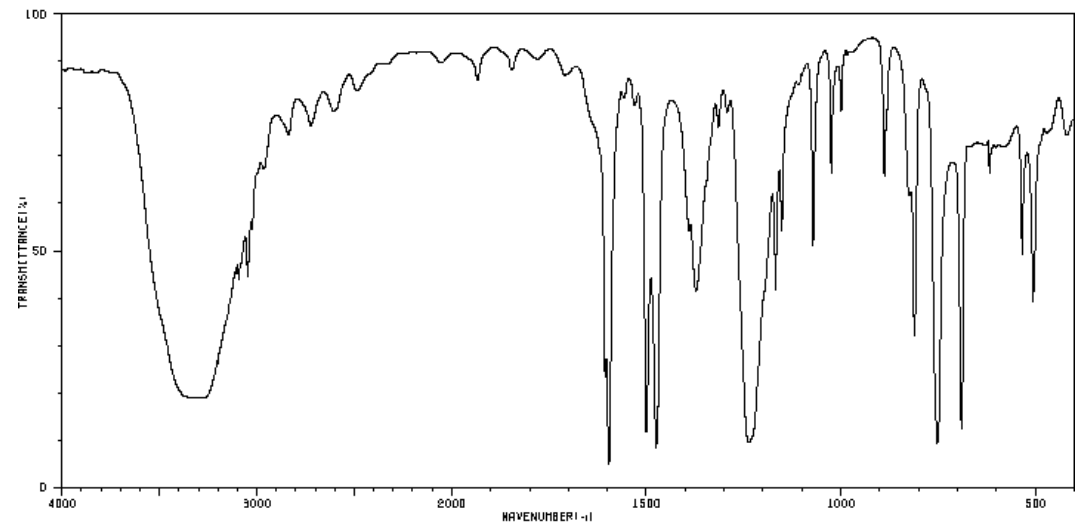
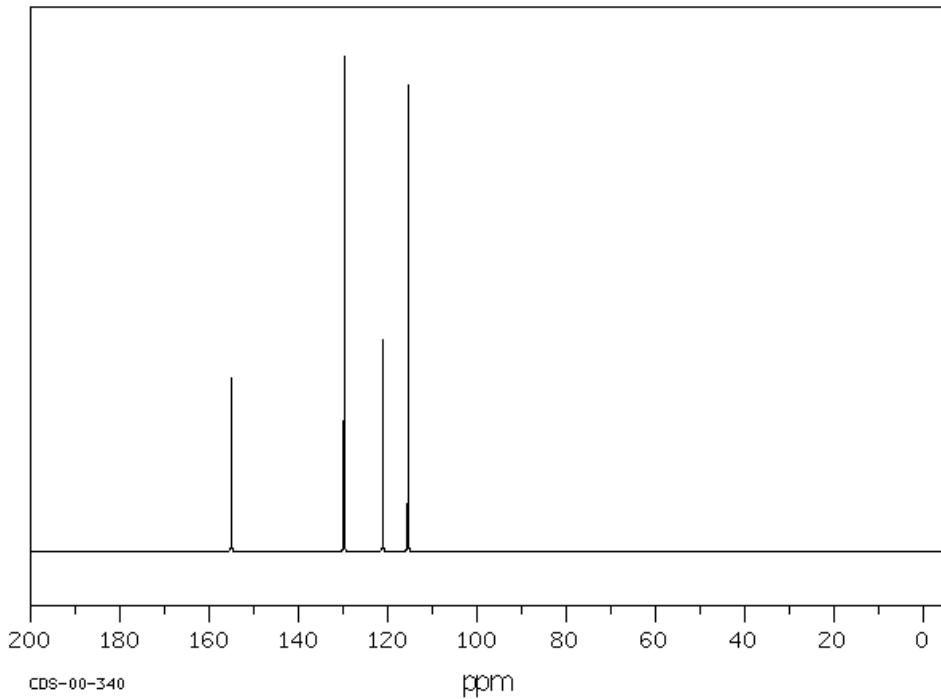


Your name: _____

What am I?



Strategy

1. Try to get a molecular formula.
 - a. more than likely, the molecular weight of our unknown is 94 (M^+ seen on the mass spectrum as $m/z = 94$). If the mass is 95, a nitrogen must be present. Although the IR absorbance for an N-H bond shows in a similar region as does an OH, an OH absorbance is broad while an N-H absorbance is more defined (sharp) - see textbook page 444. If a nitrogen atom was included by mistake, there is no structure that exists that matches the carbon NMR.
 - b. other than C and H, what other atoms are in our molecule?
 - i. M^+ is even, so even number of nitrogens (probably zero)
 - ii. IR shows an OH stretch at 3300 cm^{-1} and no $\text{C}=\text{O}$ near 1700 cm^{-1}
 - iii. Halogens not seen in mass spectrum
 - c. to find molecular formula, assuming only C, H and O
 - i. Subtract one oxygen from 94 ($94 - 16 = 78$) and add C and H into 78.

 $\text{C}_5\text{H}_{18}\text{O}$ - not possible (try working through the degree of unsaturation, and prove it to yourself)
 $\text{C}_6\text{H}_6\text{O}$ - looks like a winner
 C_7O - mass > 94 - can't work
2. Degree of unsaturation = 4
3. If degree of unsaturation is equal to or greater than 4, a benzene ring is likely
4. Carbon NMR shows 4 signals in the $\text{C}=\text{C}$ region - this could be a benzene ring that has an element of symmetry so that it has 4 electronically unique carbons.

