Typical IR and ^{1}H NMR Values

Bond Type	IR Stretching Frequency (cm^{-1})
C-H	
alkane	2960-2850 (*s*)
alkene	3080-3020 (*m*)
alkyne	3300 (*s*)
aromatic	3100-3000 (*v*)
aldehyde	2900,2700 (*m*)
Triple Bonds	
alkyne	2100-2260 (*v*)
nitrile	2260-2220 (*v*)
Double Bonds	
alkene C=C	1680-1620 (*v*)
aromatic C=C	1600-1450 (*v*)
ester C=O	1750-1735 (*s*)
acid C=O	1725-1700 (*s*)
amide C=O	1690-1650 (*s*)
aldehyde C=O	1740-1720 (*s*)
ketone C=O	
saturated	1725-1705 (*s*)
α,β-unsat'd.	1685-1665 (*s*)
aryl	1700-1680 (*s*)
O-H	
alcohol	
not H-Bonded	3650-3590 (*v*)
H-Bonded	3600-3200 (*s*, broad)
acid	3000-2500 (*s*, broad)
N-H	
amines	3500-3300 (*m*)
amides	3500-3350 (*m*)
C-O	
alcohols, ethers, or esters	1300-1000 (*s*)
C-N	
aliph. amines	1220-1020 (*w*)
arom. amines	1360-1250 (*s*)
NO_2	
nitro group	1560-1515 (*s*), and 1385-1345 (*s*)

Type of H	Chemical Shift δ (ppm)
Methyl	
RCH_3	0.9
$R2C{=}CHCH_3$	1.8
$R(C{=}O)CH_3$	2.1
$ArCH_3$	2.3
$RNHCH_3$	2.5
$ROCH_3$	3.8
$R(C{=}O)OCH_3$	3.8
Methylene	
acyclic CH_2	1.3
cyclic CH_2	1.5
RCH_2X (X=Cl,Br,I)	3.5
$RCH{=}CH_2$	5.0
Methine	
R_3CH	1.8
$RC{\equiv}CH$	2.5
$R_2C{=}CHR$	5.3
Ar-H	7.3
R(C=O)H	9.7
H on Oxygen	
R-OH	1-4
Ar-OH	4-8
R(C=O)OH	10-14
H on Nitrogen	
$R\text{-}NH_2$	1-3
$Ar\text{-}NH_2$	3-5
R(C=O)NHR	5-9

Some Useful IR Bending Frequencies

Bond Type	Frequency (cm^{-1})
C-H alkane	1470-1350 (*s*)
C-H alkene	1000-675 (*s*)
C-H aromatic	870-675 (*v*)
O-H H-Bond/alcohol	1620-1590 (*v*)
O-H carboxylic acids	1655-1510 (*s*)

s = strong; v = variable; m = moderate; w = weak