Chem 342 • Organic Chemistry II

Answers to additional problems for Chapter 13

Additional Practice Problems:

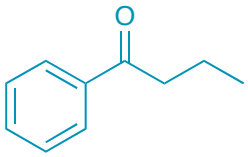
1. How many degrees of unsaturation does a molecule with the formula $C_{11}H_{13}N_2Cl$ have?

   6

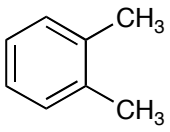
2. Which of the following sets of data would match the proton NMR of ethanol (CH_3CH_2OH)?

   a) 1.2 ppm (triplet, 3H); 2.6 ppm (singlet, 1H); 3.8 ppm (quartet, 2H)
   b) 1.2 ppm (quartet, 3H); 2.6 ppm (singlet, 1H); 3.8 ppm (triplet, 2H)
   c) 1.2 ppm (singlet, 3H); 2.6 ppm (singlet, 1H); 3.8 ppm (singlet, 2H)

3. Use the following ^1H and ^{13}C NMR data to determine the structure of a molecule with the molecular formula $C_{10}H_{12}O$.



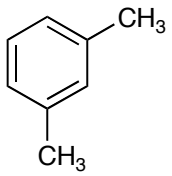
4. The three compounds shown below, ortho-, meta-, and para-xylene have very different ^{13}C NMR spectra. Match the structures with the correct spectra.



ortho-xylene

A

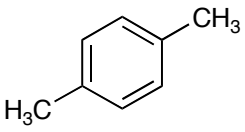
Spectrum 2



meta-xylene

B

Spectrum 3



para-xylene

C

Spectrum 1