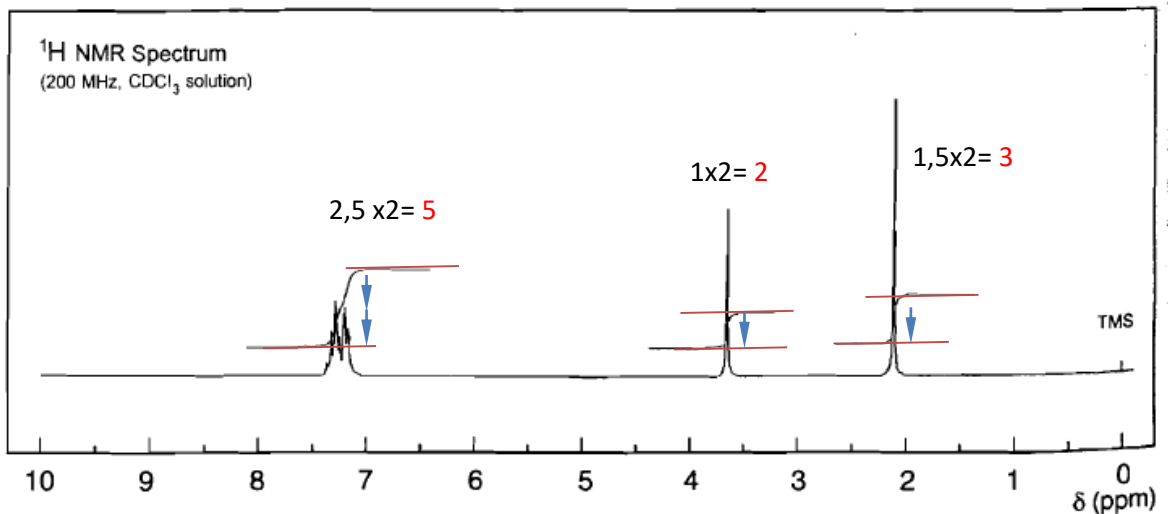
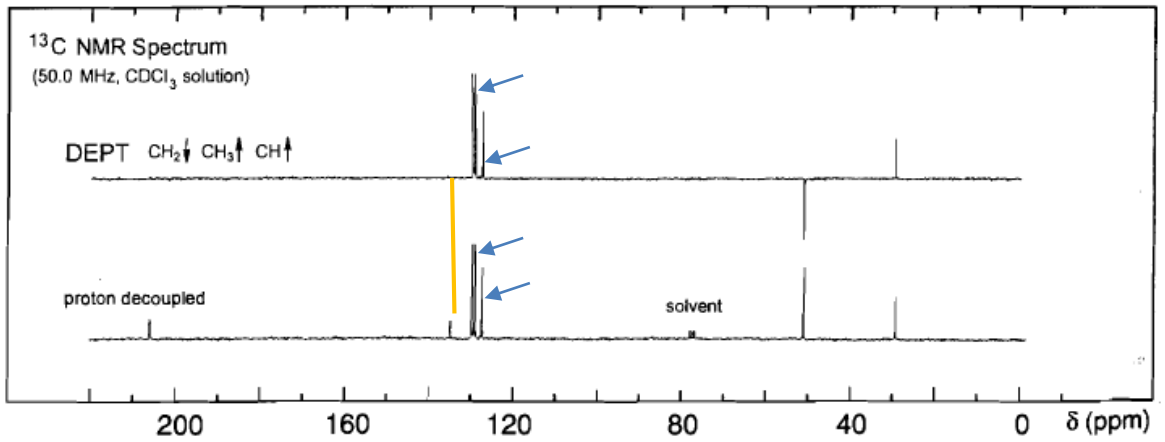
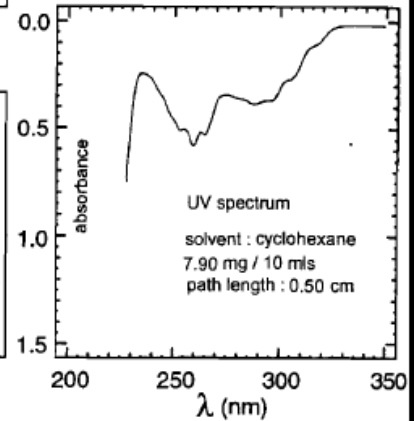
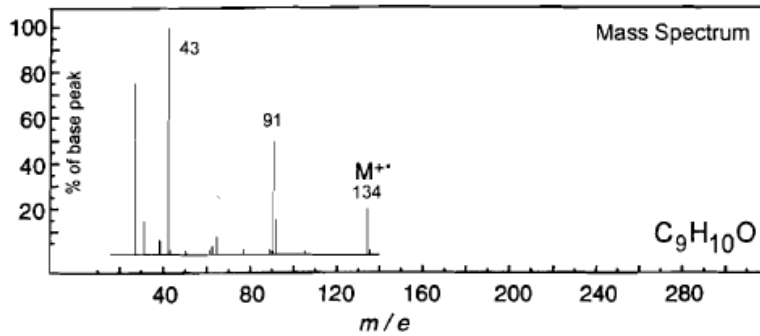
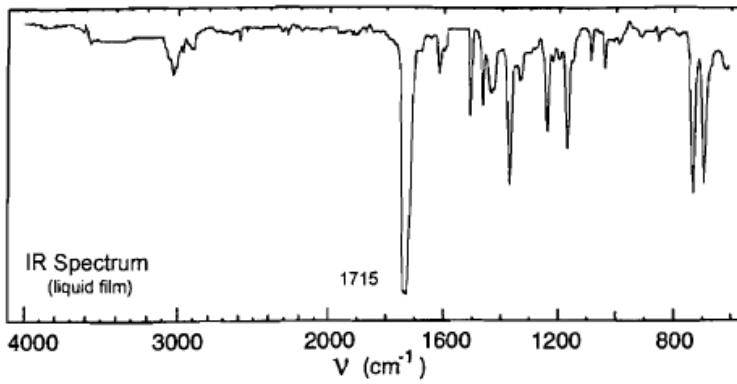
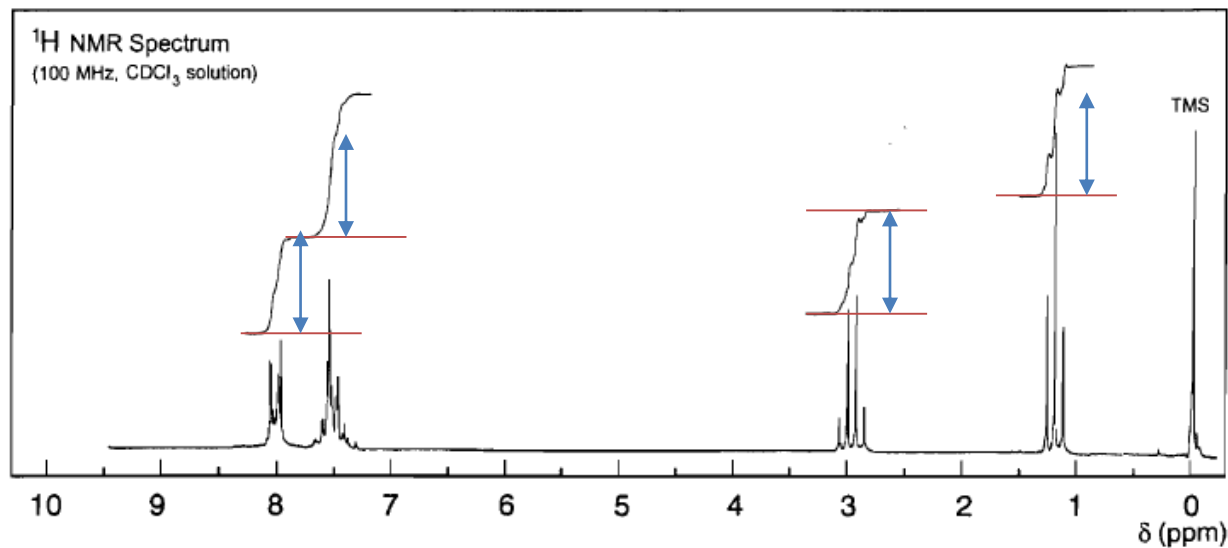
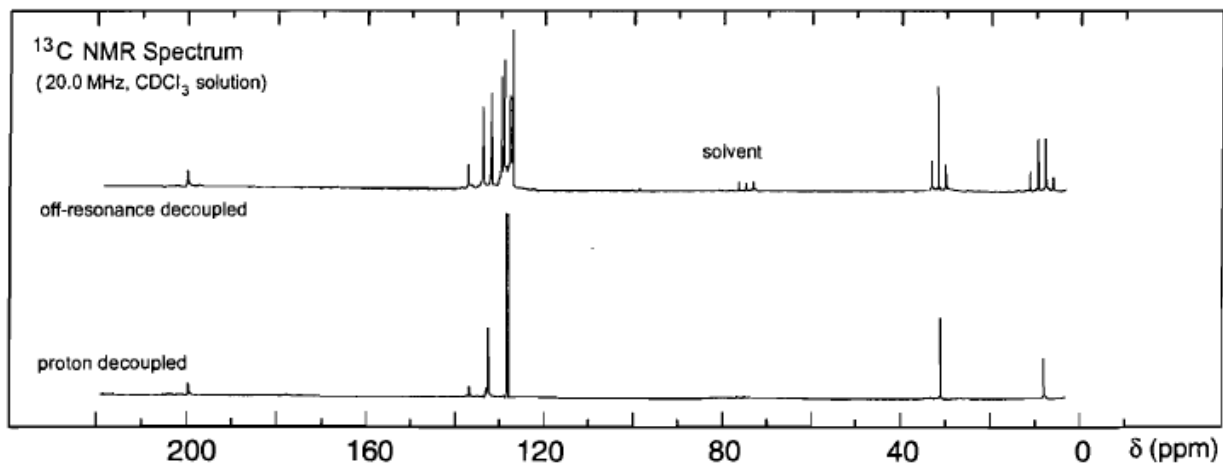
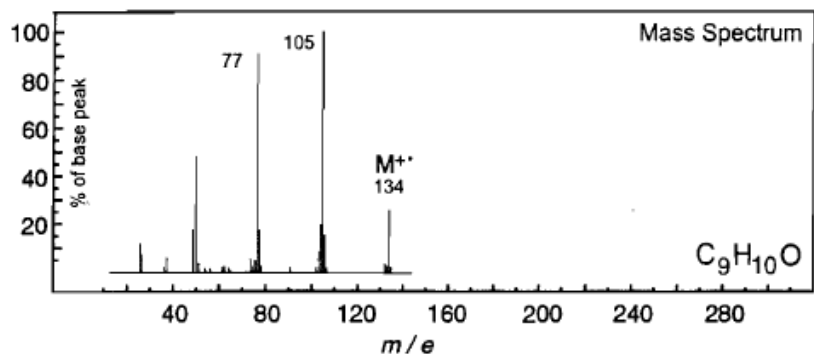
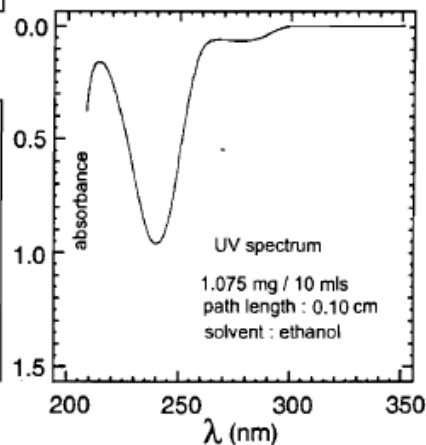
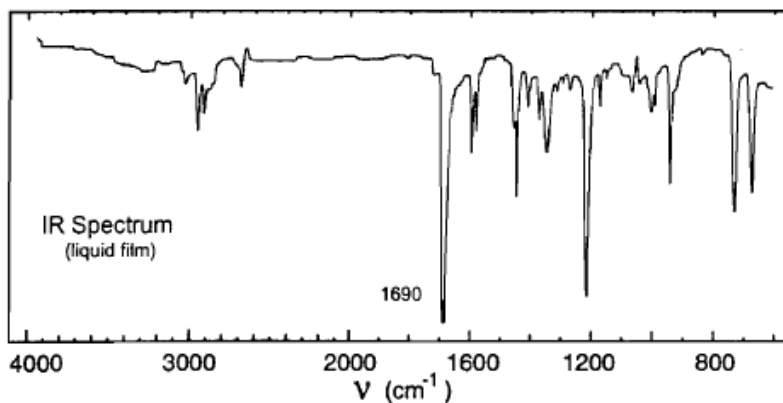


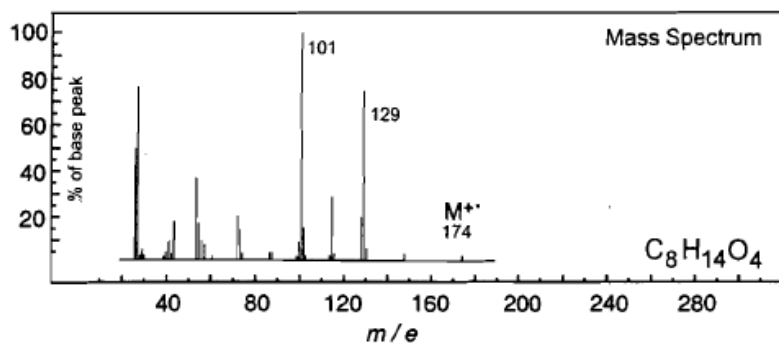
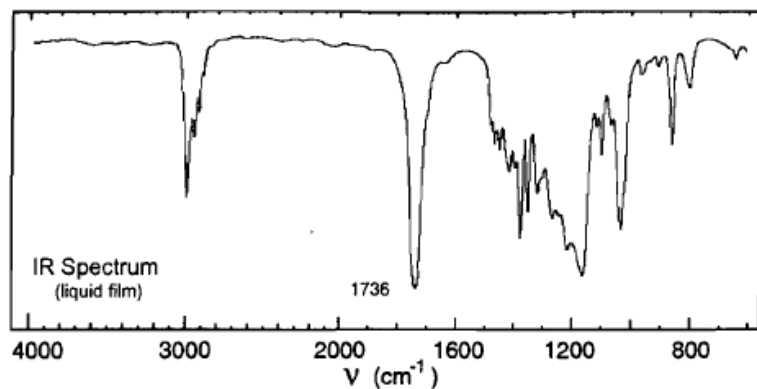
# Problem 29



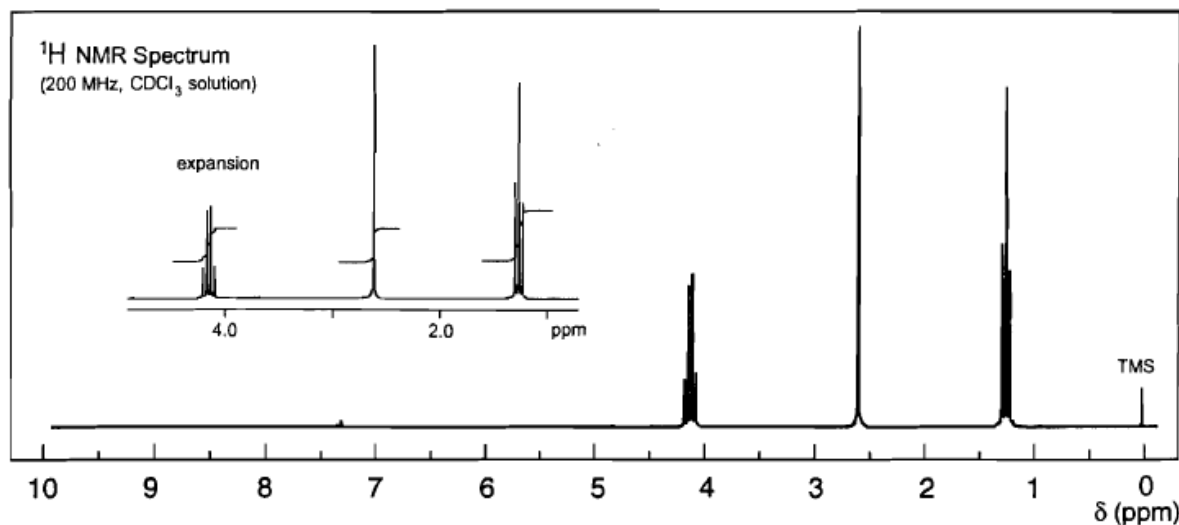
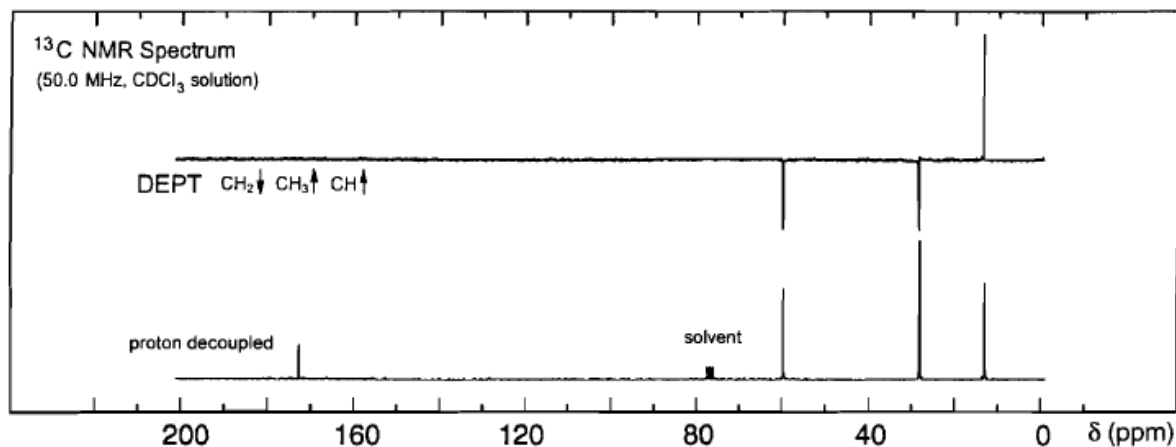
# Problem 30



