1. Match the following three compounds to their $^{13}$C NMR spectrum. 

- o-dichlorobenzene $\delta\ 127, 129, 131, 135$ ppm
- m-dichlorobenzene $\delta\ 128, 131, 133$ ppm
- p-dichlorobenzene $\delta\ 117, 159$ ppm

2. Assign a constitutional isomer of C$_6$H$_5$O to each $^{13}$C NMR spectrum.
   a. $\delta\ 14, 23, 35$ ppm
   b. $\delta\ 11.7, 22, 31, 32$ ppm
   c. $\delta\ 28, 32$ ppm

3. A and B, isomers of C$_6$H$_5$Cl, have two and four peaks, respectively, in their $^{13}$C NMR spectra. Draw the structures of A and B.

4. An unknown compound (C$_5$H$_7$O) has a strong absorbance in its IR spectrum at 1745 cm$^{-1}$. Its $^{13}$C NMR spectrum has absorbances at $\delta\ 23, 38$ and $220$ ppm. Give the structure of the unknown compound.

5. The following page gives proton NMR spectra for three isomers of C$_6$H$_5$Br. Determine the structure that gave rise to each spectrum.