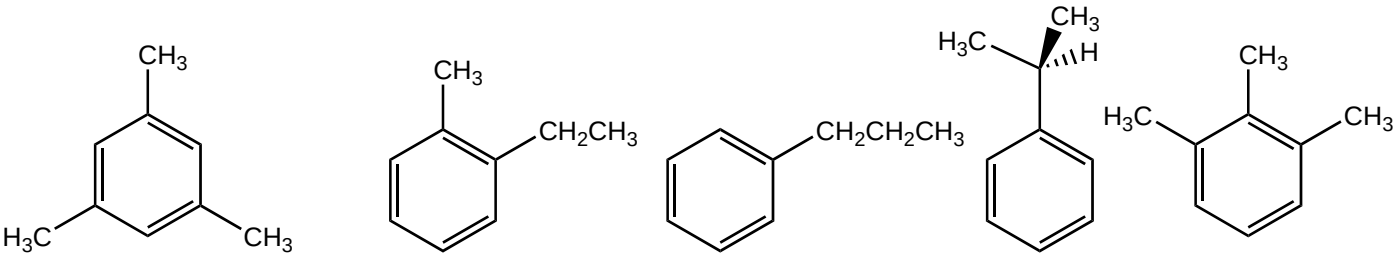
CEM 252
Summer 2006

Quiz 2 - 18 July 2006
20 points

Name_____

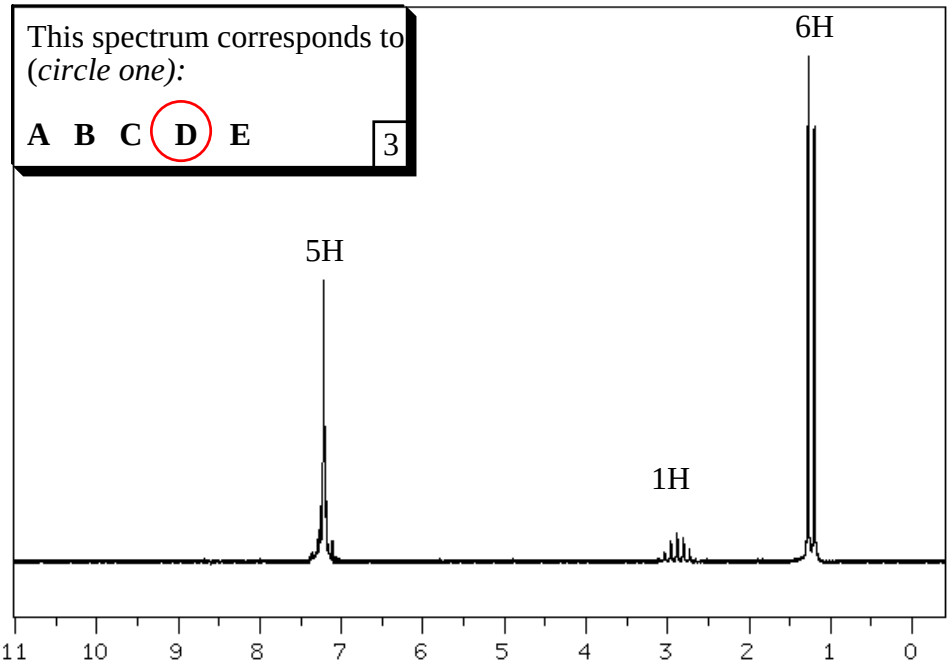
1. Match the following ^{1}H-NMR spectra to the appropriate C_9H_{12} molecule below:



A **B** **C** **D** **E**

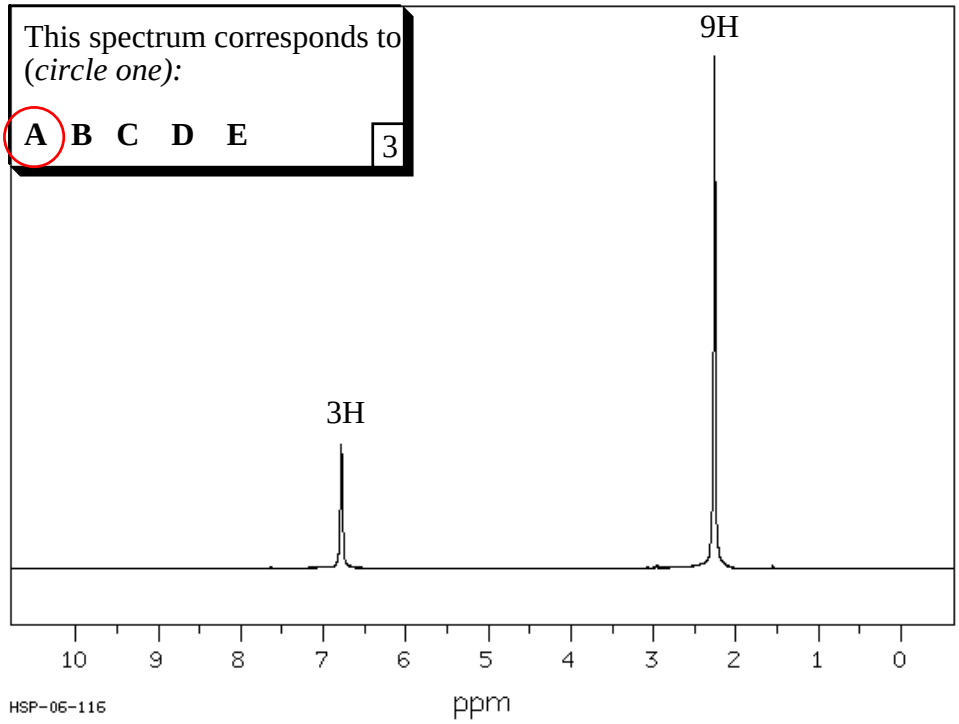
i) This spectrum corresponds to (*circle one):*

A B C (D) E 3



ii) This spectrum corresponds to (*circle one):*

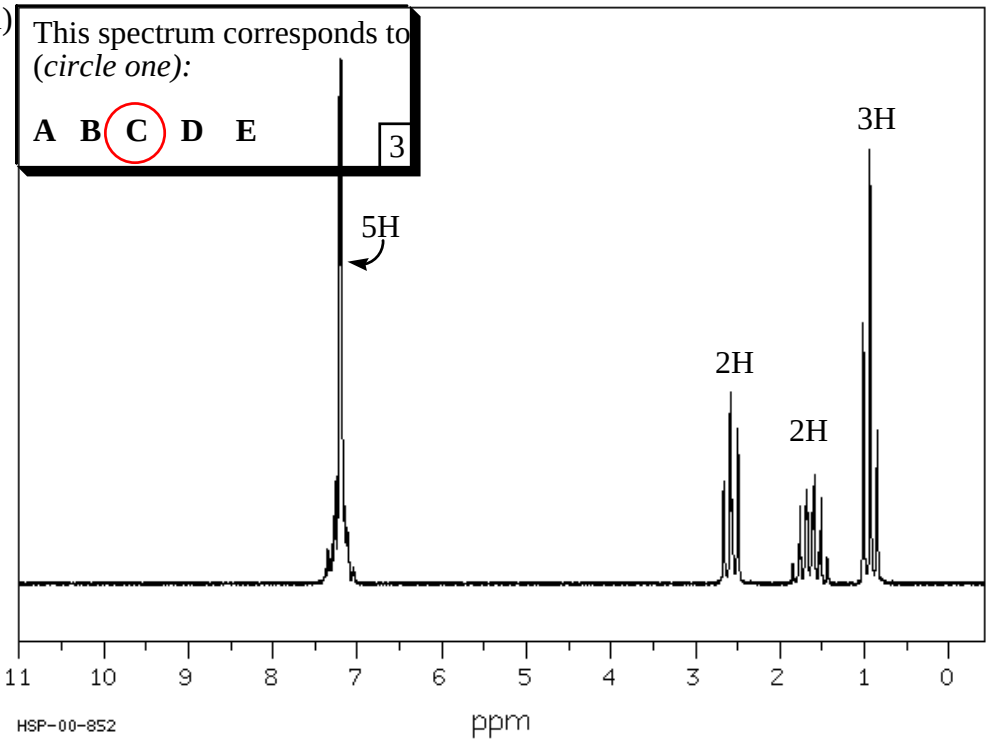
(A) B C D E 3



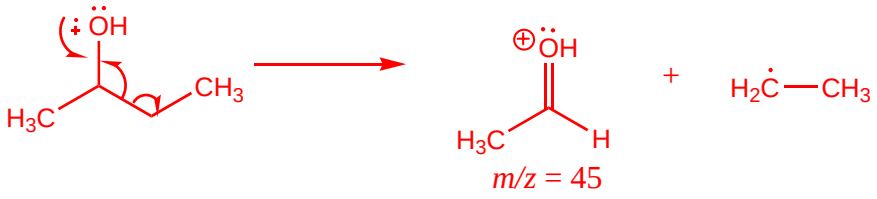
iii) This spectrum corresponds to (*circle one*):

A **B** **C** **D** **E**

3



2. 2-butanol shows the base peak (highest intensity) in its mass spectrum at *m/z* = 45. Draw the molecular ion of 2-butanol ($M^{+\bullet}$) and the fragmentation mechanism that leads to this peak. Use these molecular masses in your calculations: C = 12; O = 16; H = 1.