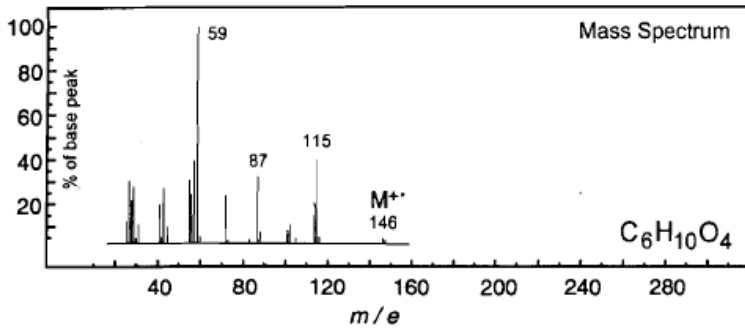
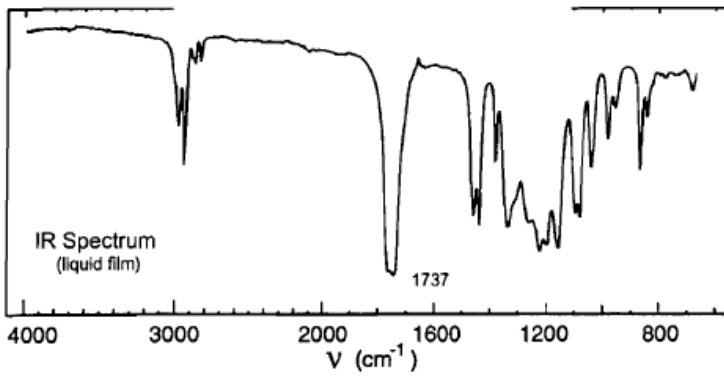
# Problem 48



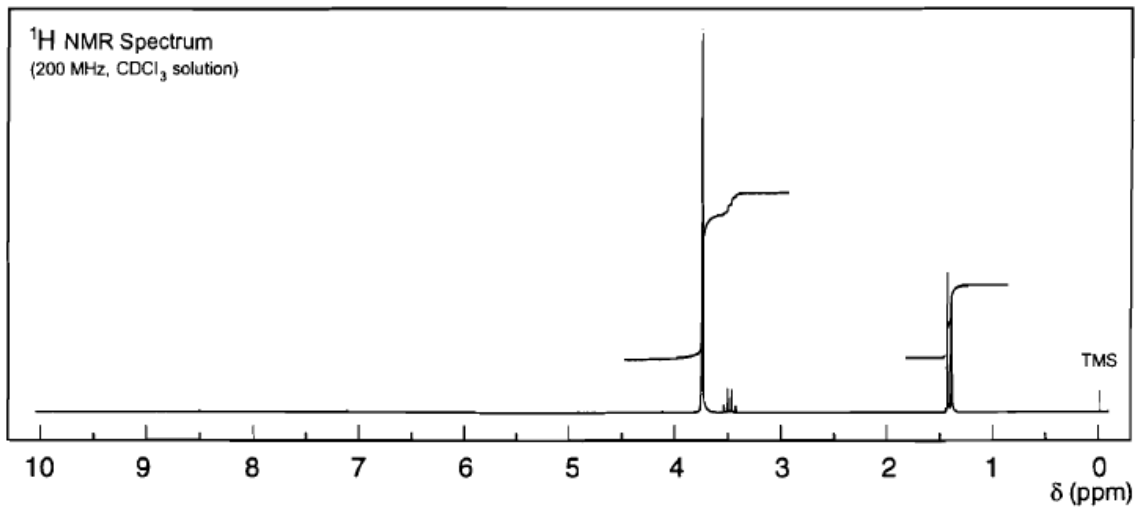
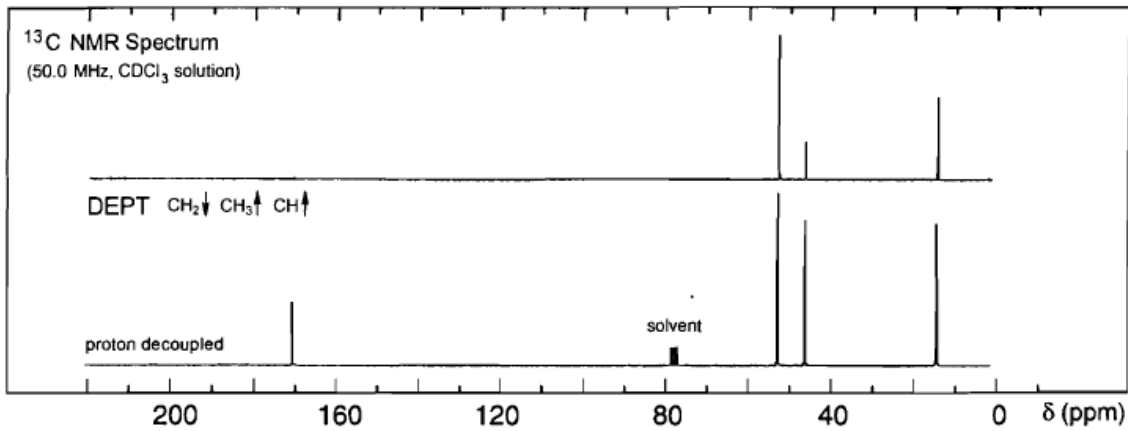
No significant UV  
absorption above 220 nm



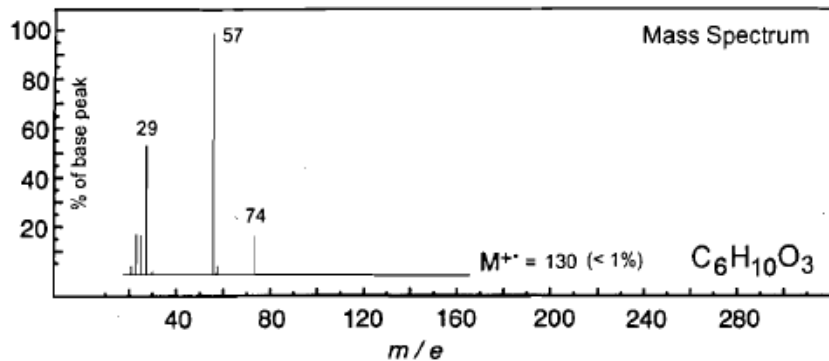
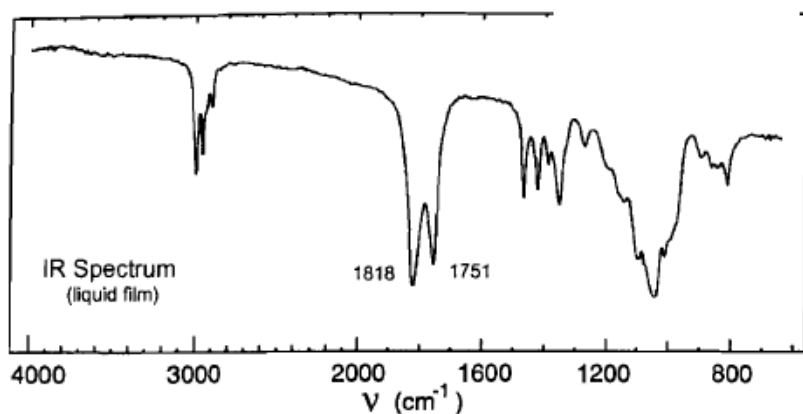
# Problem 46



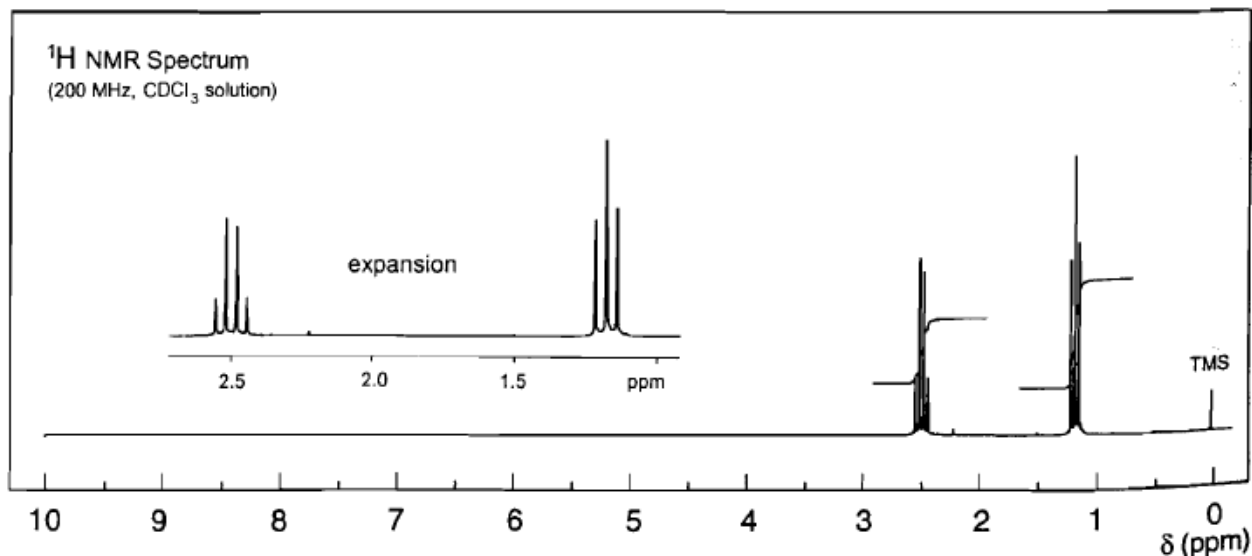
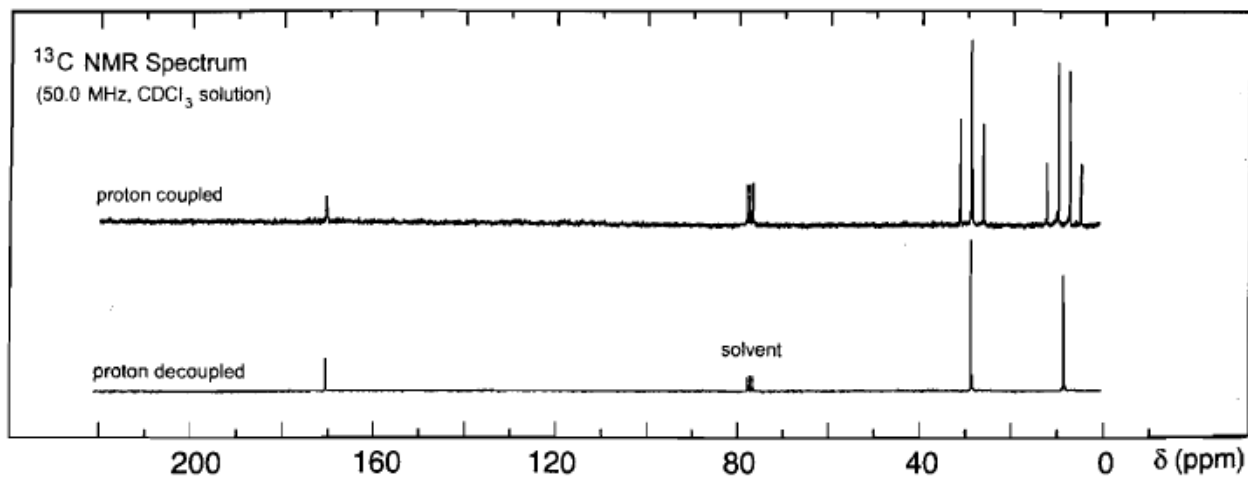
No significant UV  
absorption above 220 nm



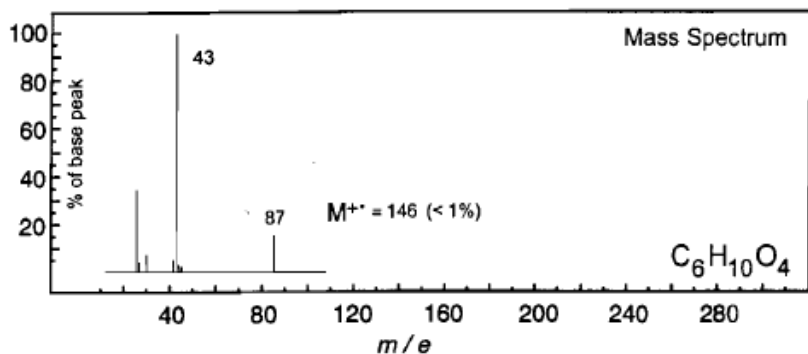
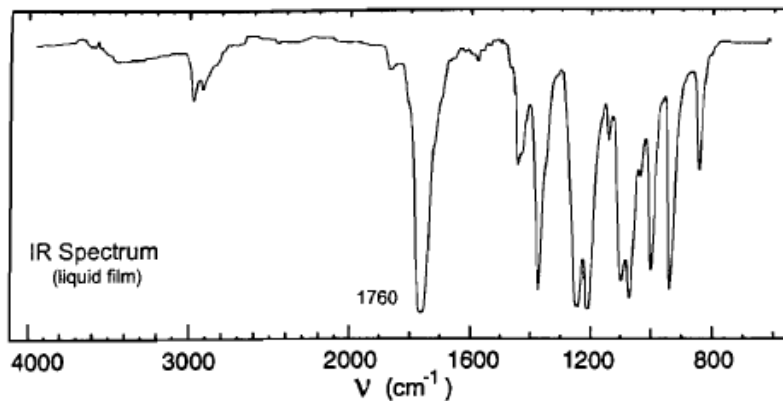
# Problem 41



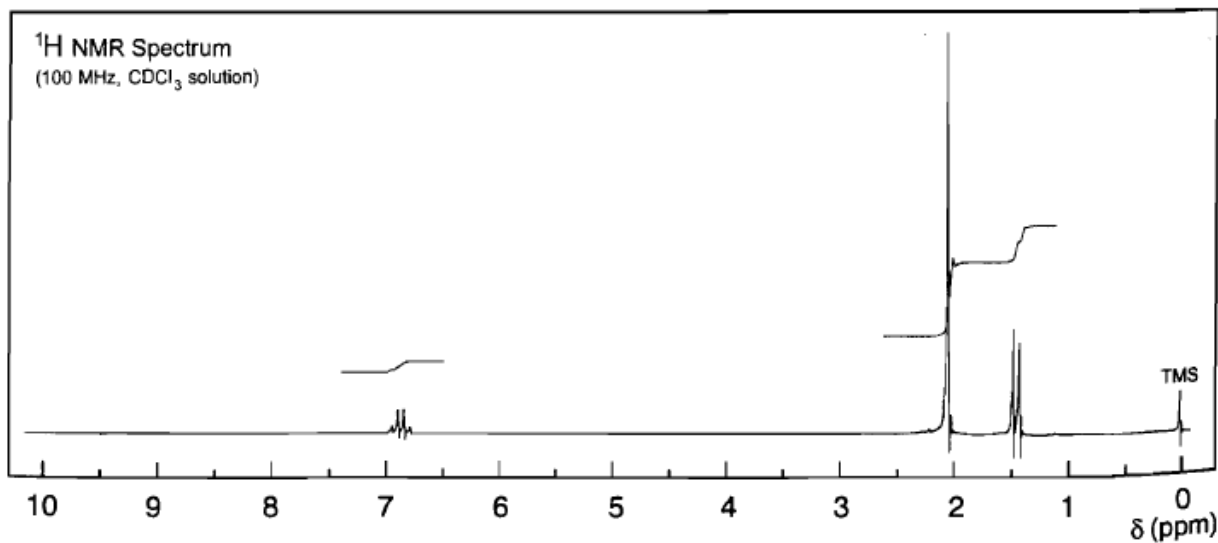
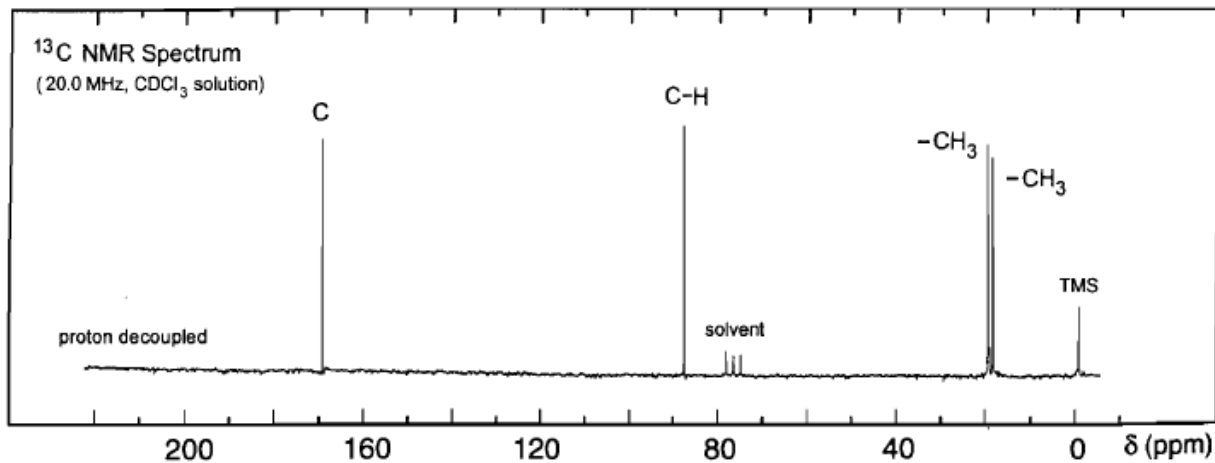
No significant UV  
absorption above 220 nm



