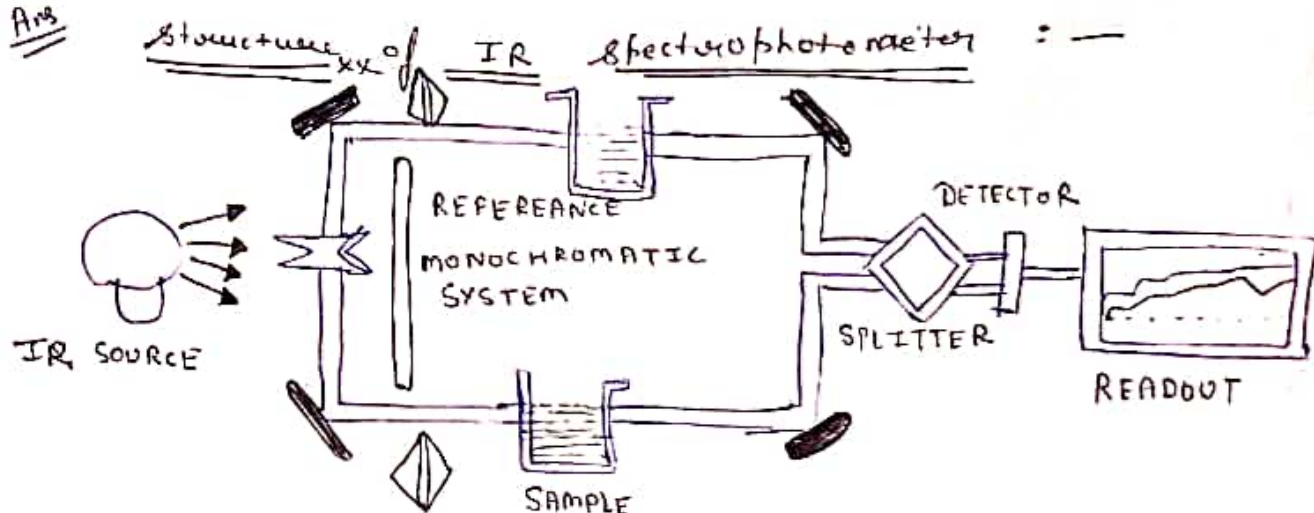


Section - [B]

Ques [27]

Name the various part of IR Spectrophotometer.
Discuss detectors in detail?

Ans



Infrared Spectroscopy (IR Spectroscopy is the vibrational Spectroscopy) is the measurement of the interaction of Infrared radiation with matter by absorption, emission, or reflection. It is used to study and identify chemical substances or functional groups in solid, liquid or gaseous forms. The method or technique of Infrared Spectroscopy is conducted with an infrared spectrometer (or spectrophotometer) which produces an infrared spectrum.

An IR spectrum can be visualized in a graph of infrared light absorbance (or transmittance) on the vertical axis vs. frequency or the wavelength on the horizontal axis.

Infrared detector :- An Infrared detector is a detector that reacts to Infrared (IR) radiation. The two main types of detectors are thermal and photonic (photodetectors). The thermal effects of the incident IR radiation can be followed through many temperature-dependent phenomena. Bolometers and microbolometers are based on changes in resistance. Thermocouples and thermopiles use the thermoelectric effect. Galay cells follow thermal expansion. In IR Spectrometers that pyroelectric detectors are the most widespread. The response time and sensitivity of photonic detectors can be much higher, but usually they have to be cooled to cut thermal noise. The materials in these are semiconductors with narrow band gaps.

Incident IR photons can cause electronic excitations.
An IR Spectrometer consists of 3 basic components
Radiation, source, monochromator, and detector.
The common radiation source for the IR Spectrometer
is an inert solid heated electrically to $[1000 \text{ to } 1800^\circ\text{C}]$

Infrared detector Uses :-

- Widely used in both organic and inorganic chemistry in research and industry.
- Used in quality control.
- It can be used in determining the blood alcohol content of a suspected drunk driver.