Problems from your text

13.5, 13.6, 13.8, 13.16, 13.18, 13.20, 13.17, 13.22, 13.31, 13.32, 13.37, 13.39, 13.40, 13.42, 13.43, 13.46, 13.48, 13.51, 13.53, 13.56

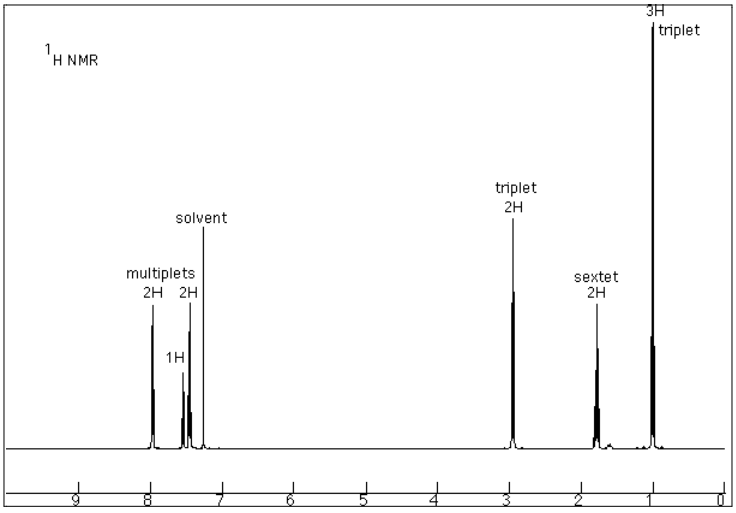
Additional Practice Problems

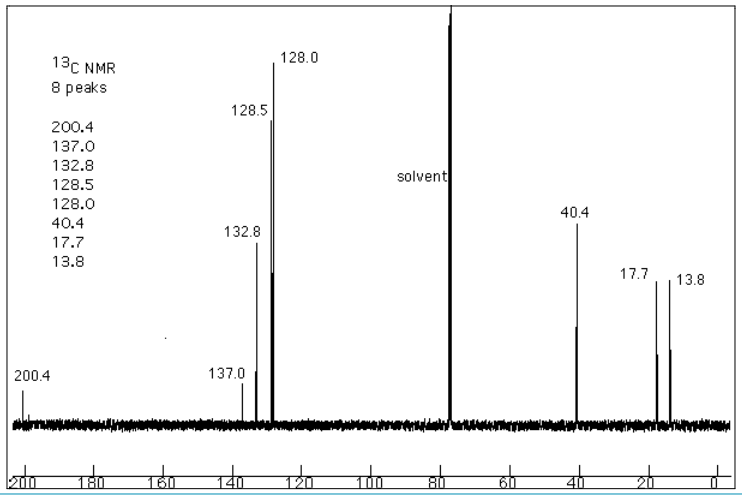
1. How many degrees of unsaturation does a molecule with the formula $C_{11}H_{13}N_2Cl$ have?

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

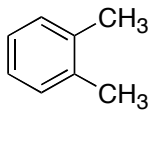
   a) 1.2 ppm (triplet, 3H); 2.6 ppm (singlet, 1H); 3.8 ppm (quartet, 2H)
   b) 1.2 ppm (quartet, 3H); 2.6 ppm (singlet, 1H); 3.8 ppm (triplet, 2H)
   c) 1.2 ppm (singlet, 3H); 2.6 ppm (singlet, 1H); 3.8 ppm (singlet, 2H)

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



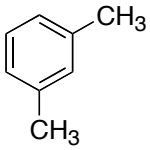


4. The three compounds shown below, ortho-, meta-, and para-xylene have very different ^{13}C NMR spectra. Match the structures with the correct spectra.



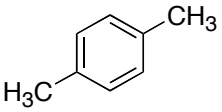
ortho-xylene

A



meta-xylene

B



para-xylene

C