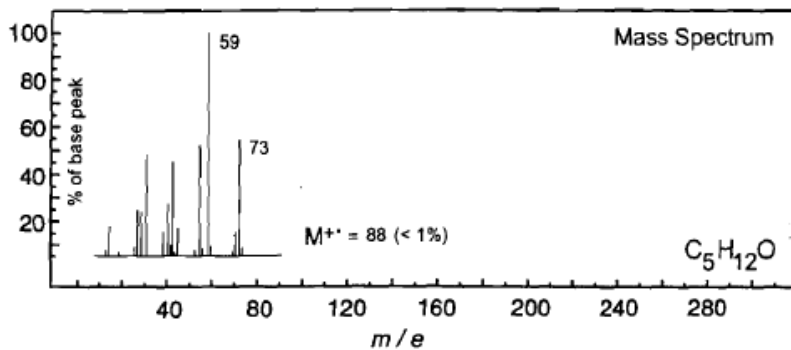
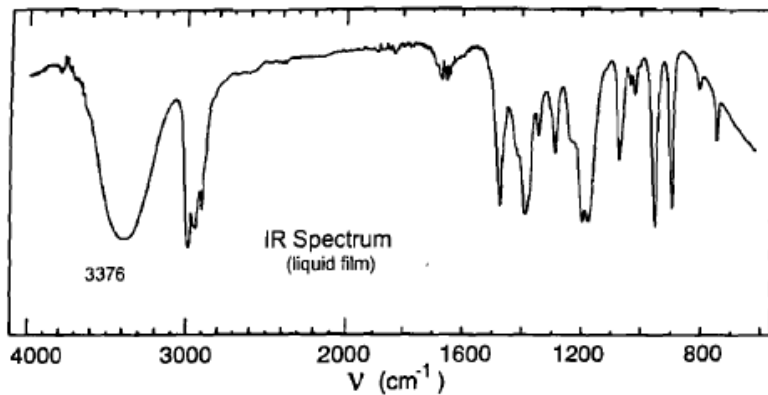
# Problem 45



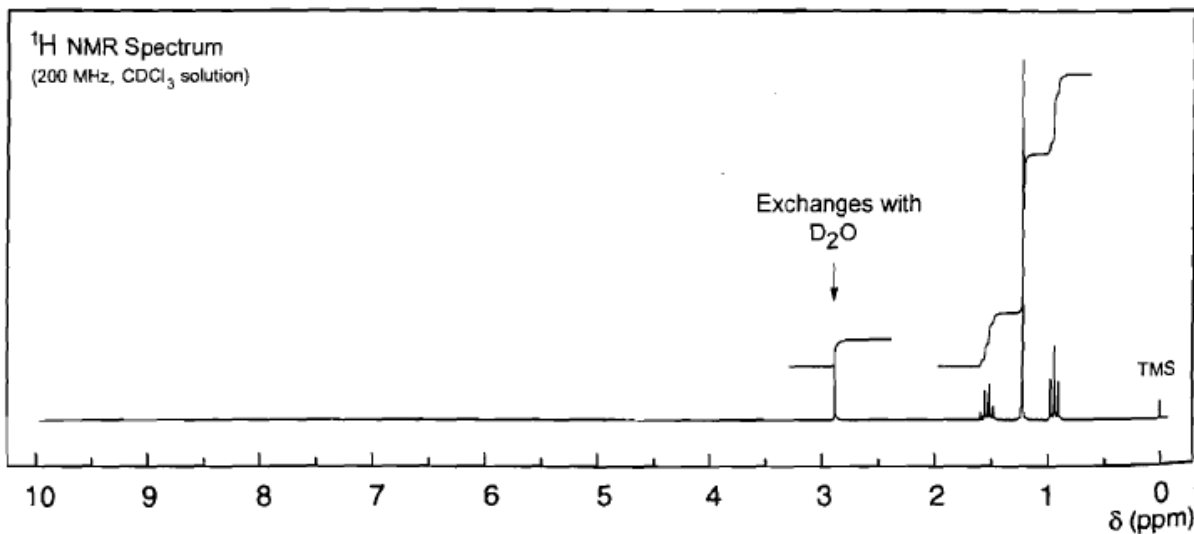
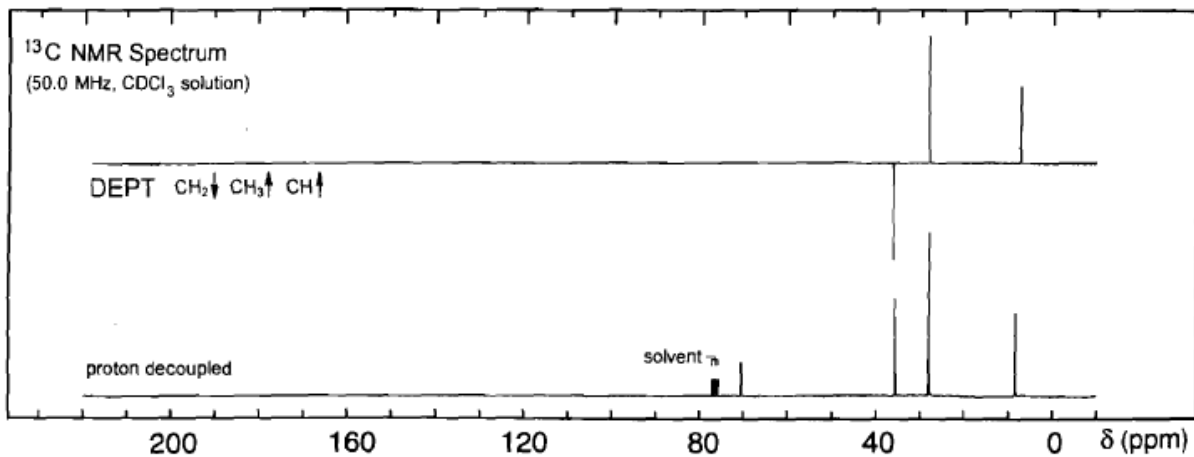
No significant UV  
absorption above 220 nm



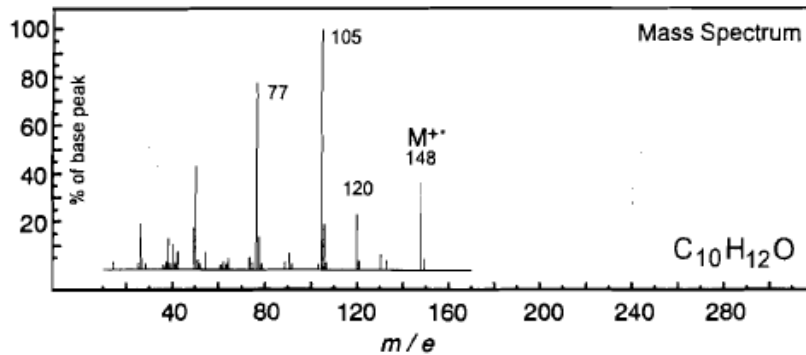
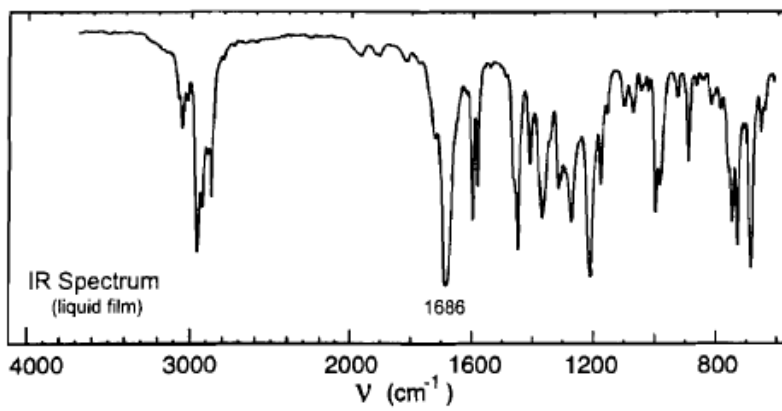
# Problem 73



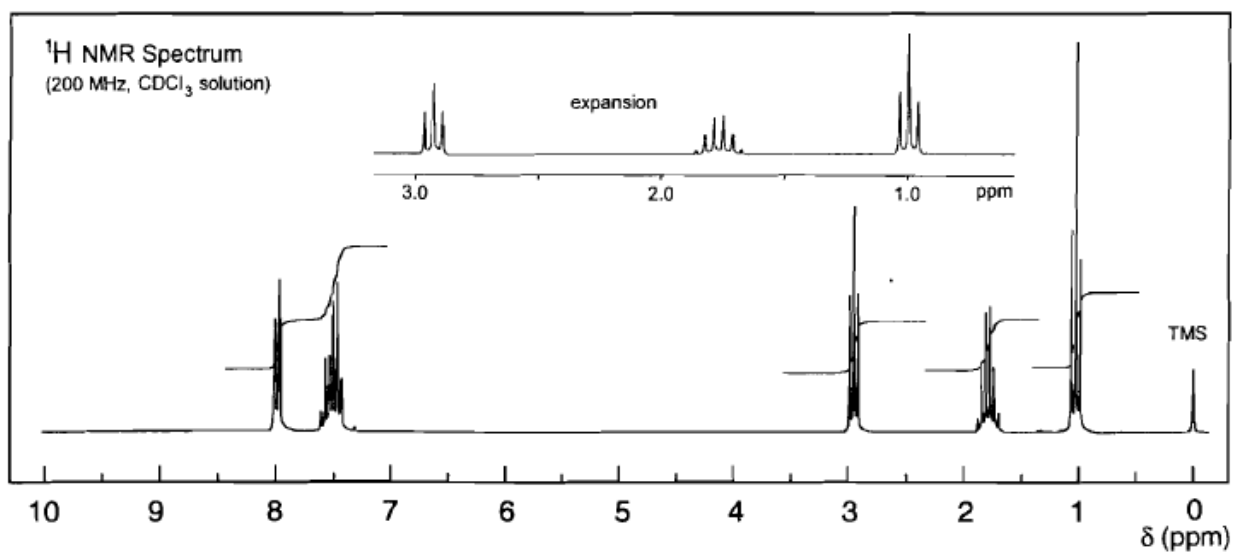
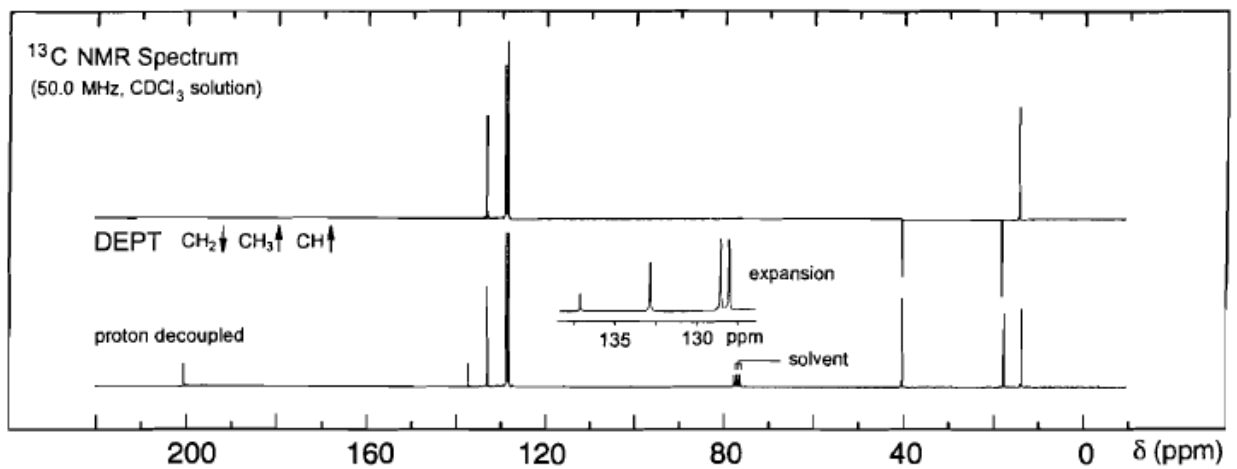
No significant UV  
absorption above 220 nm



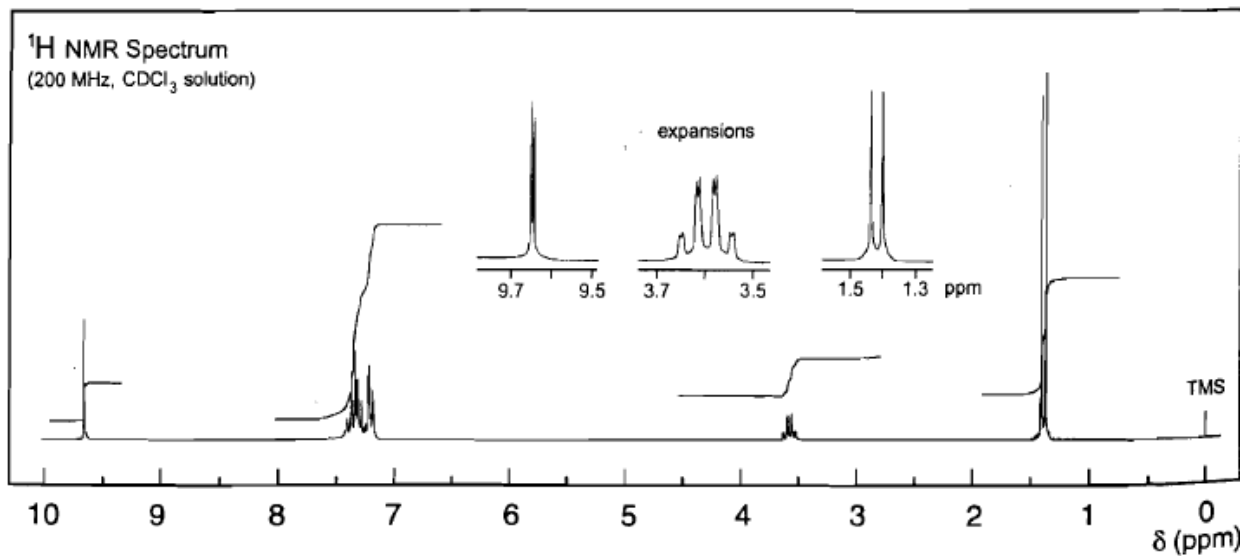
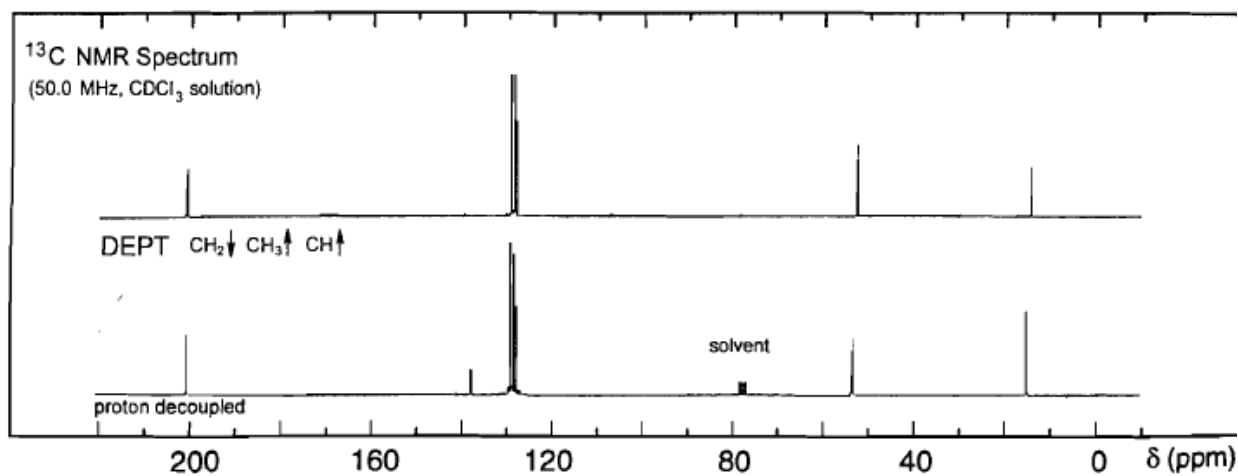
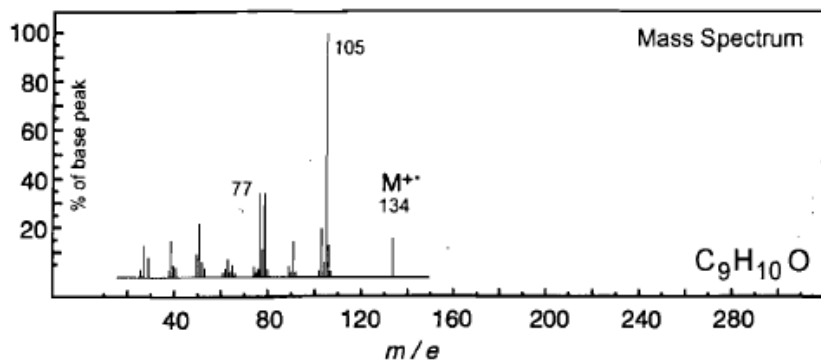
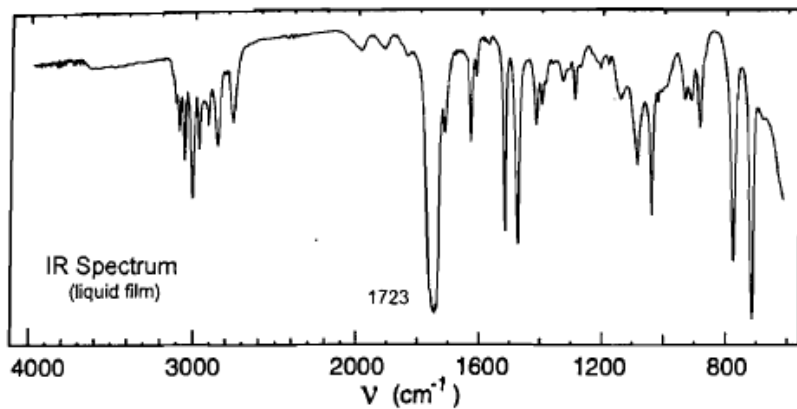
# Problem 32



