

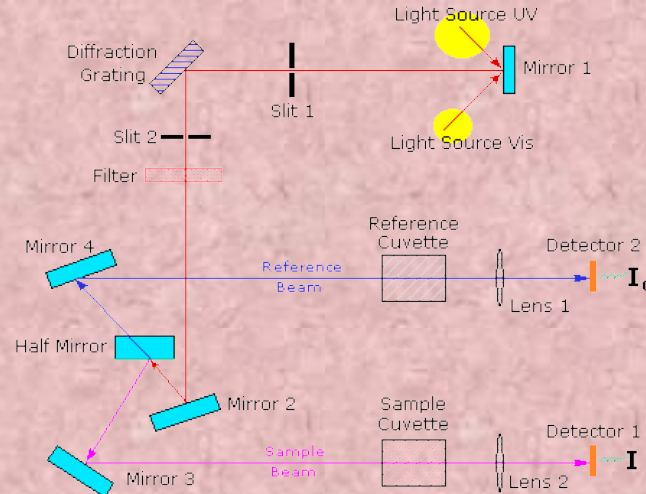
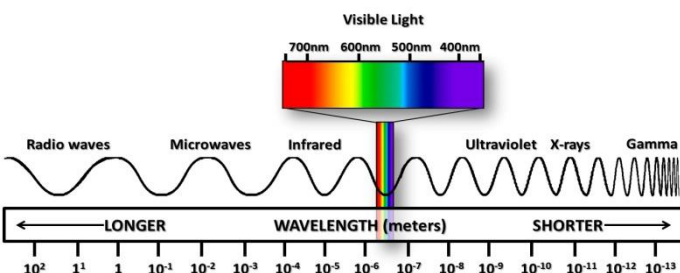
UV/Vis/ NIR Spectroscopy

Equipment Model : LAMBDA 750

Company Name : Perkin Elmer

Operating Range : 190-3300 nm

Source of light : Tungsten-Halogen & Deuterium



Working Principle of Spectroscopy

➤ The principle is based on the measurement of spectrum of a sample containing atoms / molecules.

➤ Spectrum is a graph of intensity of absorbed or emitted radiation by sample versus frequency (ν) or wavelength (λ).

➤ Spectrometer is an instrument design to measure the spectrum of a compound.

1. Absorption Spectroscopy:

➤ An analytical technique which concerns with the measurement of absorption of electromagnetic radiation.

➤ e.g. UV (185 - 400 nm) / Visible (400 - 800 nm) Spectroscopy, IR Spectroscopy (0.76 - 15 μ m).

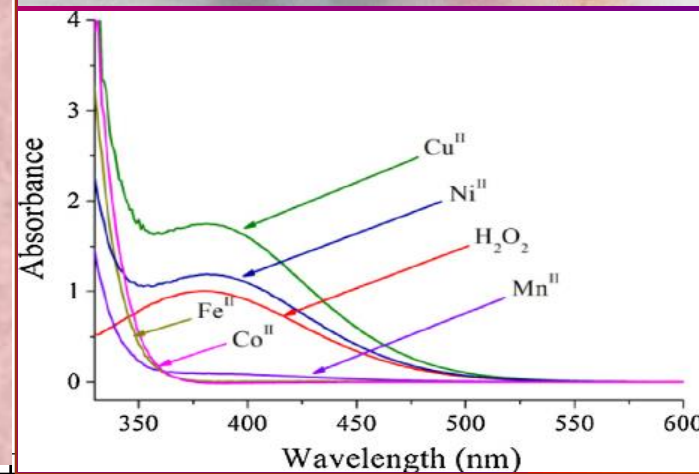
2. Emission Spectroscopy:

➤ An analytical technique in which emission (of a particle or radiation) is dispersed according to some property of the emission & the amount of dispersion is measured.

➤ e.g. Mass Spectroscopy

Applications of UV/Vis/NIR Spectroscopy

- Identification of various organic, inorganic molecules and ions by matching their spectrum with reference spectra.
- For qualitative and quantitative analysis of drugs in pharmaceutical industry.
- Monitoring of reaction rates (chemical kinetics)
- Enzyme assays
- Environmental remote sensing
- Used as detectors in various systems like HPLC, electrophoresis etc.



Introduction

➤ The UV-Vis spectrometry is one of the oldest instrumentals techniques of analysis and is the basis for a number of ideal methods for the determination of micro and semi-micro quantities of analytes in a sample.

➤ UV-Vis spectrum results from the interaction of electromagnetic radiation in the UV-Vis region with molecules, ions, or complexes. It form the basis of analysis of different substances such as inorganic, organic and biochemicals.

➤ These determinations find applications in research, industry, clinical laboratories and in the chemical analysis of environmental samples.

Use of UV-Vis Spectroscopy in Different Fields

UV-Vis Spectrometry is commonly used in different fields such as:

- Research
- Industry
- Clinical Laboratories
- Chemical Analysis of Environment
- Pharmaceutical
- Agriculture (analysis of food coloring)

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