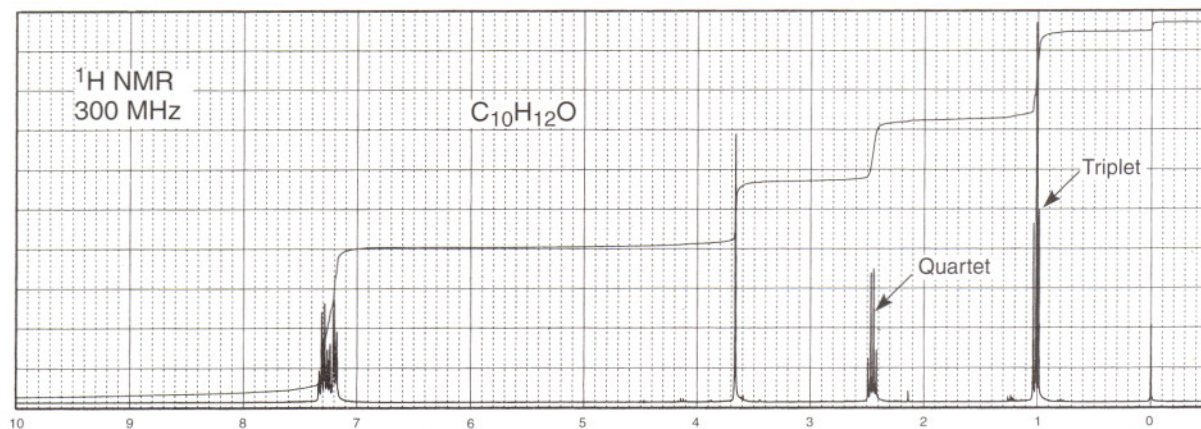
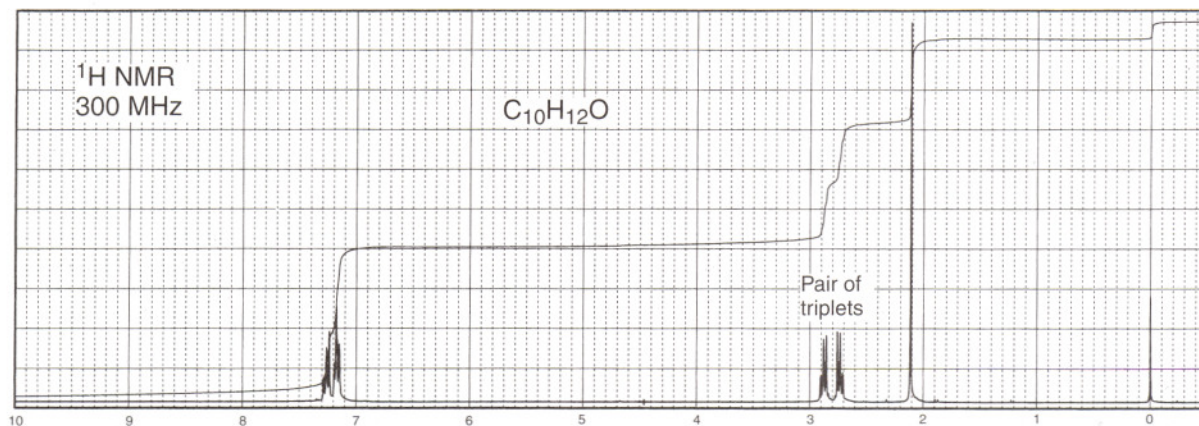


24. The following compounds are isomers with formula $C_{10}H_{12}O$. Their infrared spectra show strong bands near 1715 cm^{-1} and in the range from 1600 to 1450 cm^{-1} . Draw their structures.

(a)