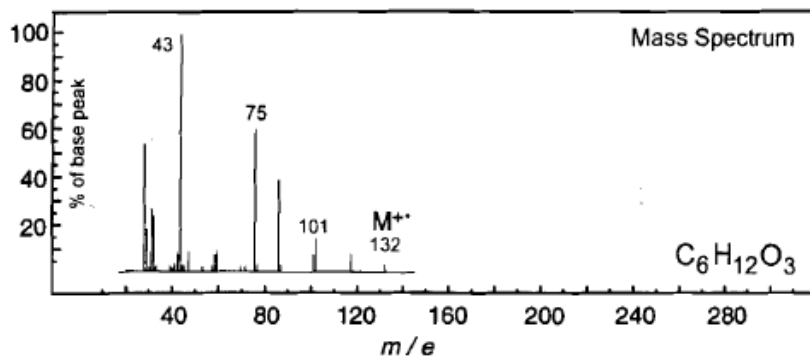
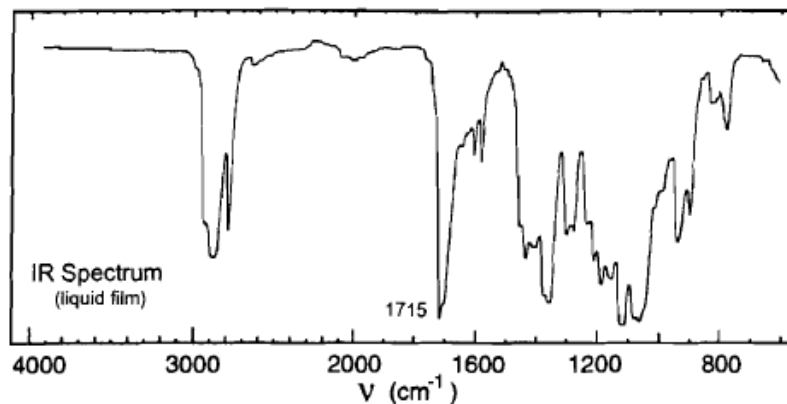
UV Spectrum  
 $\lambda_{\max}$  241 nm ( $\log_{10}\epsilon$  4.1)  
solvent: methanol



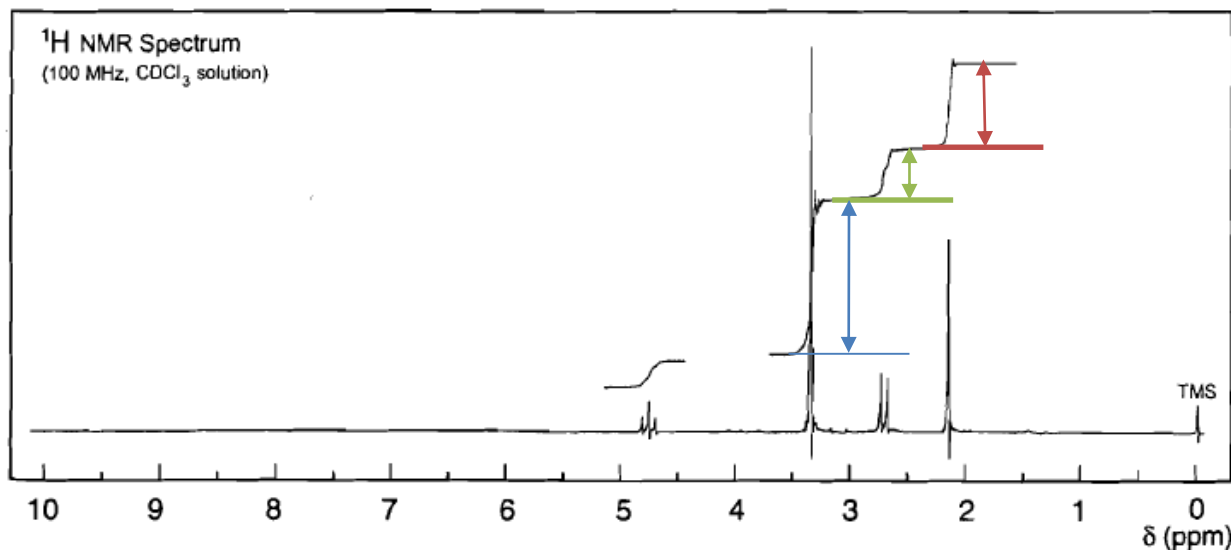
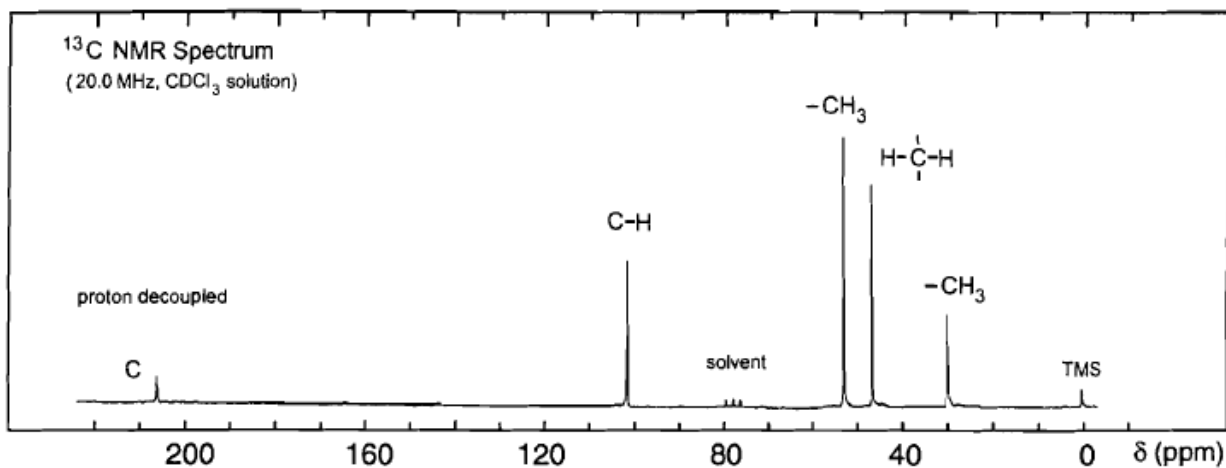
# Problem 31



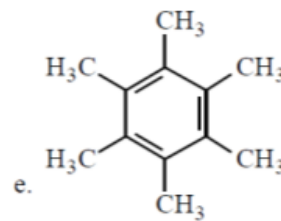
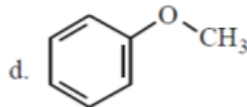
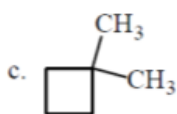
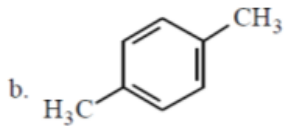
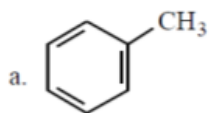
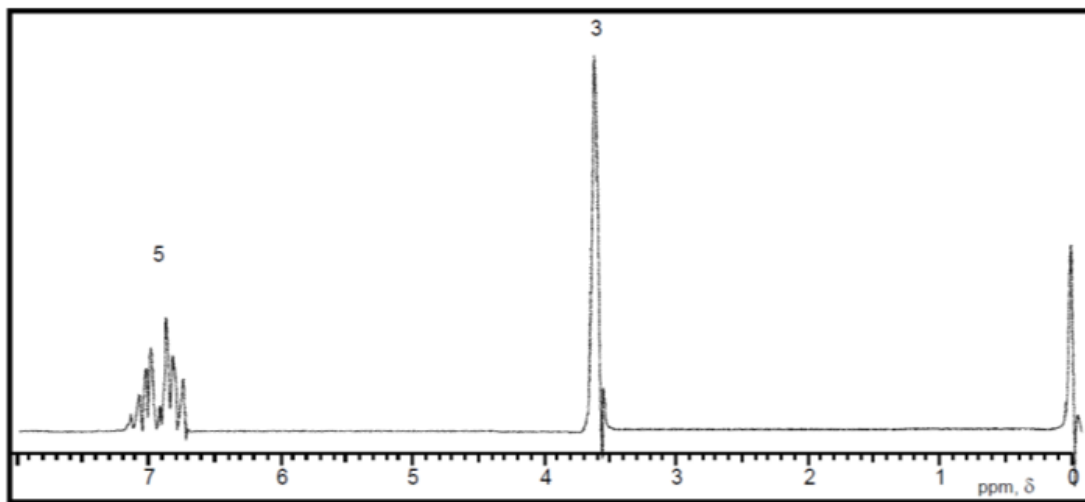
# Problem 76



No significant UV  
absorption above 220 nm

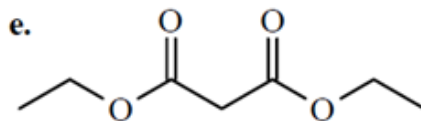
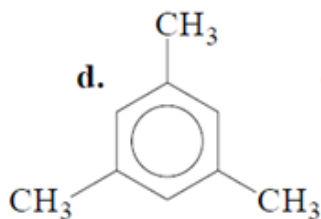
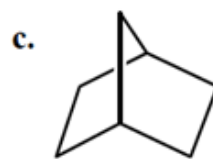
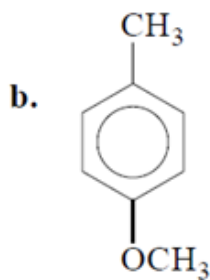
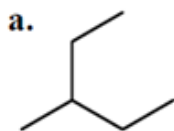


Quale dei seguenti composti le cui strutture chimiche sono riportate di seguito (A-E) risulta in accordo con il seguente spettro  $^1\text{H-NMR}$  ?

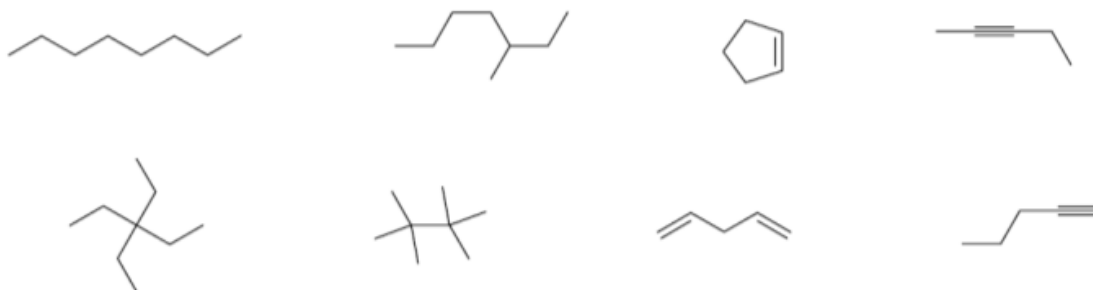


Indica il numero di picchi che ti aspetti di osservare in un esperimento  $^{13}\text{C}$  NMR disaccoppiato al protone (proton decoupled ) per le molecola riportate in basso

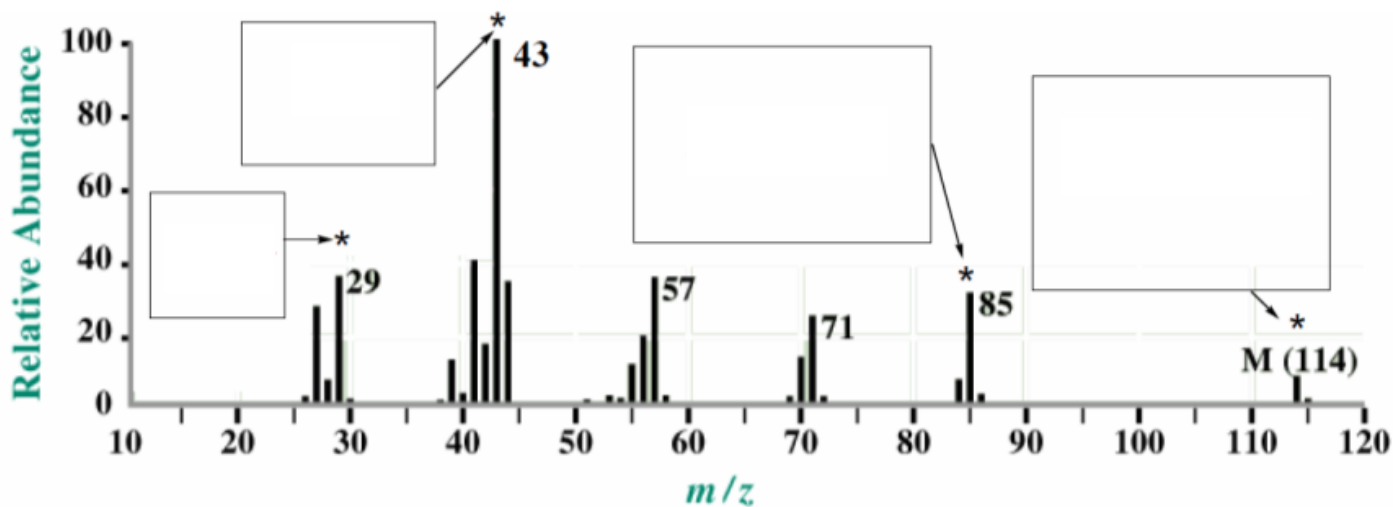
- a. \_\_\_\_\_  
b. \_\_\_\_\_  
c. \_\_\_\_\_  
d. \_\_\_\_\_  
e. \_\_\_\_\_



Quale delle seguenti strutture risultano in accordo con il seguente spettro di massa ? Poi disegna il catione frammento vicino ad ogni picco indicato con l'asterisco



A.



13. An unknown compound is a high-boiling liquid (boiling point 256° C) which is slightly soluble in water. The peak at 3.9 ppm in the <sup>1</sup>H NMR disappears if the compound is exposed to D<sub>2</sub>O. The Mass, IR, and <sup>1</sup>H NMR spectra, along with <sup>13</sup>C NMR data, are given below. Analysis: C<sub>9</sub>H<sub>12</sub>O<sub>2</sub>. Provide an interpretation for each of the spectra and give the structure of the compound. (25 points, total)

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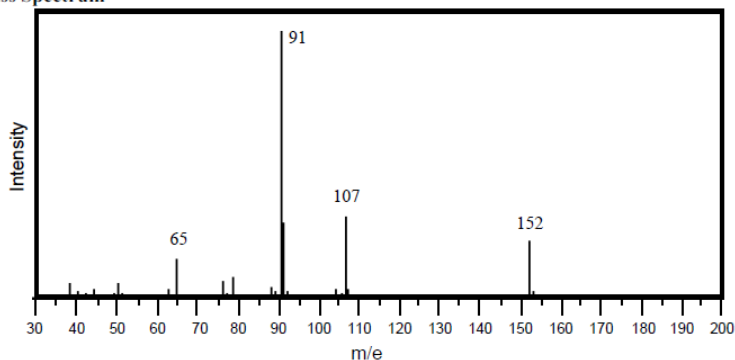
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Mass Spectrum



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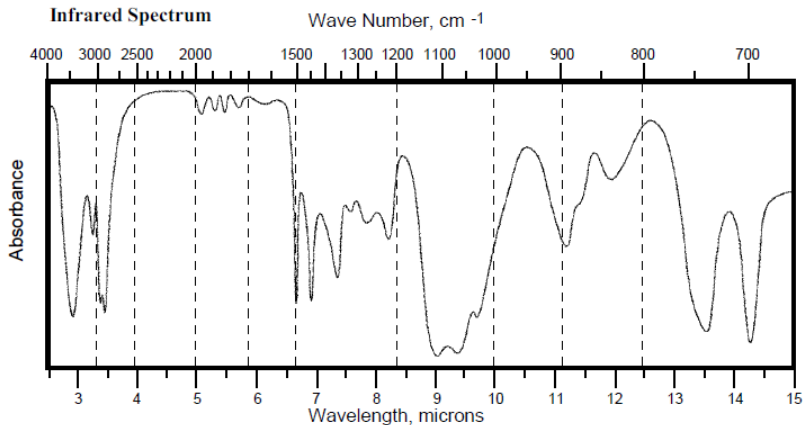
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Infrared Spectrum



<sup>1</sup>H NMR

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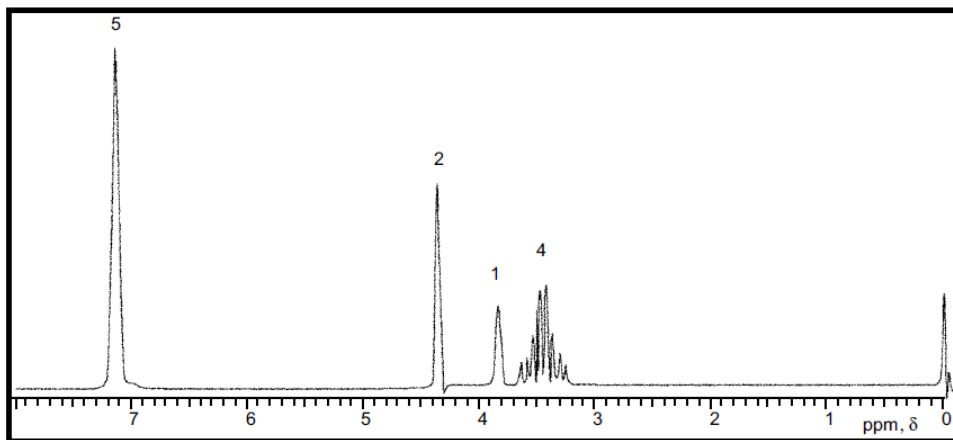
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<sup>13</sup>C Spectral Data:

- singlet, 137.2 ppm;
- doublet, 128.4 ppm;
- doublet, 127.6 ppm;
- doublet, 127.5 ppm;
- triplet, 81.6 ppm;
- triplet, 79.5 ppm;
- triplet, 67.1 ppm

