King Saud University

College of Science

Chemistry Department

Name :

ID :

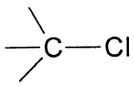
441 Chem – Spectroscopy of Organic Compounds

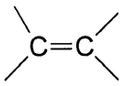
First Med-term Exam – 1st semester 1441

Answer the following questions :

Q_1:

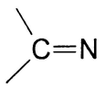
A- Which of the following bonds , would have the highest force constant (K) ?

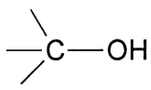




B- Calculate the approximate wave number ($\bar{\nu}$) absorbance of the following bonds

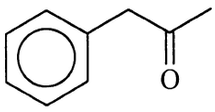
(K for single bond= $5X10^5$dyn/cm)?



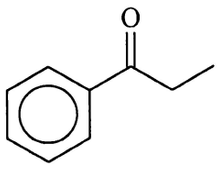


C- The IR spectrum of an unknown compound has a strong absorption band at 1680 cm^{-1}.

Which of the following compounds is consistent with the spectrum. Explain



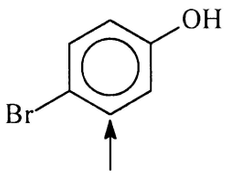
A

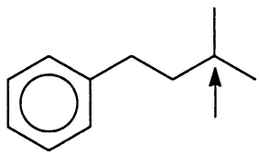


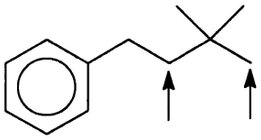
B

Q_2:

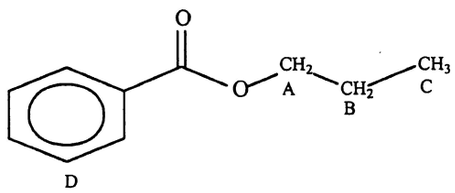
A- Determine the splitting pattern for each type of H indicated in the following molecules:

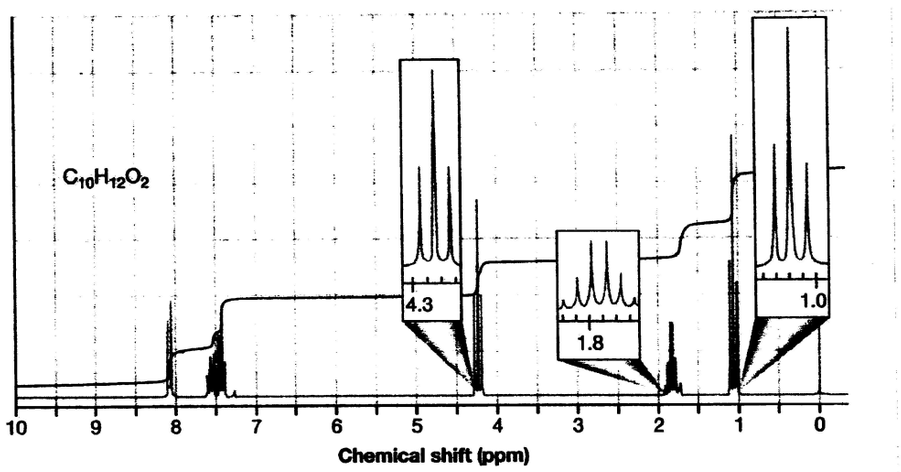






B- Write A , B , C , D above the signals in the following spectrum to match with each H in the following compound :





Q_3: The following IR spectrum is for an unknown compound with the formula $C_3H_6O_2$, deduce a suitable structure for this compound.