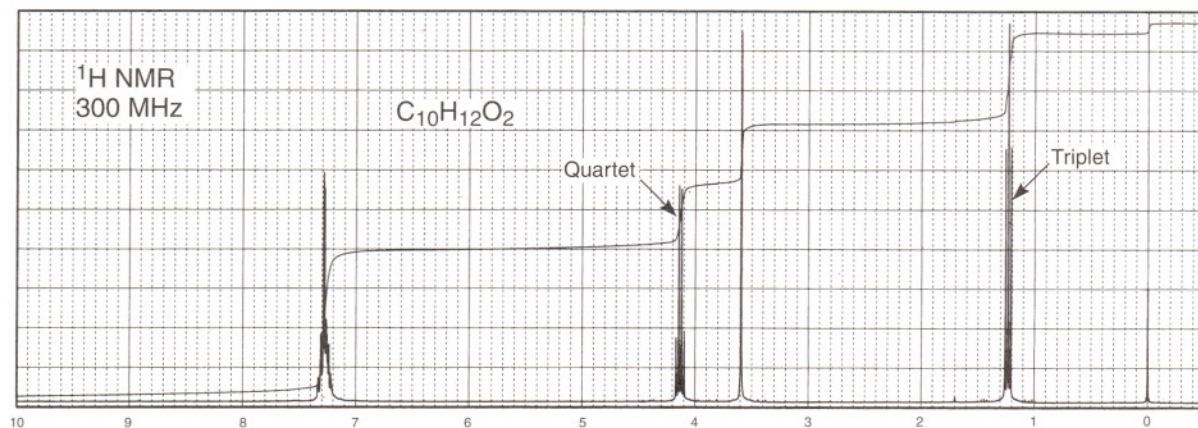


(b)

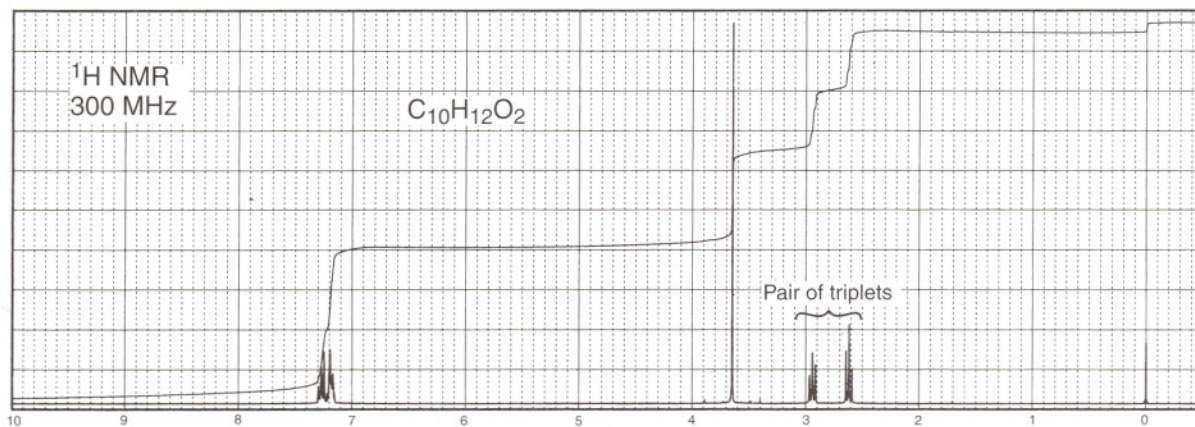


25. The following four NMR spectra are of isomeric monosubstituted aromatic esters with formula $C_{10}H_{12}O_2$. Make no attempt to interpret the aromatic proton areas between 7.1 and 7.4 ppm. Draw the structures of the compounds.

(a)

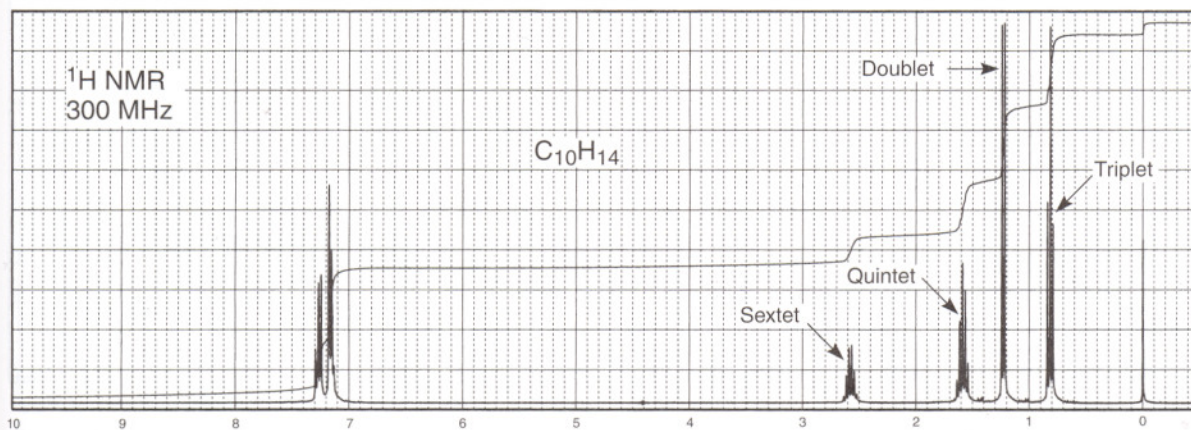


(b)