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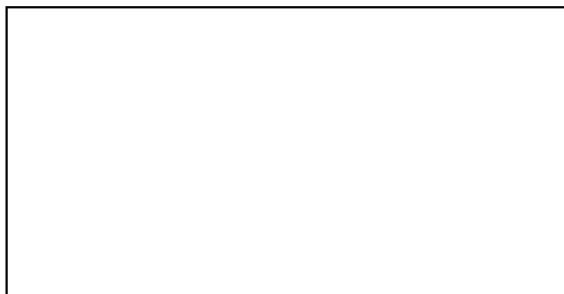
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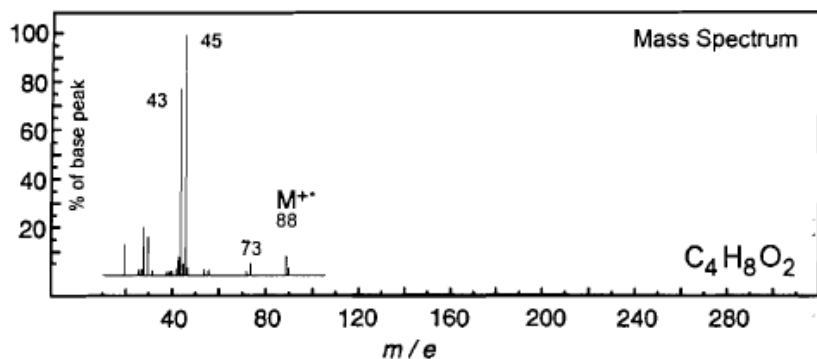
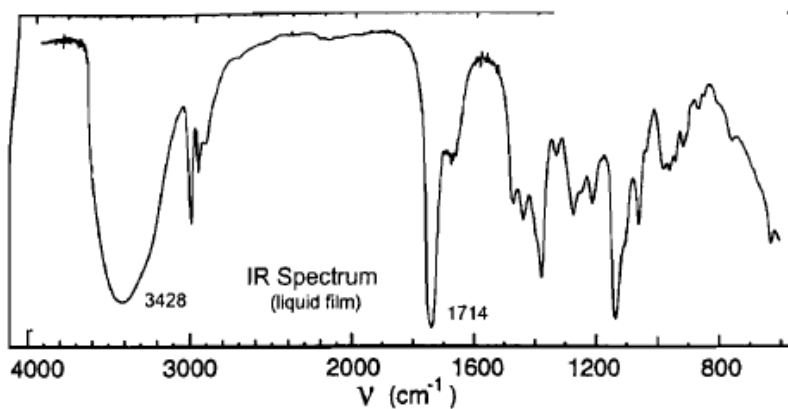
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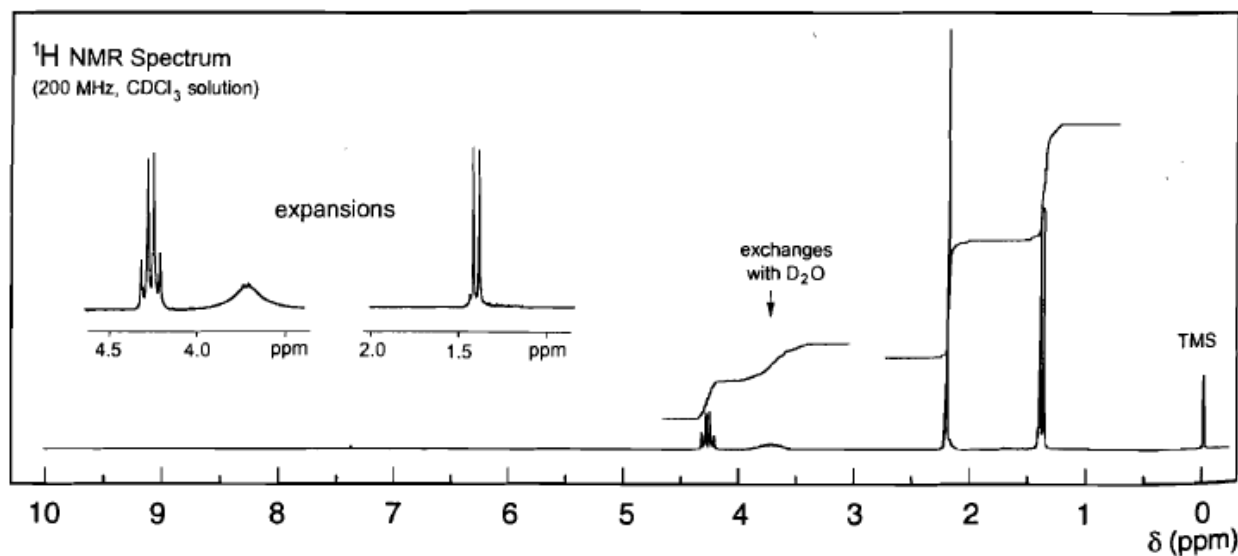
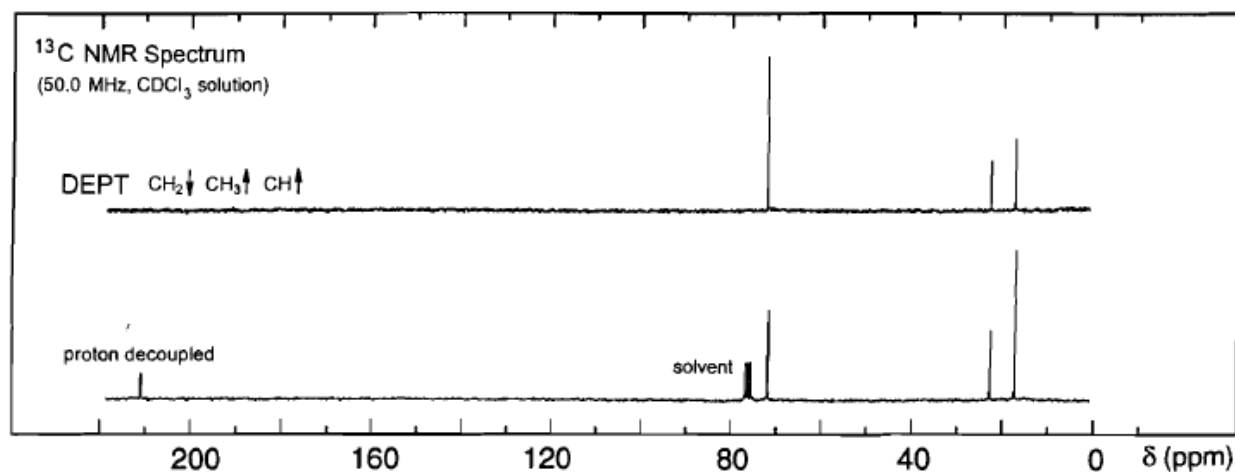
Structure:



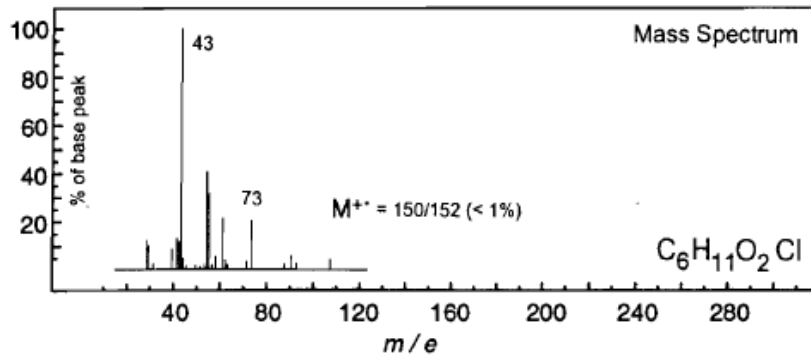
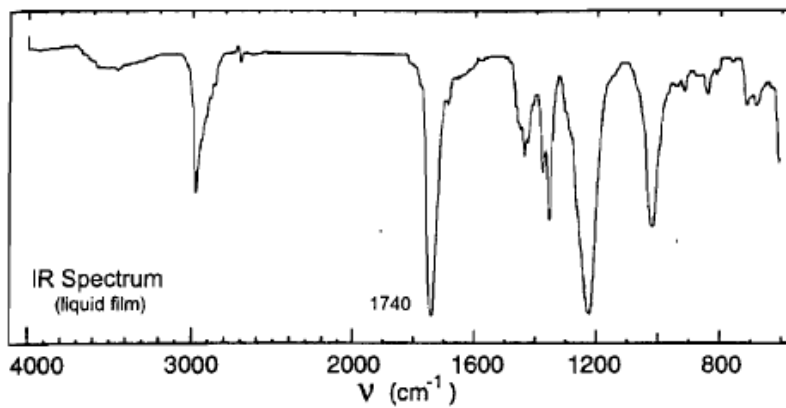
# Problem 69



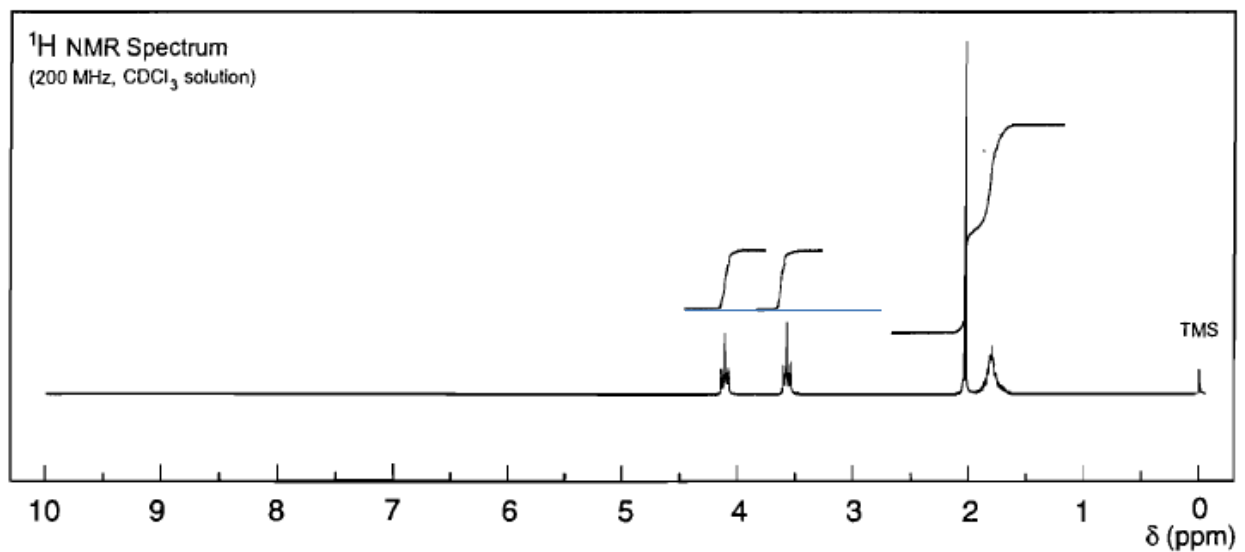
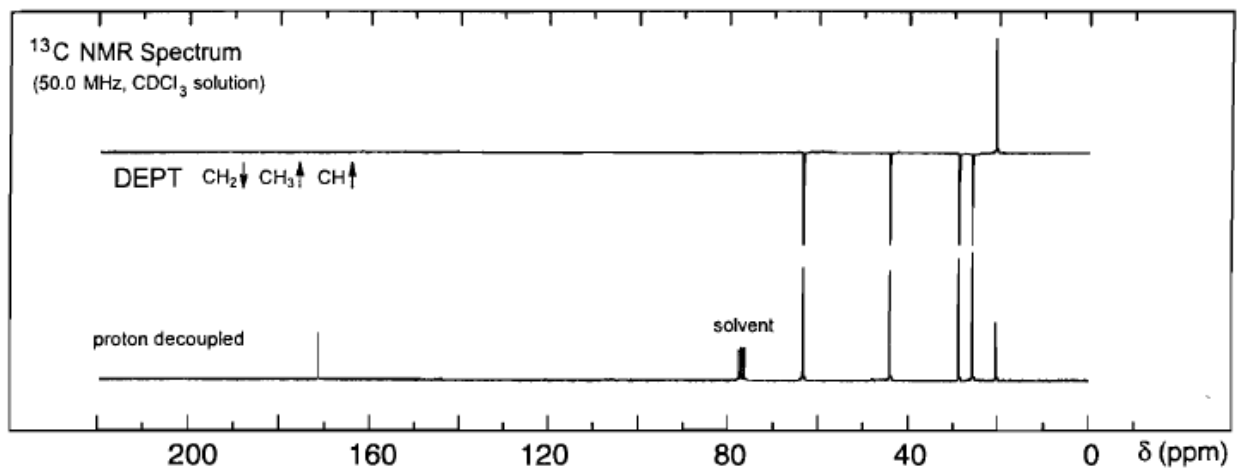
No strong UV  
absorption above 220 nm



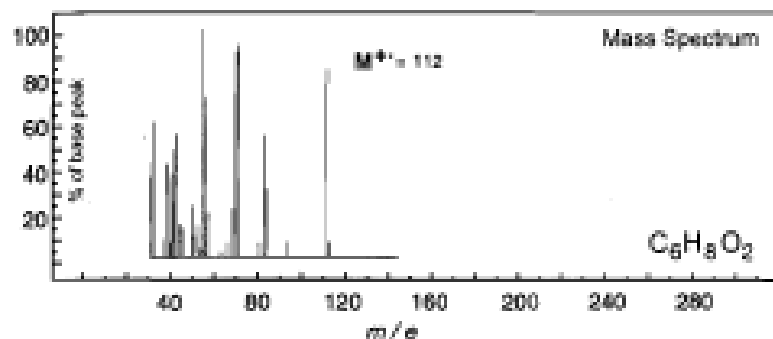
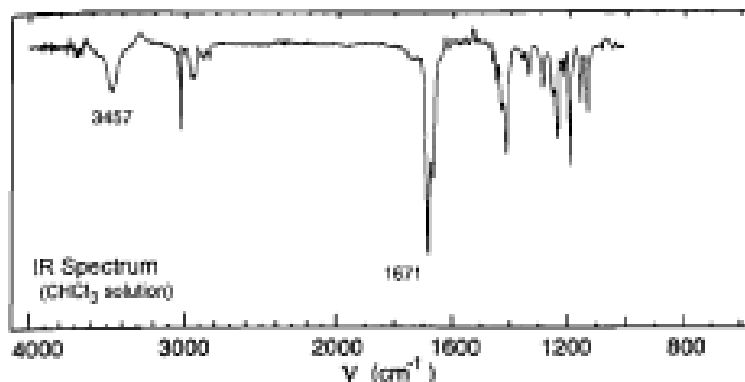
# Problem 84



No significant UV  
absorption above 220 nm



# Problem 166

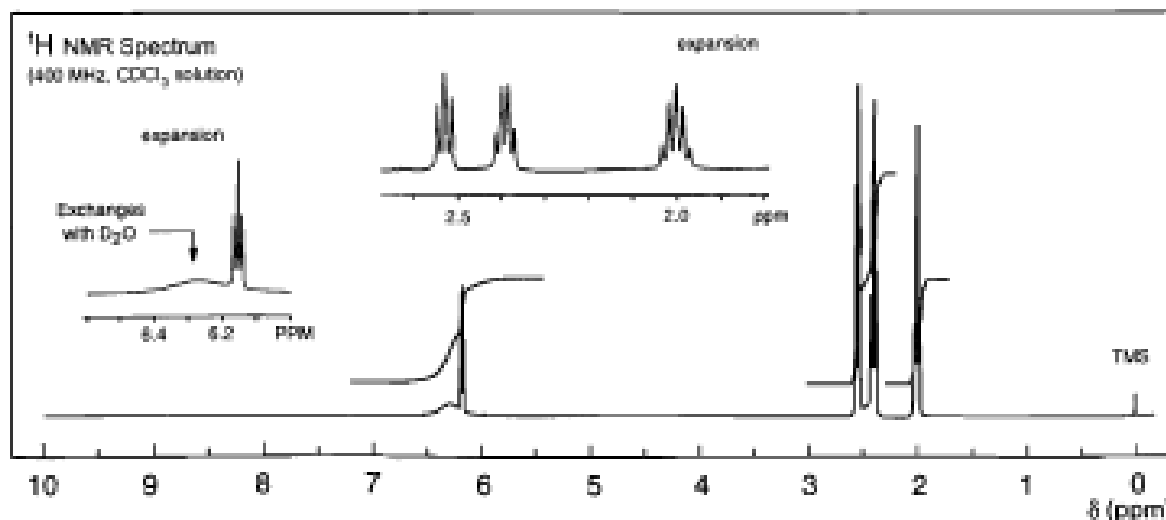
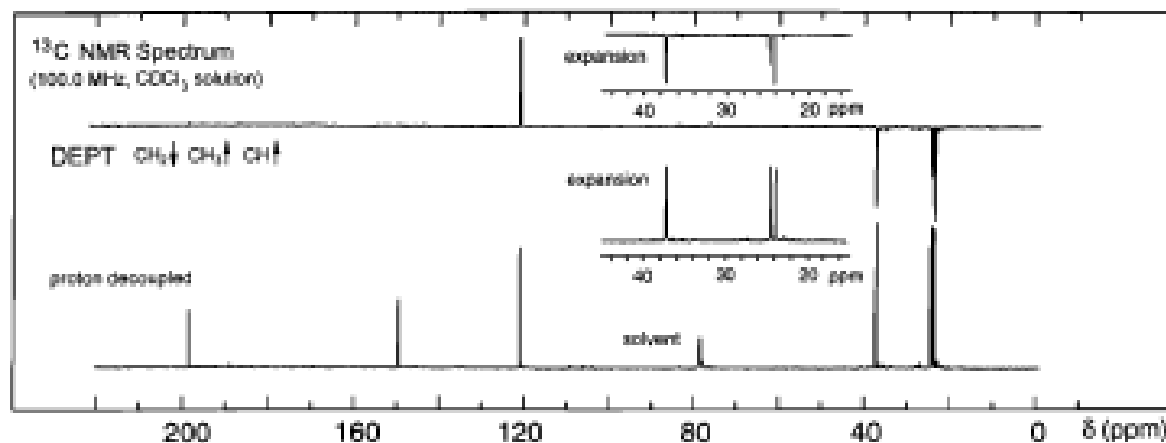


UV Spectrum

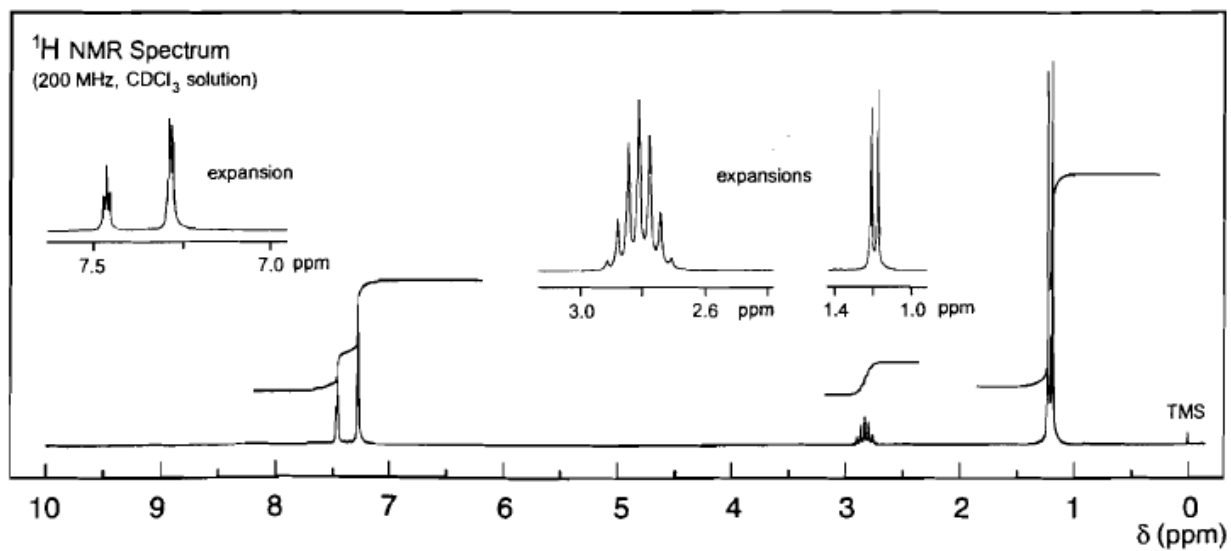
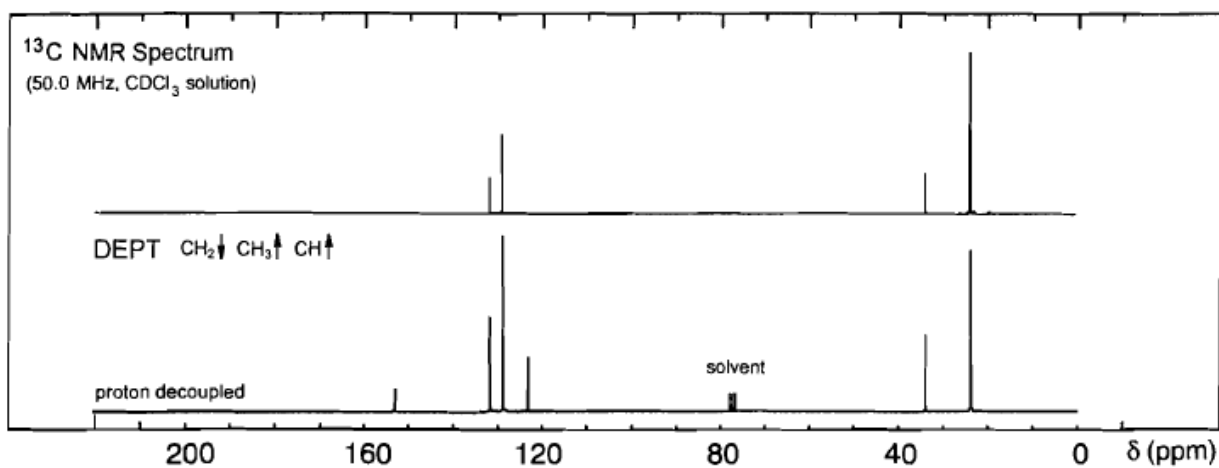
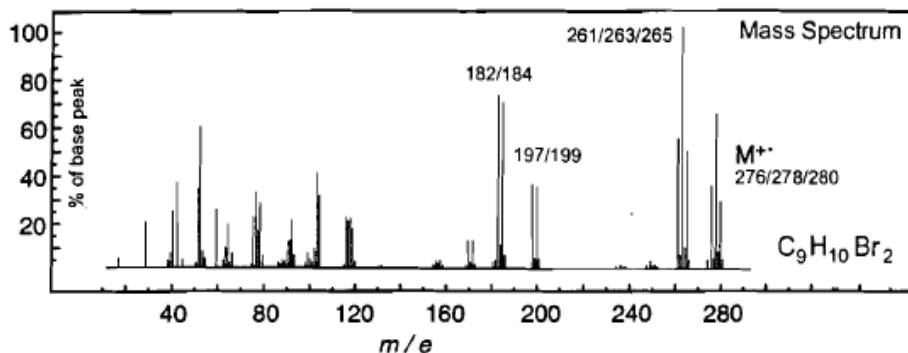
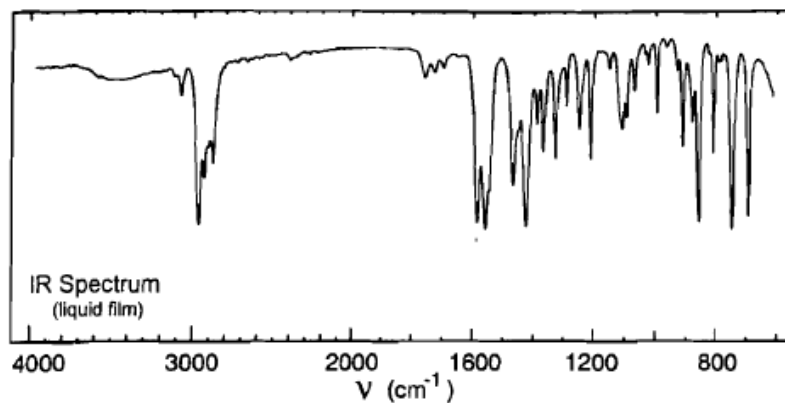
$\lambda_{max}$  263 nm ( $\log_{10} \epsilon$  3.9)

$\lambda_{max}$  305 nm ( $\log_{10} \epsilon$  2.1)

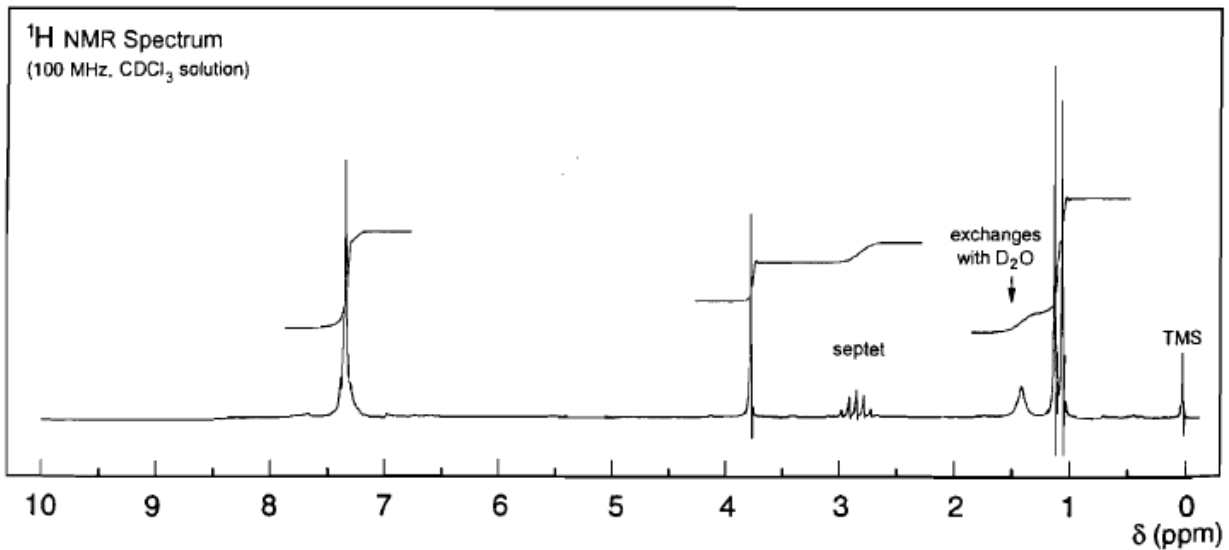
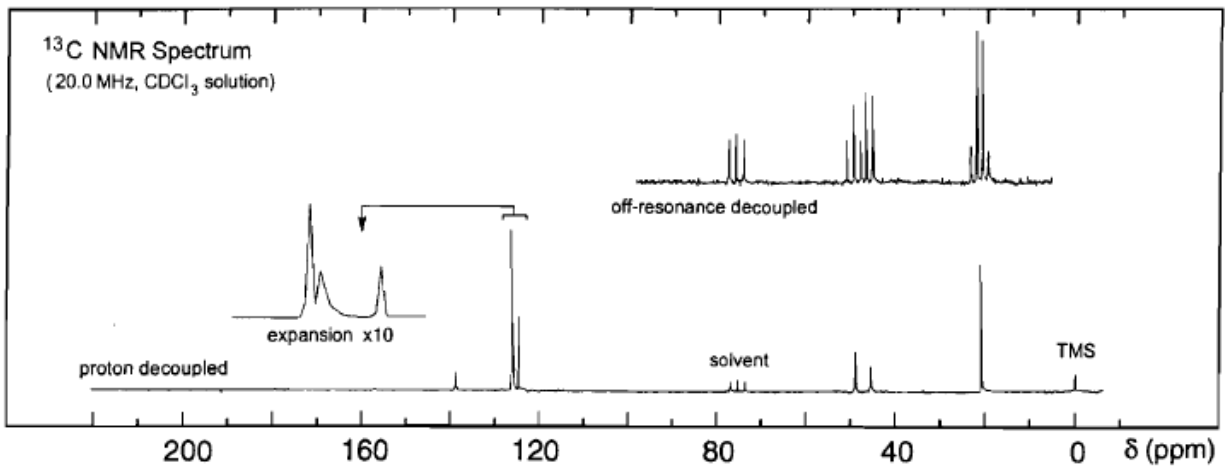
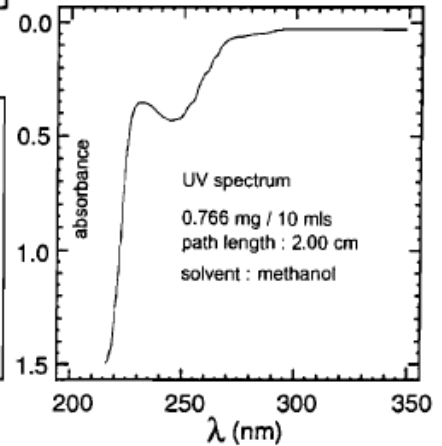
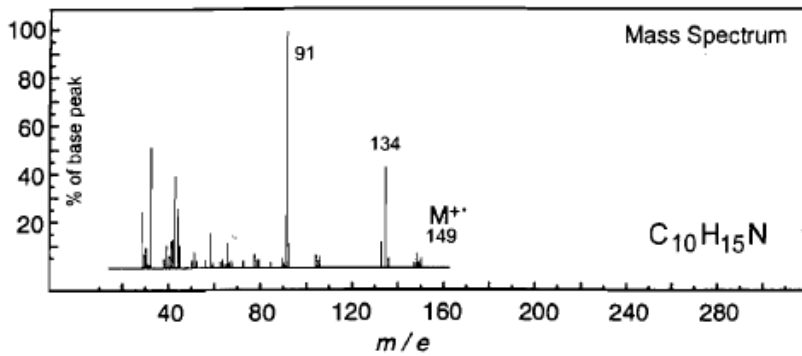
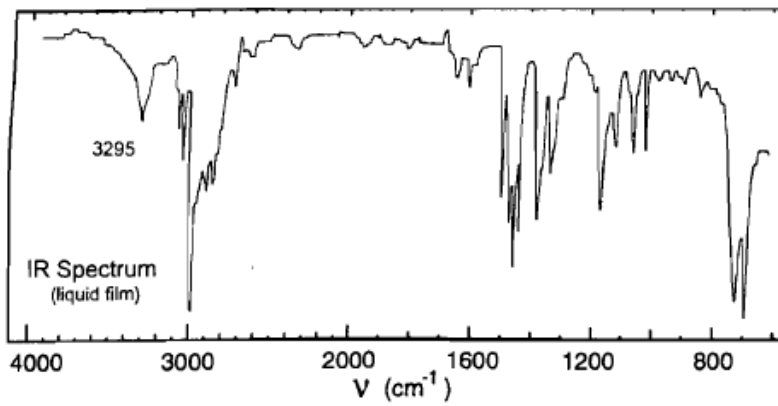
solvent: hexane



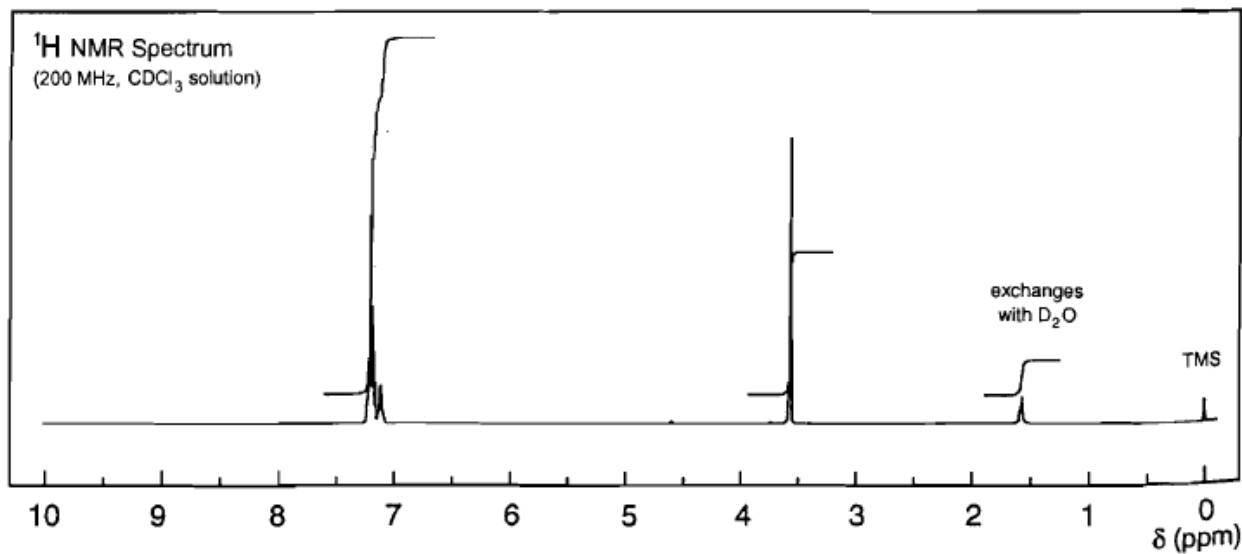
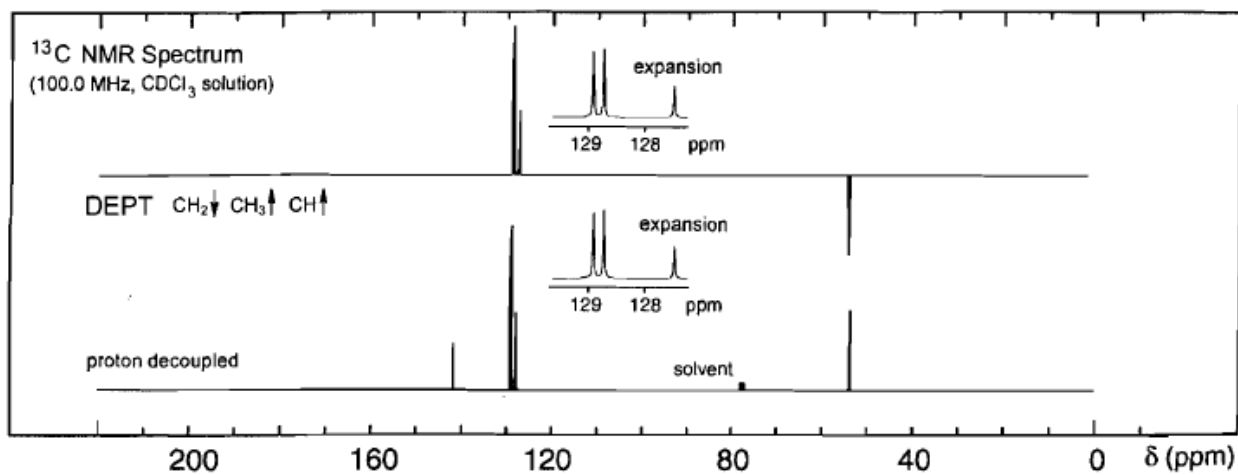
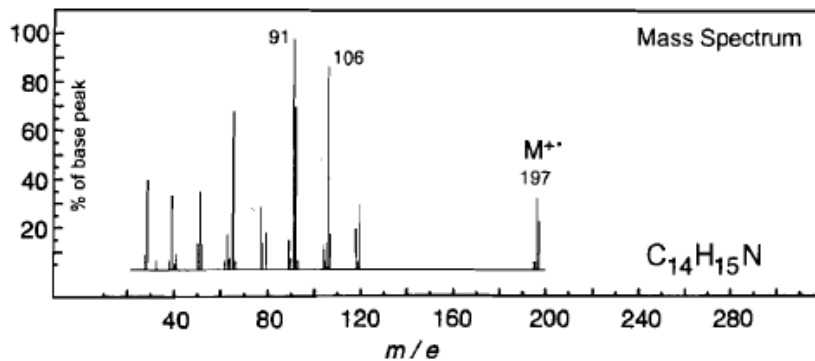
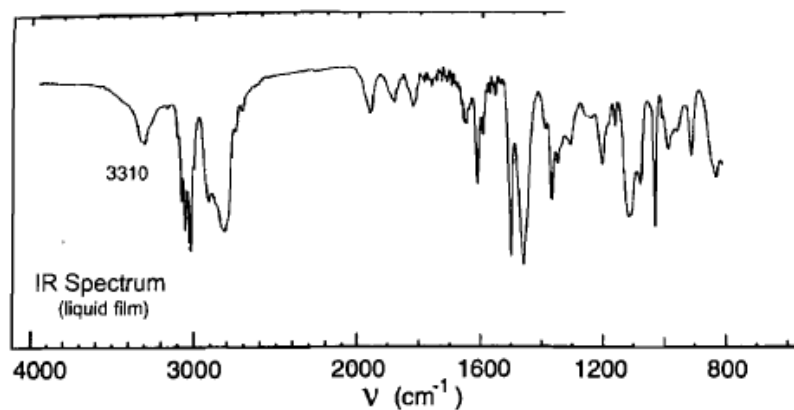
# Problem 158



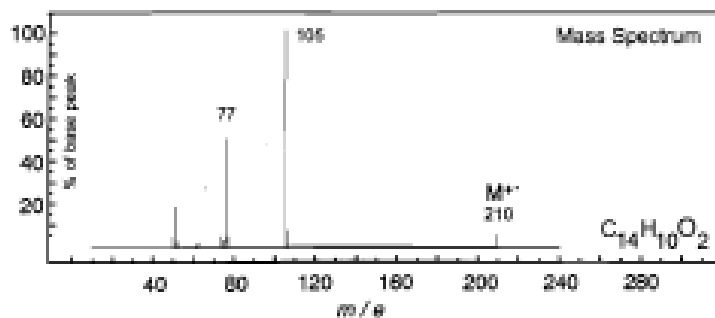
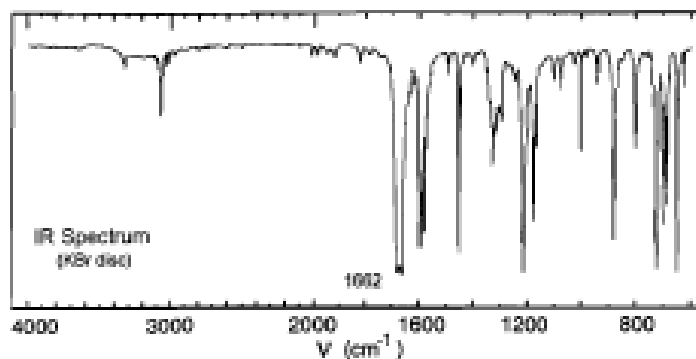
# Problem 129



# Problem 37



# Problem 35



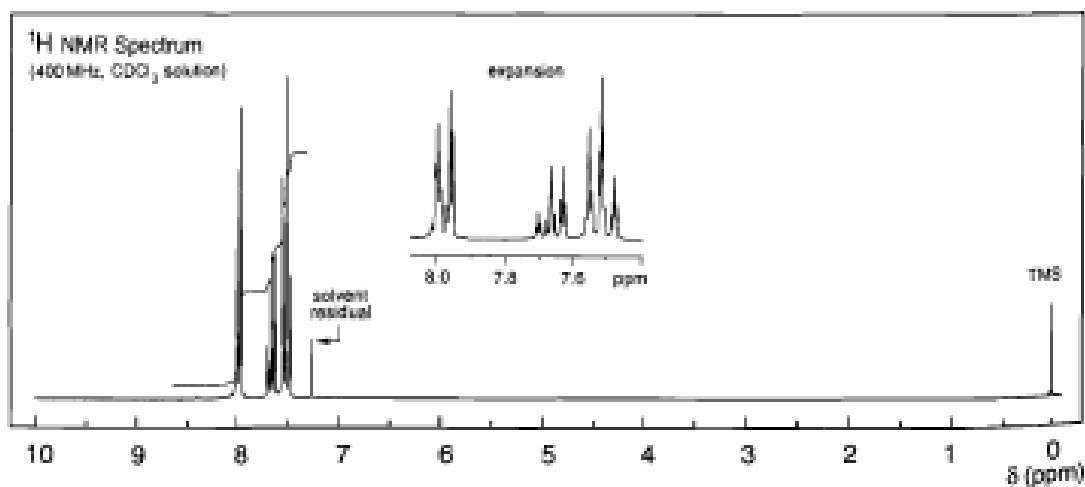
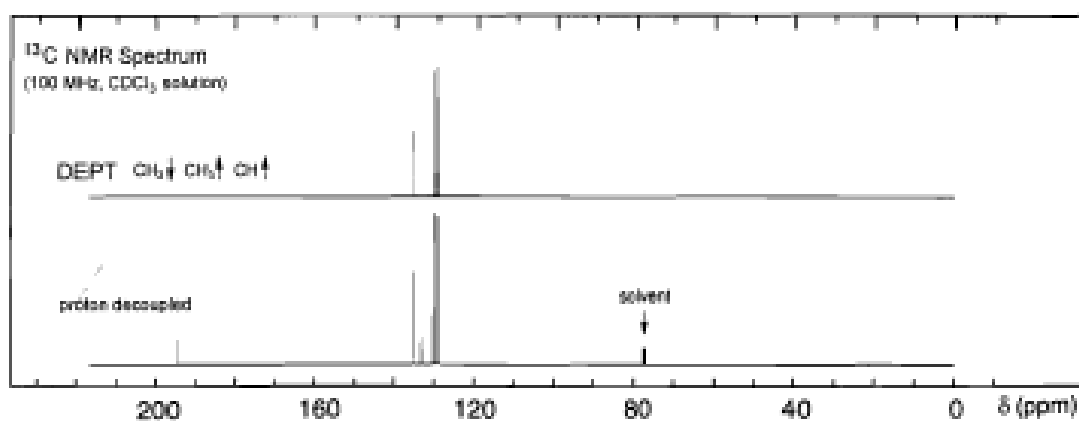
UV Spectrum

$\lambda_{\text{max}}$  258 nm ( $\log_{10} \epsilon$  4.2)

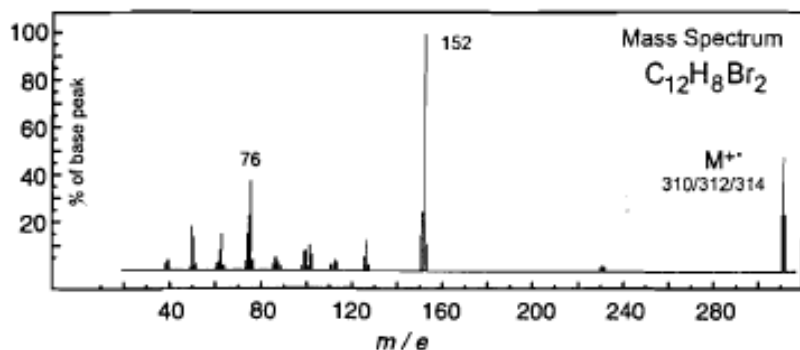
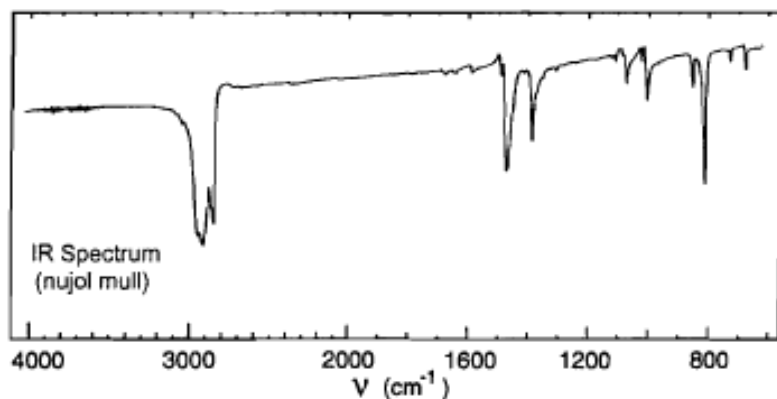
$\lambda_{\text{max}}$  330 nm ( $\log_{10} \epsilon$  2.8)

$\lambda_{\text{max}}$  388 nm ( $\log_{10} \epsilon$  2.2)

solvent: ethanol



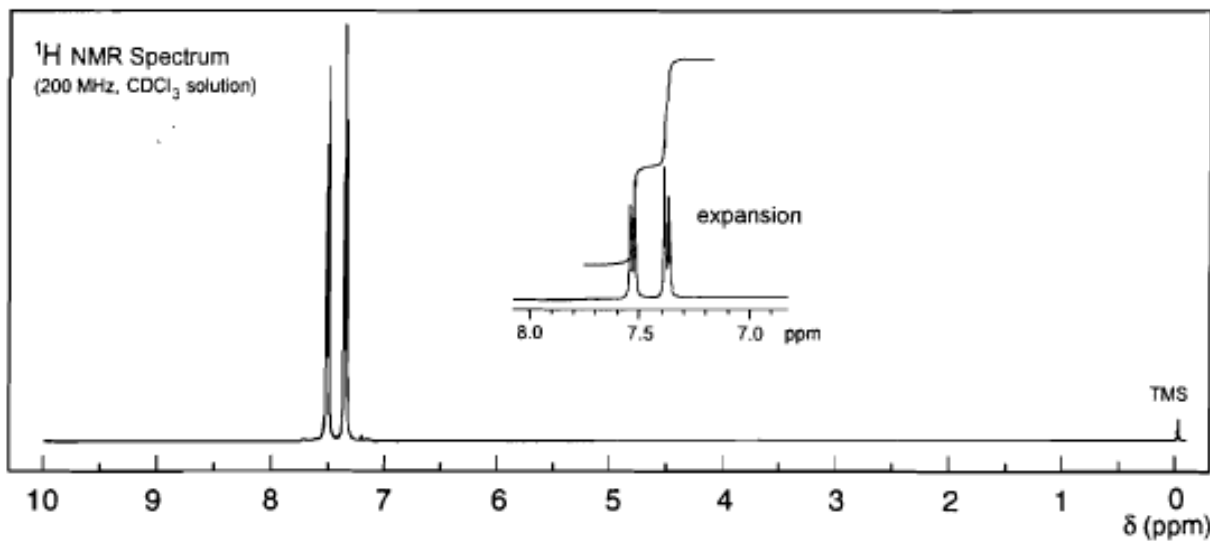
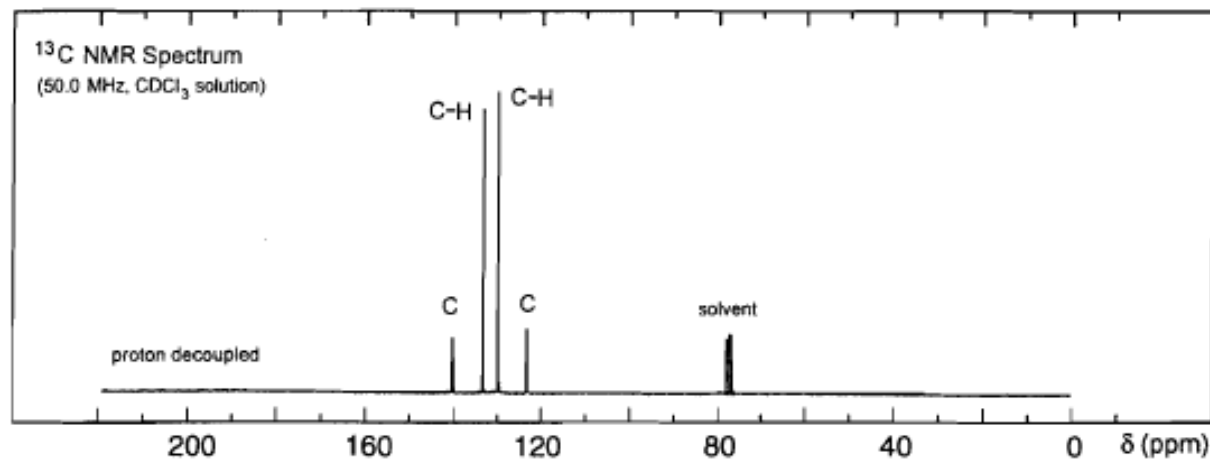
# Problem 52



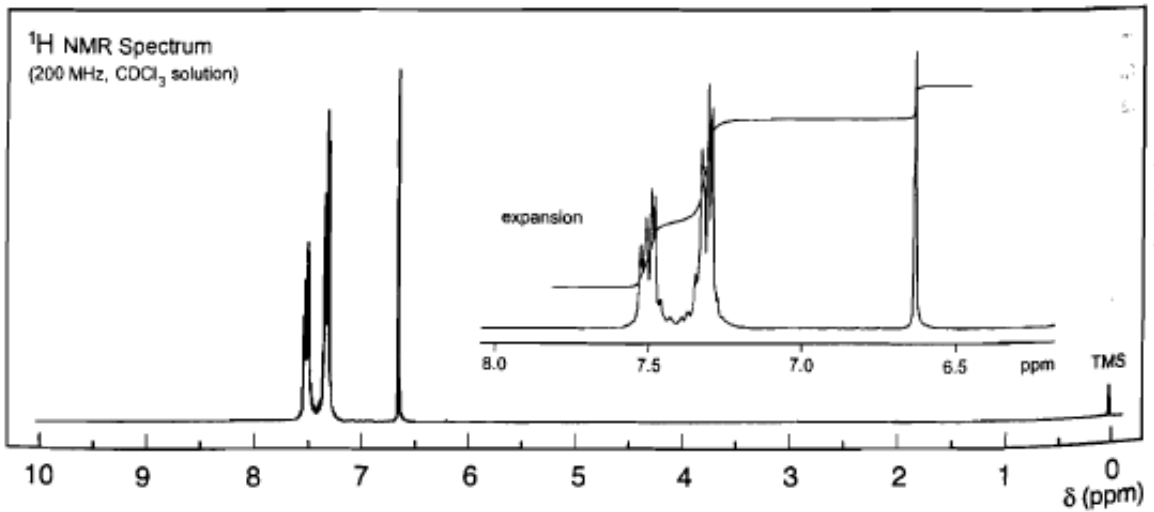
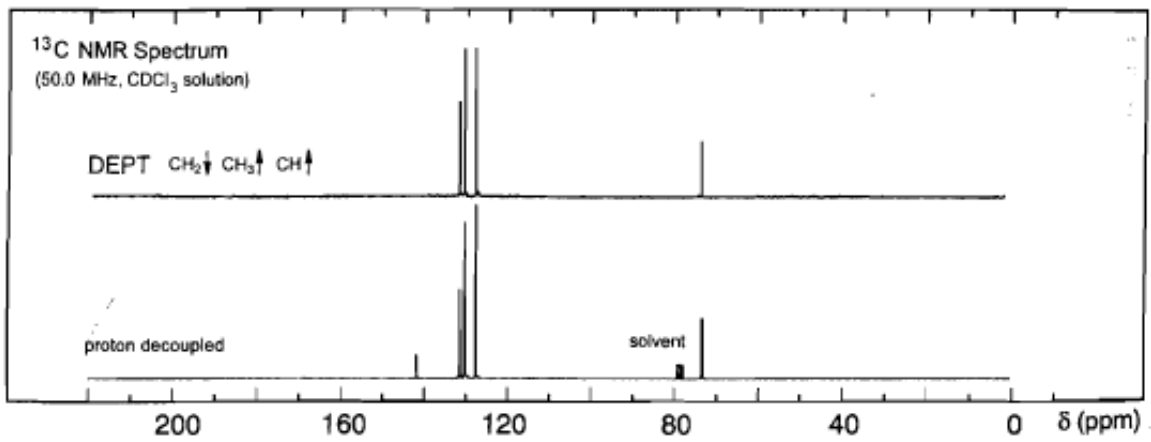
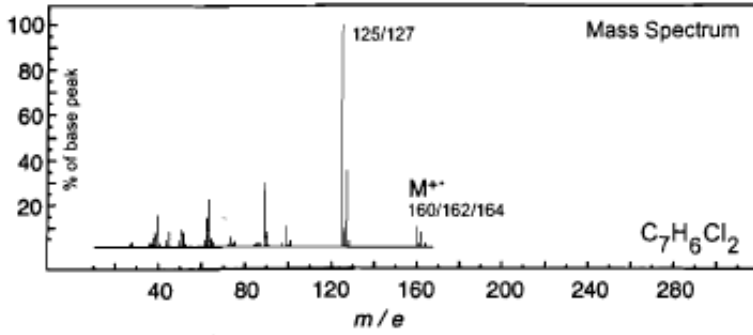
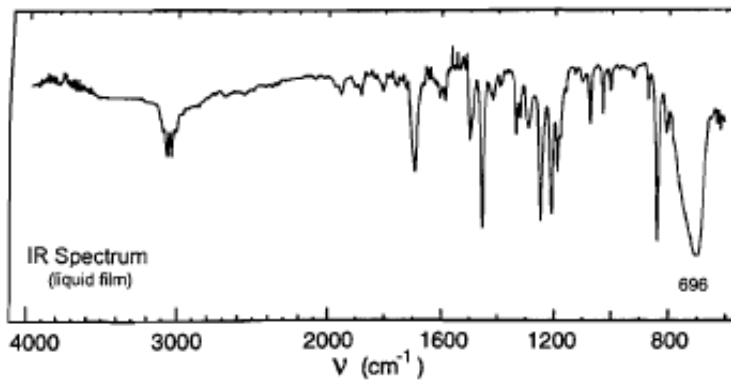
UV Spectrum

$\lambda_{\text{max}}$  264 nm ( $\log_{10} \epsilon$  4.5)

