



Department of Chemistry
and Biochemistry

The Michael Faraday
Laboratories, NIU
DeKalb, IL 60115-2862
(815) 753-1131

[Chemistry Analytical Lab](#) [FT-IR Spectroscopy](#) IR Absorption Frequencies

Typical IR Absorption Frequencies For Common Functional Groups

Bond	Functional Group	Frequency in cm^{-1} (Intensity*)	
C-H	Alkane	3000-2850 (s)	
	-CH ₃	1450 and 1375 (m)	
	-CH ₂ -	1465 (m)	
	Alkene	3100-3000 (m), 1000-650 (s)	
	Aromatic	3100-3050 (s), 900-690 (s)	
	Alkyne (terminal)	3300 (s)	
C=C	Aldehyde	2850 and 2750 (w)	
	Alkene	1630 (w-m)	
	Aromatic	1600-1475 (w-m)	
	C-C	Alkyne	2150-2100 (w-m)
		C=O	Aldehyde
	Ketone		1725-1705 (s)
Carboxylic Acid	1730-1700 (s)		
Ester	1750-1730 (s)		
Amide	1670-1640 (s)		
Anhydride	1810 and 1760 (s)		
C-O	Acid Chloride	1800 (s)	
	O-H	Alcohol, Ether, Ester, Carboxylic Acid, Anhydride	1300-1000 (s)
		Alcohol, Phenol	
		Free	3650-3600 (m)
		Hydrogen-bonded	3500-3200 (m)
		Carboxylic Acids	3300-2400 (m)
N-H		Primary and Secondary Amine and Amide	3550-3060 (m-s); 1640-1550 (m-s)
	C-N	Amine	1250-1000 (m-s)
Imine and Oxime		1690-1640 (w-s)	
C=N	Nitrile	2260-2240 (m)	
N=O	Nitro (R-NO₂)	1550 and 1350 (s)	
C-Cl	Chloride	800-600 (s)	

s = strong; m = medium; w = weak