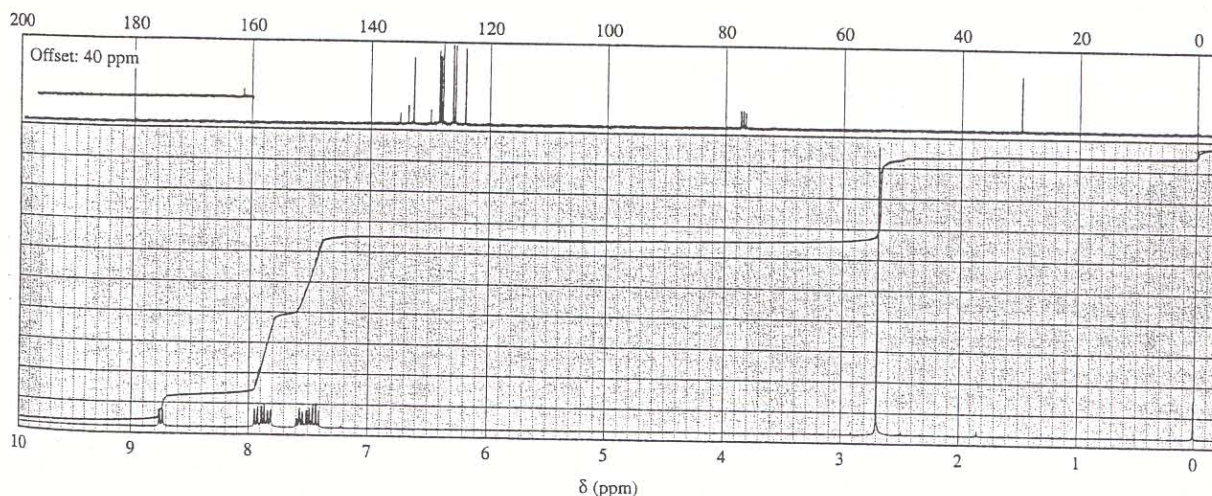
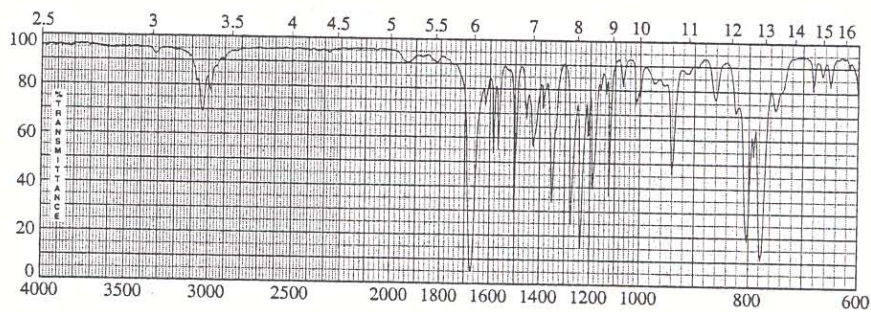
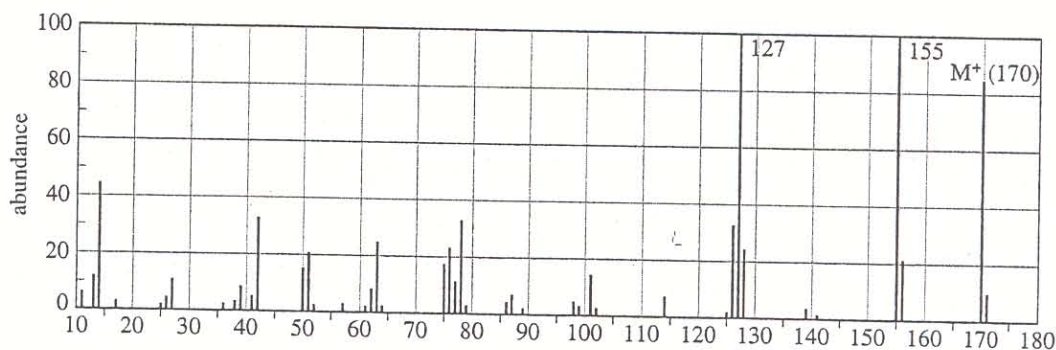


5. Before spectroscopy was invented, a chemical method was used to determine whether a disubstituted benzene derivative was the ortho, meta, or para isomer. A third group, often a nitro group, was added to determine the number of isomers that were formed. For example when ortho xylene was nitrated there were two isomers formed.

a) Draw the structures of these two isomers.

b) A turn of the 20th century chemist isolated an aromatic compound with the molecular formula $C_6H_4Br_2$. He carefully nitrated the compound and purified three isomers of the formula $C_6H_3Br_2NO_2$. Propose structures for the original compound and the three isomers.

6. An unknown compound gives the following mass, IR, and NMR spectra. Propose a structure and show how it is consistent with the spectra. Show fragmentations that give the prominent peaks at m/z 127 and 155 on the mass spectrum.



NMR