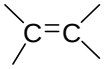
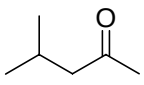
^{13}C NMR

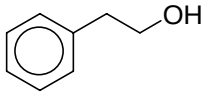
Spectrum provides 2 basic pieces of information:

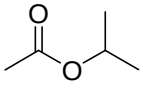
- number of distinct signals = number of different carbons in the molecule (provides information about symmetry)
- chemical shift gives information about electronic environment

Typical ^{13}C chemical shifts

Type of carbon	chemical shift range		
 sp^3C	10-70 ppm	$R\text{-}CH_2Br$ $R\text{-}CH_2NH_2$ $R\text{-}CH_2OH$	28-35 ppm 37-45 ppm 50-65 ppm
—C≡C— spC	65-90 ppm		
 sp^2C	115-140 ppm		
 aromatic	usually 125-150 ppm (but signals can appear significantly outside that range)		
C=O	≥ 170 ppm	ester C=O acid C=O aldehyde C=O ketone C=O	170-175 ppm 177-185 ppm 190-200 ppm 200-220 ppm







# of C's (total):
# of different C's:
# of signals expected:
observed δ: