Year 13 Science: Spectroscopic data: identifying organic compounds

Name: _____ Date: _____

Try these without your notes first, then check the answer key.

Practice

1. A C_3H_8O alcohol has a broad IR dip at 3350 cm^{-1} and two peaks in its ^{13}C NMR spectrum. Name it.

2. How many peaks does pentan-3-one, $CH_3CH_2COCH_2CH_3$, give in its ^{13}C NMR spectrum?

3. A haloalkane has molecular ion peaks at m/z 78 and 80 in a 3 : 1 ratio. Which halogen is present, and what is the molecular formula?

4. An ester $C_4H_8O_2$ has its base peak at m/z 43, a CH_3CO^+ ion. Is it ethyl ethanoate or methyl propanoate?

5. Which IR evidence shows a sample is propanal and not propan-1-ol?

Fix the mistake

6. Correct this statement: "The tallest peak in the mass spectrum is the molecular ion, so M = 43."

7. Correct this statement: "Propan-2-ol has three carbons, so its ^{13}C NMR spectrum has three peaks."

8. Correct this statement: "There is a dip at 3000 cm^{-1}, so the compound has an O–H group."

9. Correct this statement: "A C=O dip at 1715 cm^{-1} means it is a ketone."