

IR Frequencies

Bond Present	Wavenumber cm^{-1}
-OH (Alcohol)	3700 – 3200
-OH (Carboxylic acid)	3600 – 2500 (broad peak)
N-H	3500 – 3100
C-H	3100 – 2800
C=O	1850 – 1600
C=C	1680 – 1600
C-O	1250 - 1050

^{13}C NMR Chemical Shifts

Carbon environment	Chemical Shift (ppm)
C=O (in ketones)	205 - 220
C=O (in aldehydes)	190 - 200
C=O (in acids and esters)	170 - 185
C in aromatic rings	125 - 150
C=C (in alkenes)	115 - 140
RCH_2OH	50 - 65
RCH_2Cl	40 - 45
RCH_2NH_2	37 - 45
R_3CH	25 - 35
$\text{CH}_3\text{CO-}$	20 - 30
R_2CH_2	16 - 25
RCH_3	10 - 15