

**Measurement of:** Reflectance, transmittance or absorbance characteristics of materials

**Equipment:** UV-Vis-NIR Spectrophotometer (LAMBDA 1050, PerkinElmer, USA)

**Property Measured:** Optical characteristics/parameters of materials

**Photograph (small size)**



UV-Vis-NIR Spectrophotometer (LAMBDA 1050, PerkinElmer, USA)

### **Basic Principle:**

Electromagnetic radiation from a source is dispersed and the dispersed light is passed through the sample under study. The interaction of light with matter induces photo-induced electronic transitions between different bands by the absorption or emission of radiation at a characteristic frequency. The radiation after the interaction is studied as a function of incident wavelength with a suitable detecting system. The optical spectrometer consists of three main components of light source with monochromator, sample and reference port and the detecting system. This is a non-destructive method of evaluating optical characteristics of materials.

### **Capabilities:**

The system is capable of measuring reflectance (diffuse/specular), transmittance or absorbance characteristics of a sample using the following modules:

1. 3-Detector Module: Transmittance/absorbance measurements of liquids, solids, and films

Wavelength Range: 175 -3300 nm

2. Diffuse Reflectance Accessory: Diffuse Transmittance/Reflectance of liquids and solids

Wavelength range: 200 - 2500 nm

Angular Range: Reflectance spectra at 10° intervals between 10° and 60°

3. Universal Reflectance Accessory: Analysis of optical reflectance (specular) of samples

Wavelength range: 200 - 2500 nm

Angular range: 8 – 68° incident angles

### **Sample Requirement:**

Sample size should be more than 1 x1 cm<sup>2</sup> irrespective of the measurement type for films and solids; for measurements on liquids sample minimum volume required in 100 microliter.