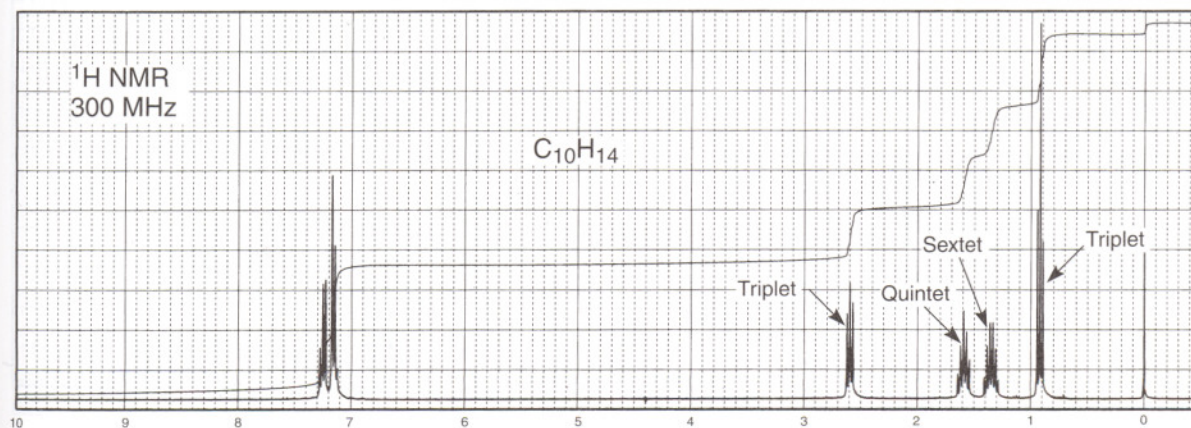


- *22. The following NMR spectra are of monosubstituted aromatic hydrocarbon compounds with the formula $C_{10}H_{14}$. Make no attempt to interpret the aromatic proton area between 7.1 and 7.3 ppm except to determine the relative number of hydrogen atoms. Draw structures for these compounds.

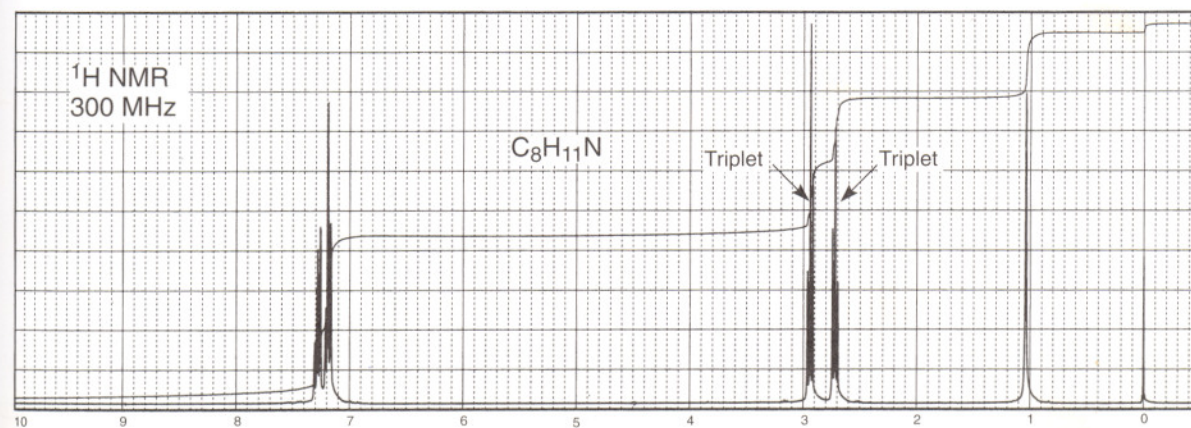
(a)



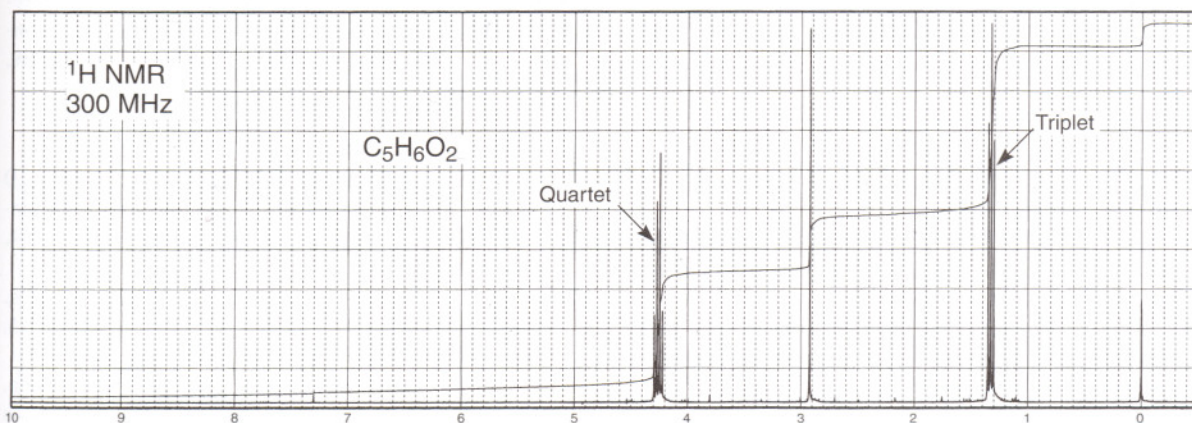
(b)



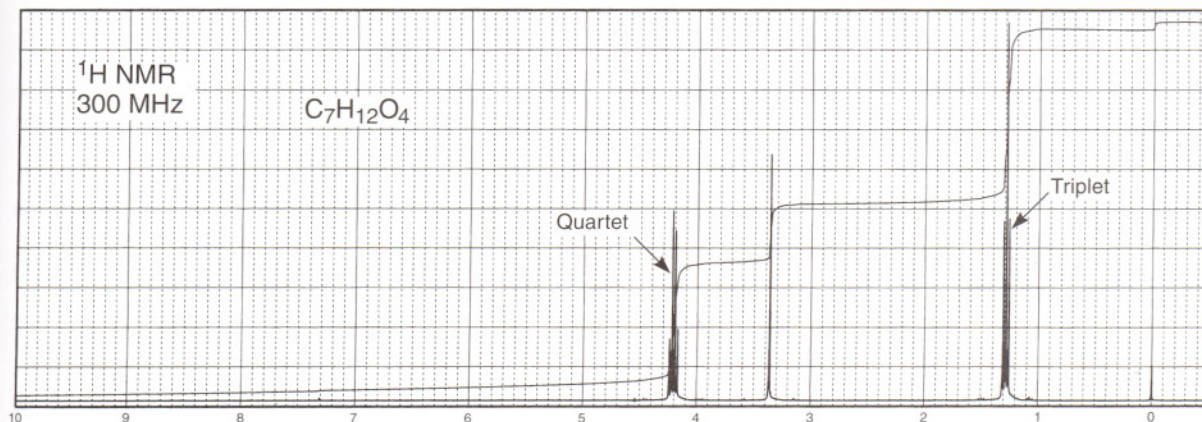
- *23. The following compound, with formula $C_8H_{11}N$, shows a doublet at about 3350 cm^{-1} and bands in the range from 1600 to 1450 cm^{-1} in the infrared spectrum. Draw its structure.



27. The following ester, with formula $C_5H_6O_2$, shows medium bands in the infrared spectrum at 3270 and 2118 cm^{-1} . Draw the structure of the compound.

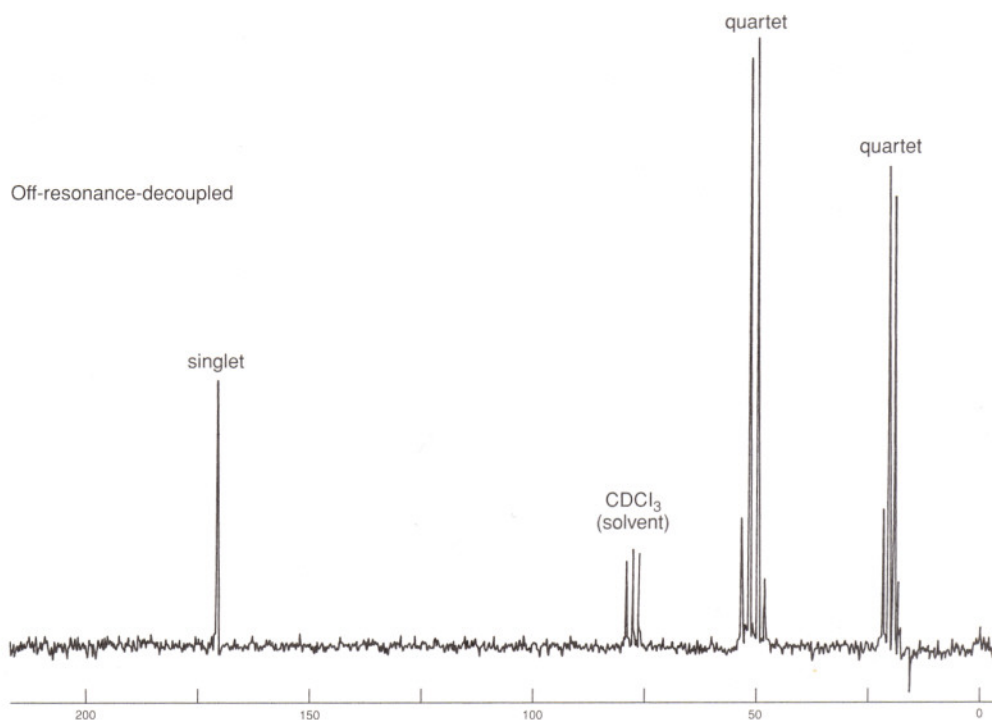
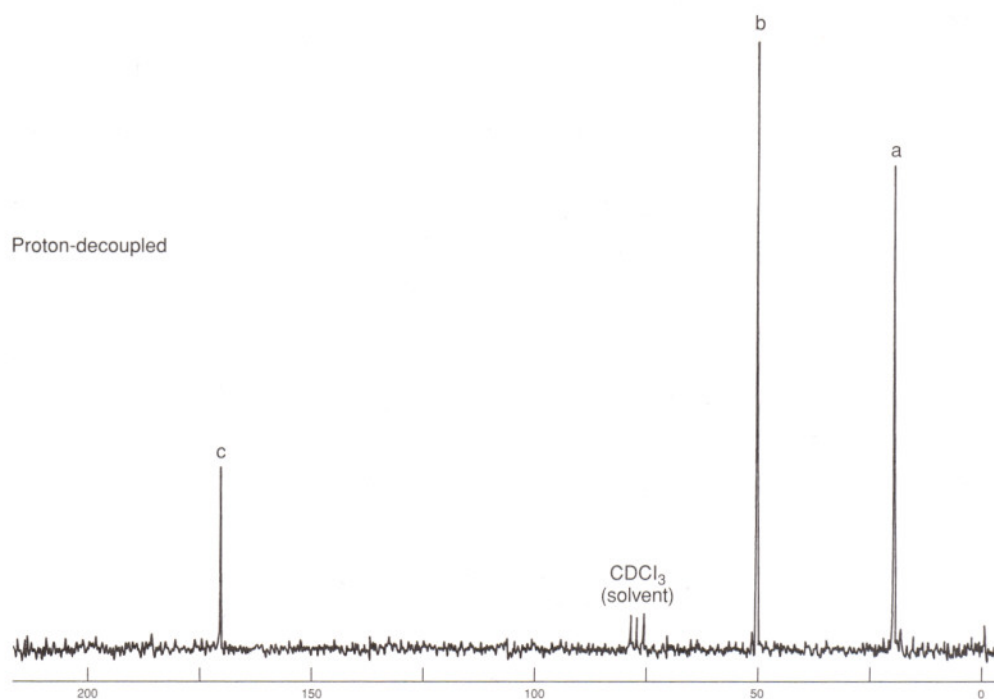


28. The following compound, with formula $C_7H_{12}O_4$, shows strong absorption at 1734 cm^{-1} and has several strong bands centering at about 1200 cm^{-1} in the infrared spectrum. Draw its structure.



PROBLEMS

- *1. A compound with the formula $C_3H_6O_2$ gives the following proton-decoupled and off-resonance-decoupled spectra. Determine the structure of the compound.



- *6. Following are the ^1H and ^{13}C spectra for each of three isomeric ketones with formula $\text{C}_7\text{H}_{14}\text{O}$. Assign a structure to each pair of spectra.

