, including ASCII

VII. PL and EL Quantum Yield Measurement Accessories

Measurement Module with minimum 150 mm inner diameter integrating sphere for the measurement of fluorescence quantum yields by the absolute method and reflection measurements. Provisions for solutions, film and powder samples measurements. Holders for both direct and indirect excitation should be provided. The integrating sphere should be fully integrated in the instrument's sample compartment as well as the software, including all calculations. Sample holder for electroluminescence (EL) measurements inside the integrating sphere. The sample holder comprises a tray type fitting with electrical contacts (with needed feedthrough) for electroluminescence measurements.

VIII. One laptop for operation and one for the data analysis should be provided.

IX. On-site training should be provided.

X. The system should be installed on sight within 90 days from the date of the PO.

XI. 3 years onsite warranty on set up.
