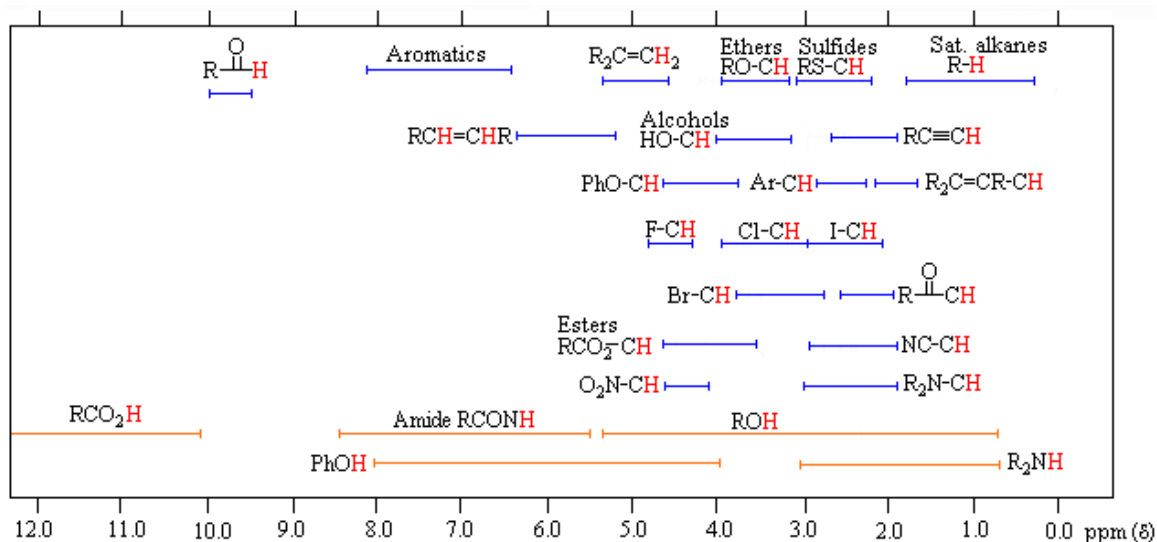
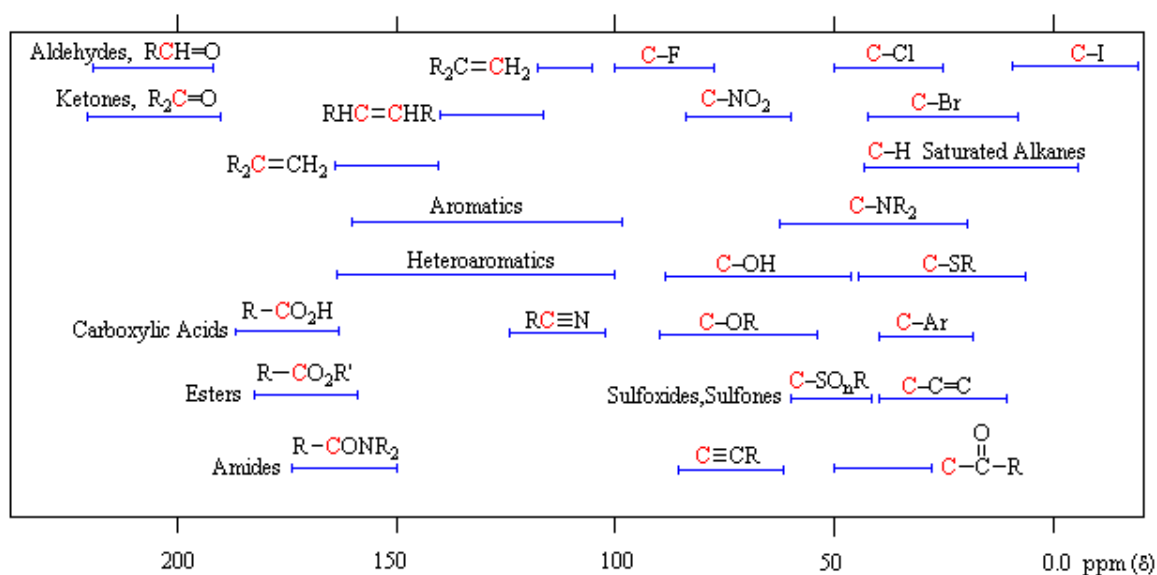


### <sup>1</sup>H NMR chemical shifts



### <sup>13</sup>C NMR chemical shifts



### Infrared Spectroscopy Table

Functional Group	Frequency (cm <sup>-1</sup> )	intensity
water OH Stretch	3700-3100	strong
alcohol OH stretch	3600-3200	strong
carboxylic acid OH stretch	3600-2500	strong
N-H stretch	3500-3350	strong
≡C-H stretch	~3300	strong
=C-H stretch	3100-3000	weak
-C-H stretch	2950-2840	weak

-C-H aldehydic	2900-2800	variable
C≡N stretch	~2250	strong
C≡C stretch	2260-2100	variable
C=O aldehyde	1740-1720	strong
C=O anhydride	1840-1800, 1780-1740	weak, strong
C=O ester	1750-1720	strong
C=O ketone	1745-1715	strong
C=O amide	1700-1500	strong
C=C alkene	1680-1600	weak
C=C aromatic	1600-1400	weak
CH <sub>2</sub> bend	1480-1440	medium
CH <sub>3</sub> bend	1465-1440, 1390-1365	medium
C-O-C stretch	1250-1050 several	strong
C-OH stretch	1200-1020	strong
NO <sub>2</sub> stretch	1600-1500 and 1400-1300	strong
C-F	1400-1000	strong
C-Cl	800-600	strong
C-Br	750-500	strong
C-I	~500	strong