How to use IR spectroscopy chart?

Infrared (IR) spectroscopy is a technique used to identify and characterize chemical compounds by analyzing the absorption of infrared radiation by the sample. An IR spectroscopy chart is a graphical representation of the absorption of infrared radiation by a compound, plotted as the intensity of the absorption versus the wavelength of the radiation.

To use an IR spectroscopy chart, you will need to obtain an IR spectrum of your sample using an IR spectrometer. The IR spectrum will show the absorption of infrared radiation by the sample at different wavelengths. To identify the functional groups present in the sample, you can compare the IR spectrum to an IR chart or library of known spectra.

To use an IR chart, you can match the absorption peaks in the IR spectrum of your sample to the absorption peaks on the chart. The functional groups that correspond to these peaks can then be identified based on their characteristic absorption frequencies.

IR Absorptions of Common Functional Groups

Functional Group	*Absorption Location (cm^{-1})*	*Absorption Intensity*
Alkane (C–H)	2,850–2,975	Medium to strong
Alcohol (O–H)	3,400–3,700	Strong, broad
Alkene (C=C) (C=C–H)	1,640–1,680 3,020–3,100	Weak to medium Medium
Alkyne (C≡C) (C≡C–H)	 2,100–2,250 3,300	 Medium Strong
Nitrile (C≡N)	2,200–2,250	Medium
Aromatics	1,650–2,000	Weak
Amines (N–H)	3,300–3,350	Medium
Carbonyls (C=O) Aldehyde (CHO) Ketone (RCOR) Ester (RCOOR) Acid (RCOOH)	 1,720–1,740 1,715 1,735–1,750 1,700–1,725	Strong

It is important to note that IR spectra can be complex, and the interpretation of an IR chart requires a good understanding of the different functional groups and their characteristic absorption frequencies. It may also be necessary to use additional techniques, such as mass spectrometry or nuclear magnetic resonance (NMR) spectroscopy, to confirm the identity of the functional groups in the sample.