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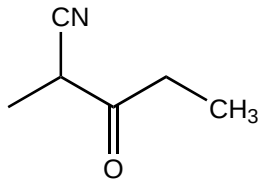
3. Which of the following features would you **not** expect to see in the IR spectrum of the following molecule (*circle one*)?



a strong absorption at 1710 cm^{-1}

a medium absorption at 2250 cm^{-1}

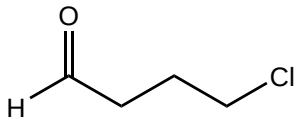
a strong absorption at 2900 cm^{-1}

a strong absorption at 3100 cm^{-1}

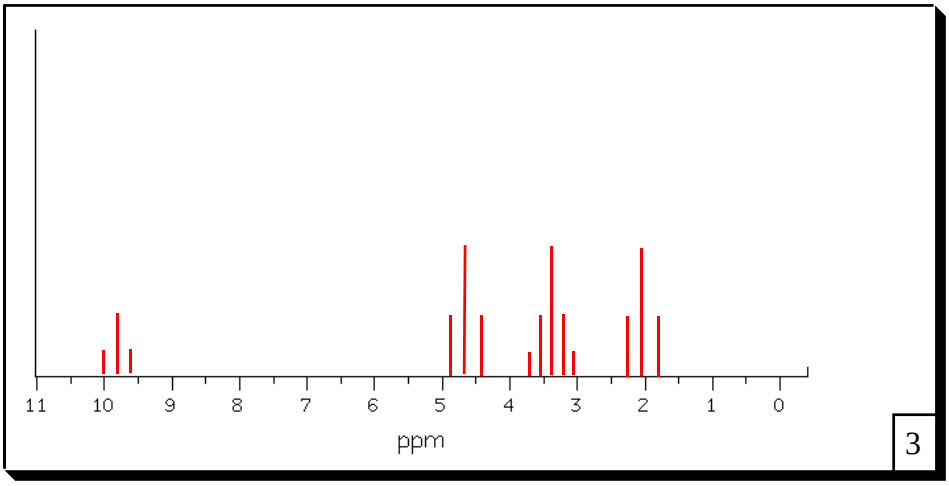
a medium absorption at 1465 cm^{-1}

1

4. Draw an ^{1}H-NMR spectrum for 4-chlorobutanal (shown below). Estimate chemical shifts and draw proper splitting patterns. Draw a multiplet for any splitting > 6.

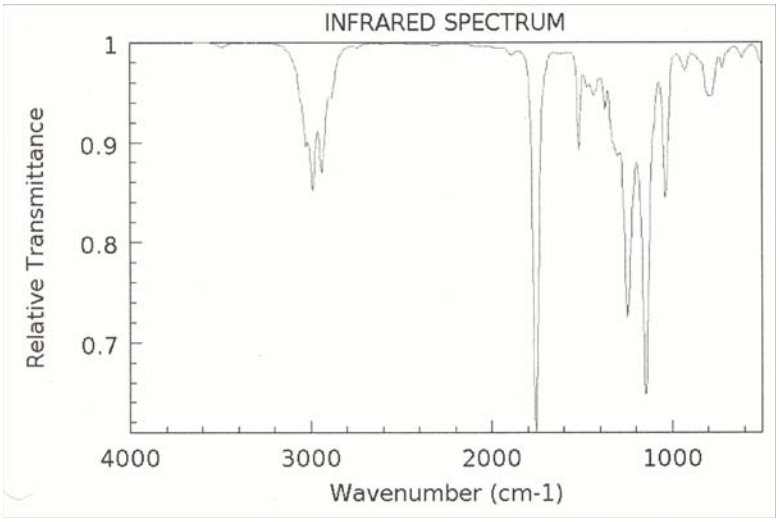


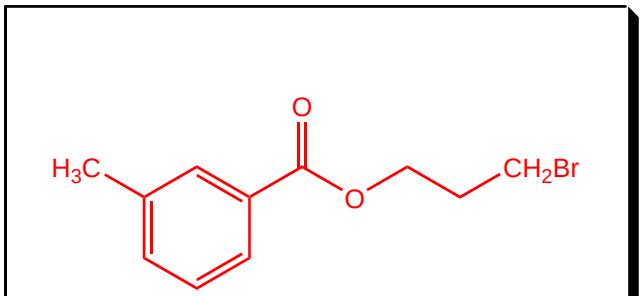
4-chlorobutanal



3

5. Use the following IR and ^{1}H-NMR spectra to deduce the structure of the proper $C_{11}H_{13}BrO_2$ isomer.





structure of $C_{11}H_{13}BrO_2$

4