

PHOTOLUMINESCENCE MEASUREMENT SETUP

Photoluminescence (PL) spectroscopy, a mandatory characterization method for the materials (like III-V semiconductors) is a contactless, nondestructive but at the same time very effective and useful experiment to investigate electronic structure of materials. If a light particle (photon) has energy greater than the band gap energy, then it can be absorbed and thereby raise an electron from the valence band up to the conduction band across the forbidden energy gap. At this point the electron eventually falls back down to the valence band losing energy as a luminescent photon which is emitted from the material. The process of photon excitation followed by photon emission is called photoluminescence.

The sample is loaded in a cryostat and excited with a focused laser beam of say 532 nm, 25 mW. The emitted light is collected by a collection lens and detected by array detector mounted on a triple grating spectrometer. Power dependent and Temperature dependent Photoluminescence spectra are acquired and analyzed.

- Materials: III-V compounds
- Sample Size: 2 mm minimum to 10mm maximum wafer.
- **No liquid/powder volatile compounds allowed.**
- Temperature range: ~19K to 300K
- PL Wavelength Range: 350nm to 950nm and 900nm to 1600nm
- Excitation wavelength: 532 nm upto 25mW
- Spectral resolution: 0.05nm to 0.1nm depending on wavelength

