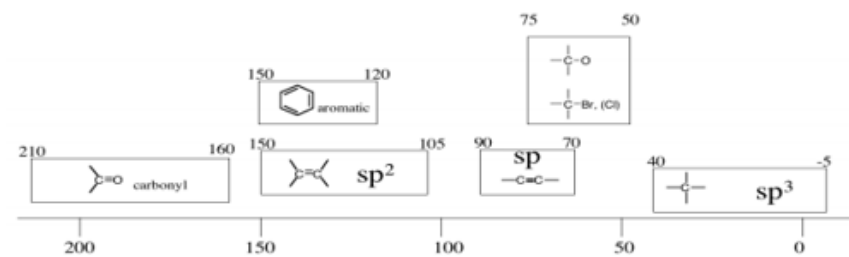


Discussion Section 5

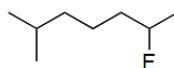
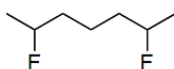
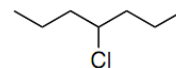
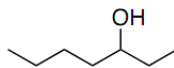
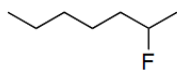
Table for IR Spectra:

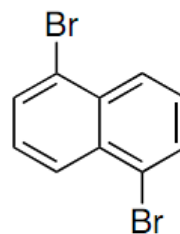
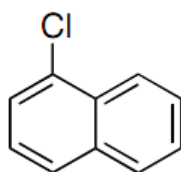
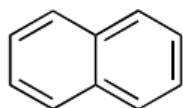
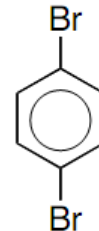
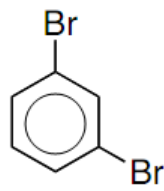
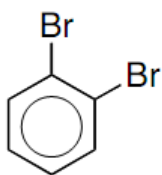
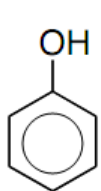
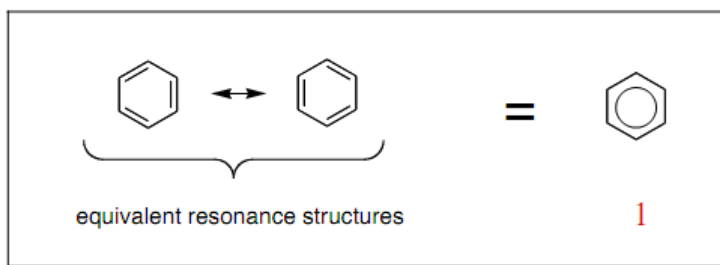
Common Functional Group	IR Wavelength (cm ⁻¹)	Intensity
O-H (alcohol)	3650-3200	strong, broad
O-H (carboxylic acid)	3300-2500	strong, very broad
N-H	3500-3300	medium, broad
C-H	3300-2700	medium
C≡N	2260-2220	medium
C≡C	2260-2100	medium to weak
C=O	1780-1650	strong
C-O	1250-1050	strong

Helpful Table for ¹³C Spectra:

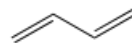


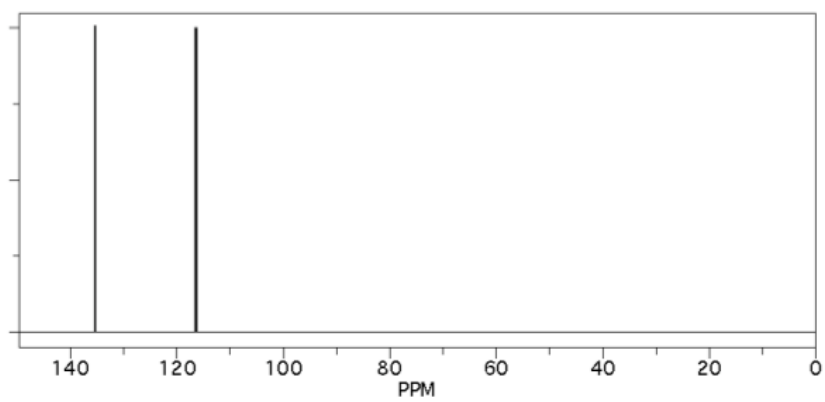
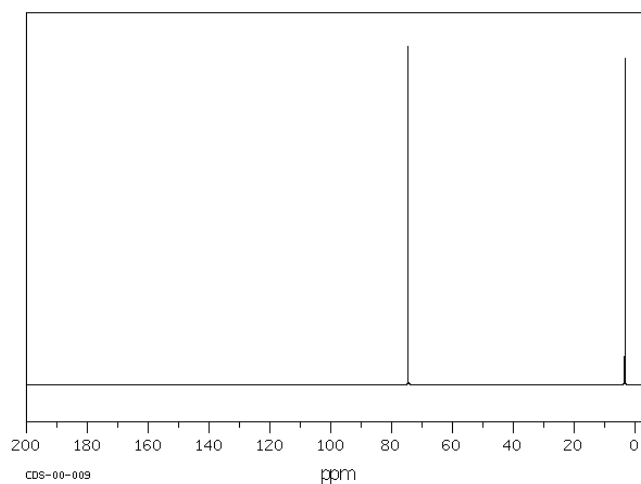
1. How many peaks would you expect to find in the ^{13}C spectra for each of the following molecules?