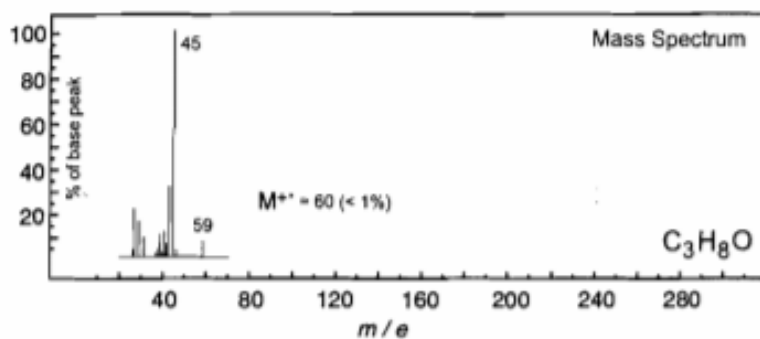
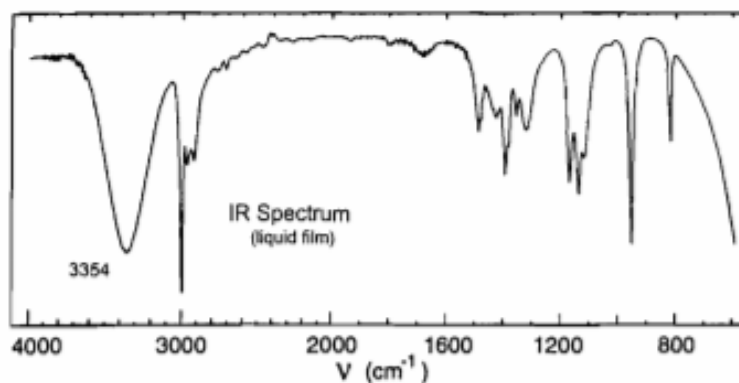
solvent : methanol



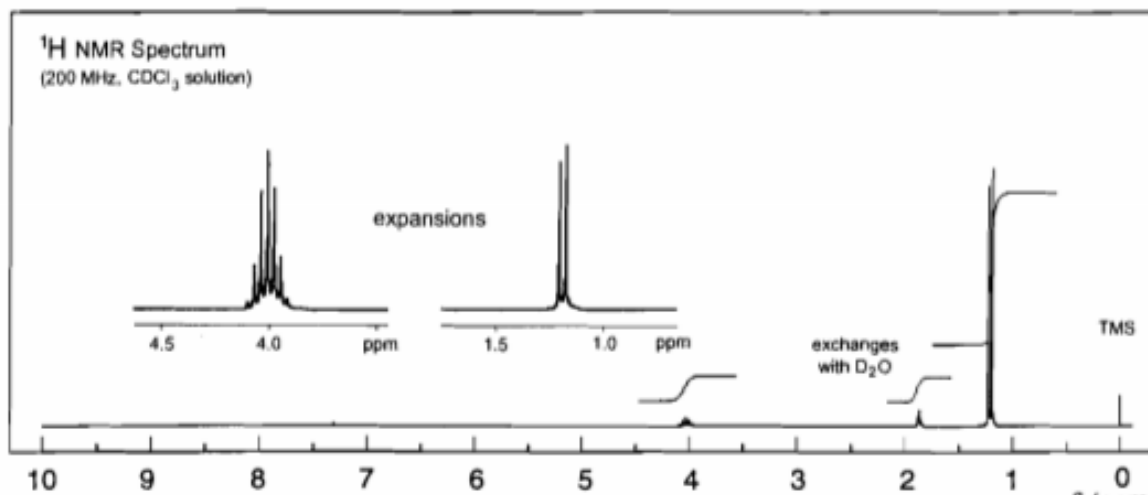
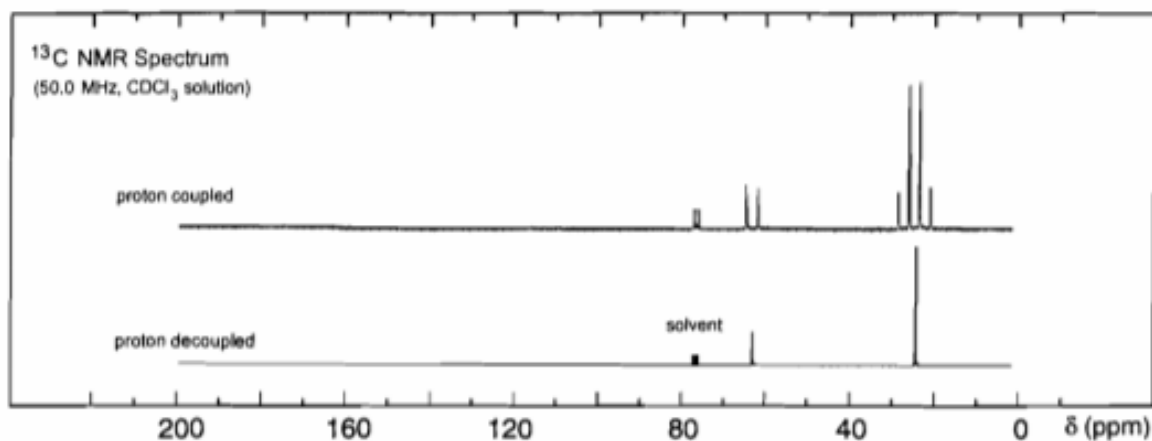
# Problem 53



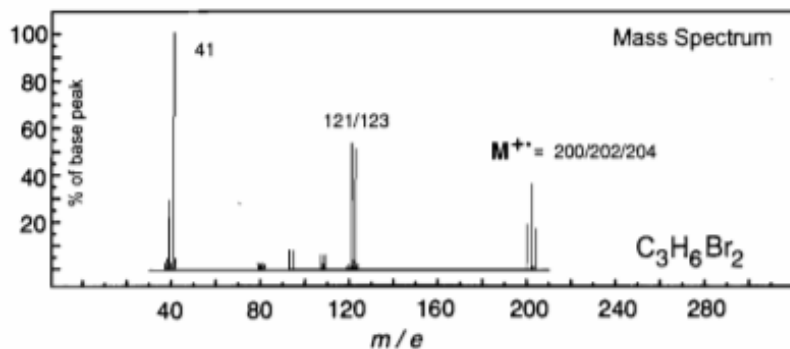
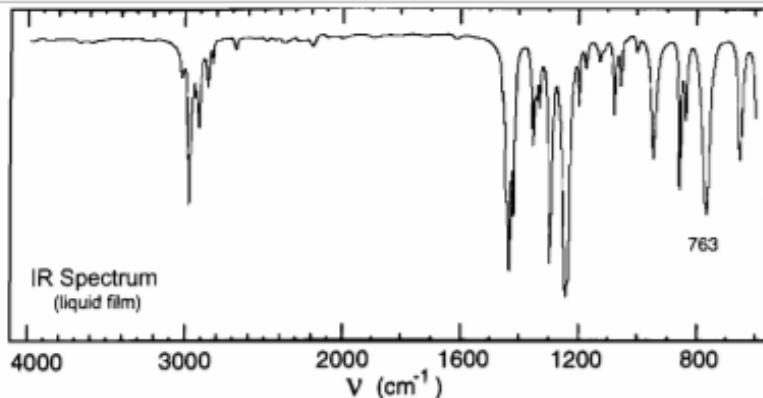
# Problem 14



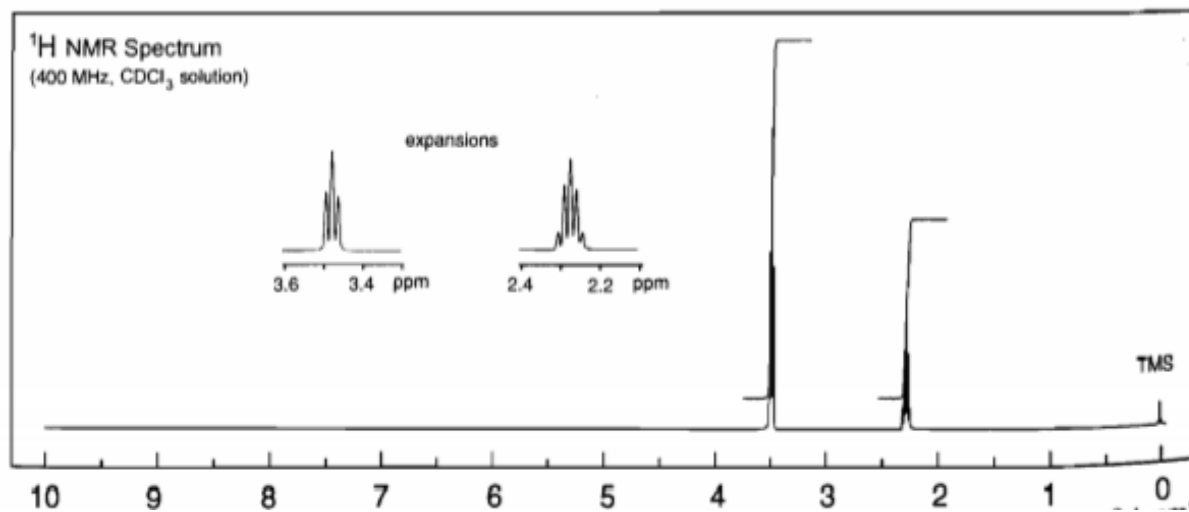
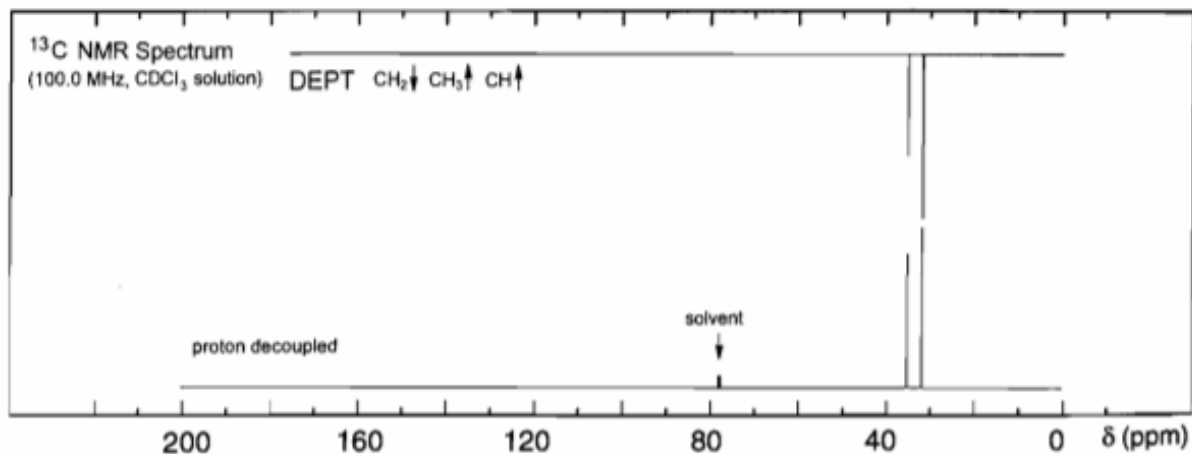
No significant UV  
absorption above 220 nm



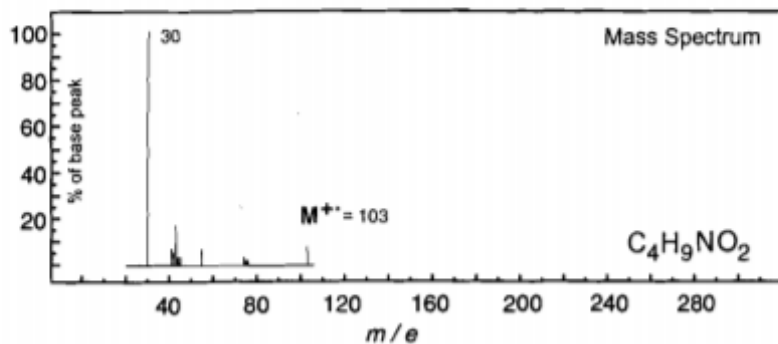
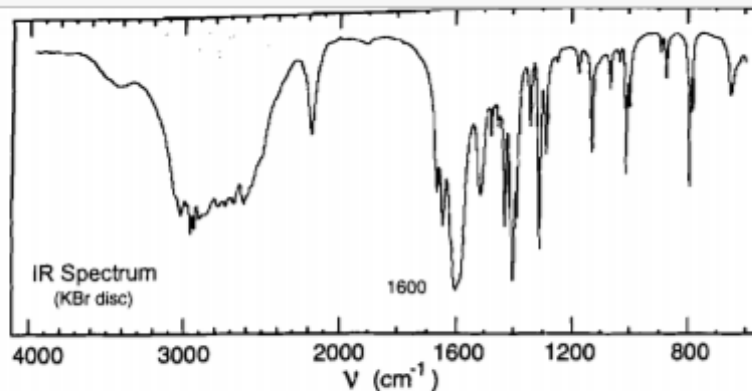
# Problem 17



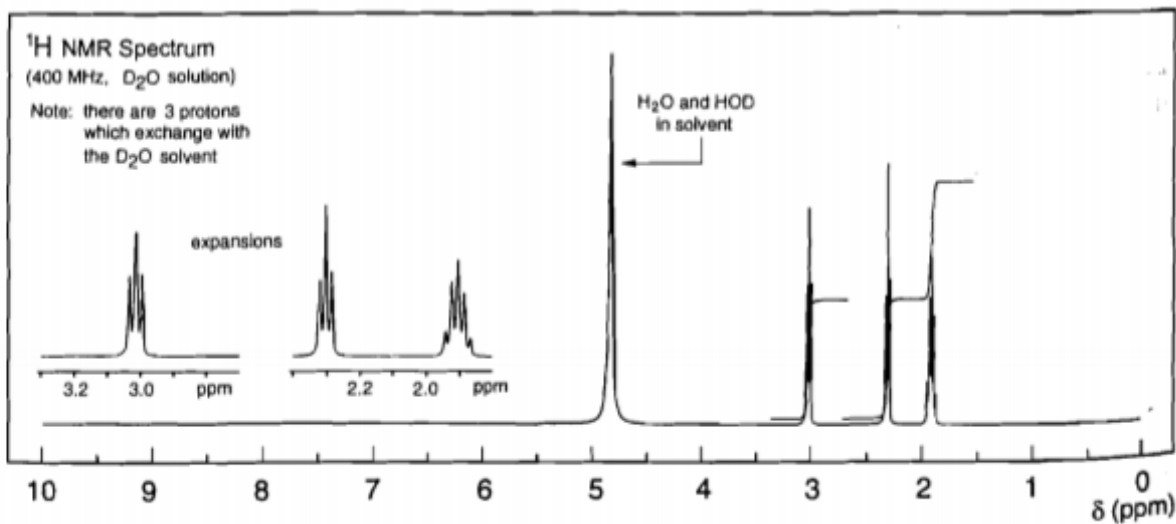
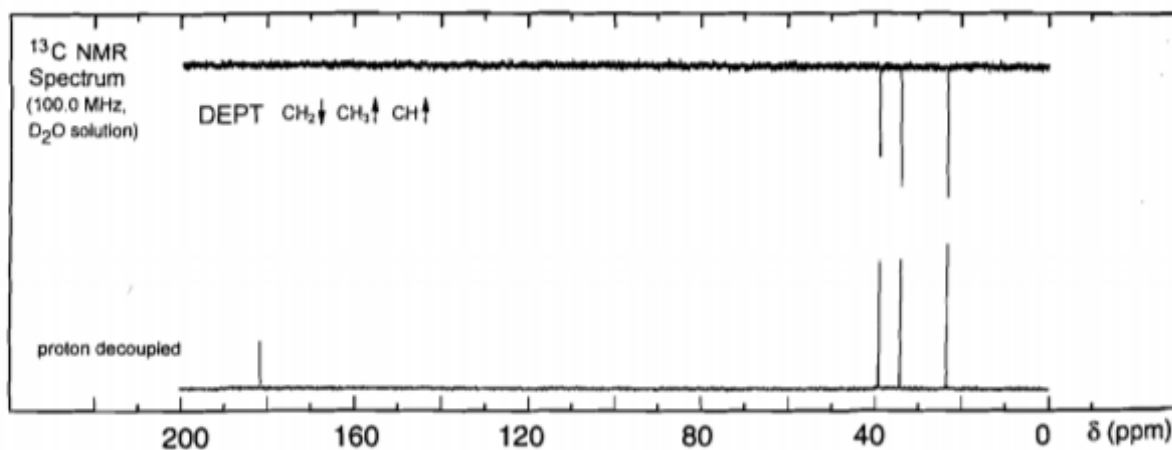
No significant UV  
absorption above 220 nm



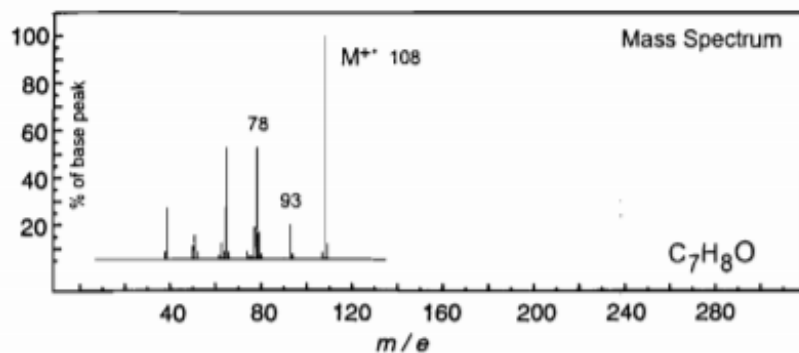
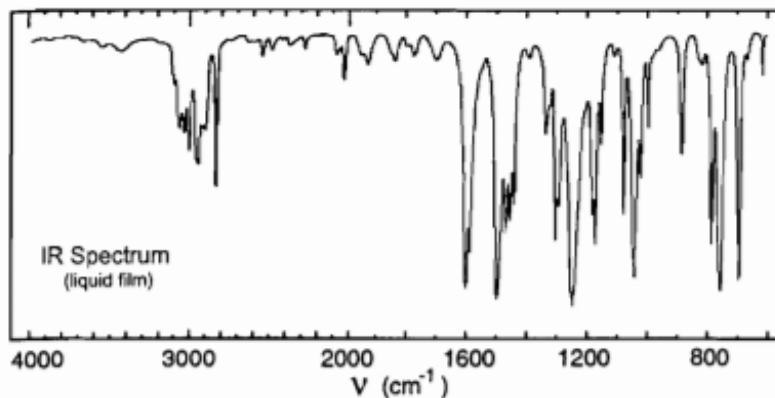
# Problem 21



No significant UV  
absorption above 220 nm



# Problem 22



UV Spectrum

$\lambda_{\text{max}}$  269 nm ( $\log_{10} \epsilon$  3.2)

solvent : methanol

