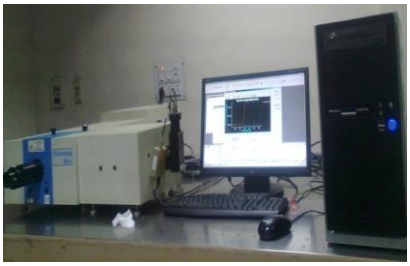
Measurement of: Photoluminescence measurement

Equipment: PL spectrum measurement system (Jobin Yvon – Horiba, Fluorolog Model FL 3-11)

Property Measured: Photoluminescence

Photograph (small size)



Basic Principle:

This instrument is equipped with a steady state and transient excitation source, and a photomultiplier tube. Steady state excitation source was a xenon lamp with broad spectral emission covering entire visible part of electromagnetic spectrum. A monochromator placed before the sample chamber selects the wavelength used to excite the sample. This monochromator is generally a combination of gratings. The excitation wavelength is generally selected from the absorption spectrum of the material being excited and corresponds to the wavelength for maximum absorption intensity. Upon excitation, electrons inside the material move to higher excited state and, their, they relax to the lowest vibrational state. After a certain delay time, electron makes a transition to the ground state by emitting a photon. This delay time is called as the excited state lifetime of material, which is measured using time resolved PL measurements. In time resolved PL measurements, light with small pulse duration (typically few ps) is used to excite the material to its higher excited state and then the PL intensity is detected as a function of time. This intensity decays with time and this decay gives a measure of excited state lifetime.

Capabilities:

It consists of an excitation source, excitation monochromator, sample chamber, emission monochromator and detector.

Steady state excitation source is a xenon lamp

Nano-LED of wavelength 327 nm with 1.2 ns pulse, 405 nm with 1 ps pulse width, 460 nm with 1.2 ns pulse width and 560 nm with 1.3 ns pulse width are used to measure the time resolved PL (TRPL) spectra .

Range: 200nm to 800nm

Sample Requirement: Thin Film (reflecting)/Liquid