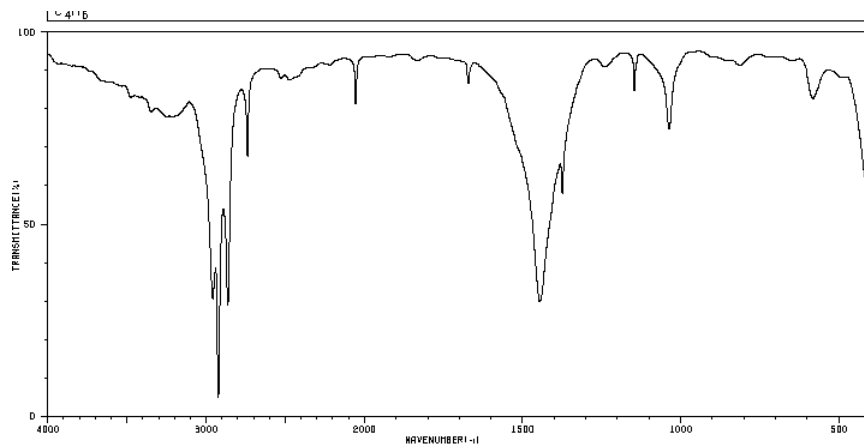


2. Match the structures of the two compounds to the ^{13}C spectra below.



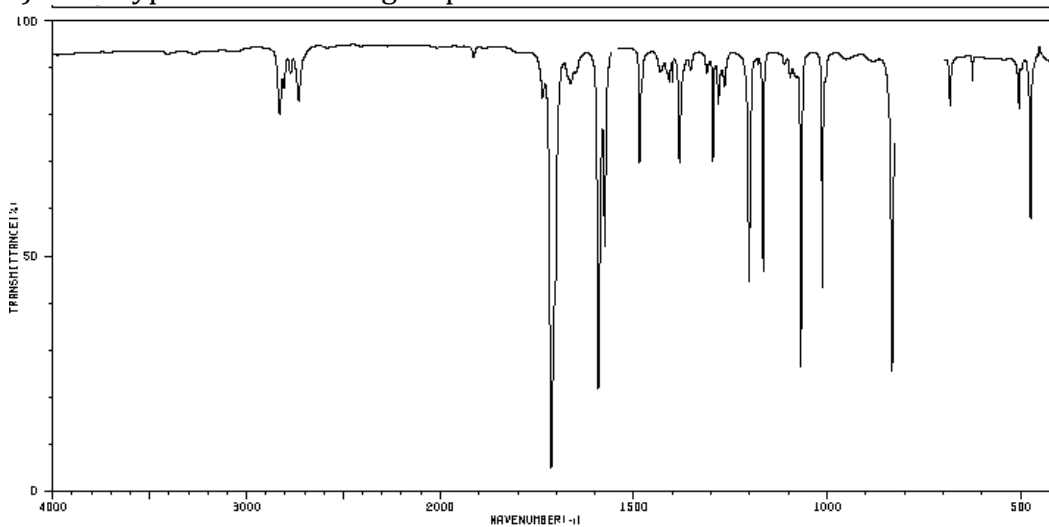


b.) Match one of the compounds from above to the IR spectra below.



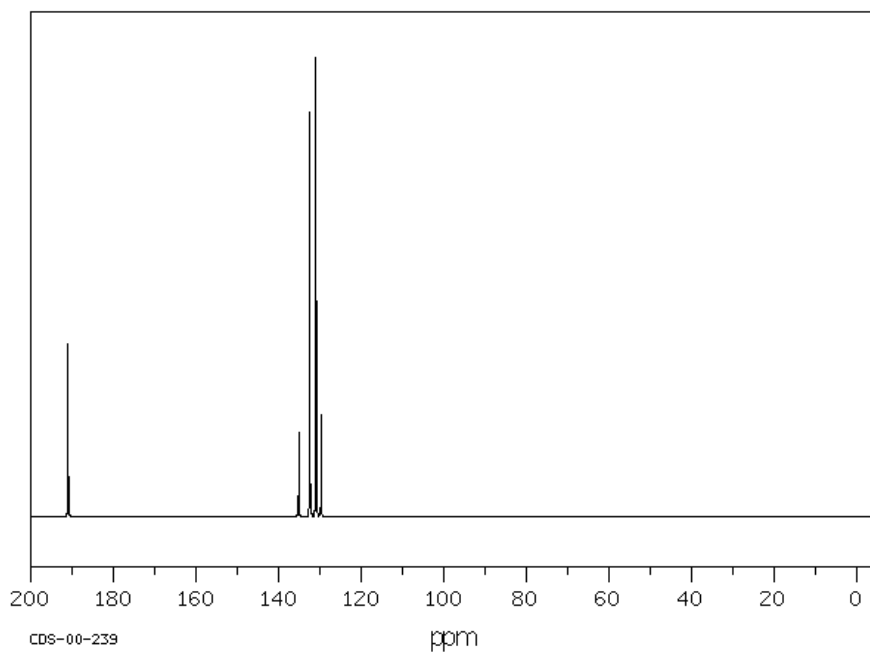
3. a) The molecular formula for a compound is C_7H_5BrO . How many degrees of unsaturation are in the molecule?

b) What types of functional groups are in the molecule based on IR?



c) What are possible structures consistent with the molecular formula and IR data?

d) Based on the following ^{13}C spectrum, which of your proposed structures is the correct one?



4. a) The molecular formula for compound [A] is $\text{C}_6\text{H}_7\text{N}$. How many degrees of unsaturation are in the molecule?

b). Based on the reactivity and ^{13}C NMR spectra of [A], what is the structure of [A]?

[A] + HBr \longrightarrow No Addition Reaction

[A] + $\text{KMnO}_4 \longrightarrow$ No Oxidation Reaction

