



Answers to Topic 9 Exercises

2.11 Exercise 1

1.
 - a) $C_3H_2O_3$, $C_5H_{10}O$, C_6H_{14}
 - b) $C_3H_2O_3$

2.
 - a) O-H (alcohol)
 - b) C=O (carbonyl)
 - c) C=O and O-H (acid) so carboxylic acid
 - d) C=O (carbonyl)

3. All have a carbonyl group (1700)
A is a carboxylic acid (2500 – 3000 broad) – butanoic or methylpropanoic acid.
B has no broad peaks so is either a carbonyl ether or an ester
C is an alcohol (3000 – 3000 broad) so is a carbonyl alcohol

4. The fingerprint region ($1500 - 3500 \text{ cm}^{-1}$) is different for every molecule
So compare the fingerprint region of the molecule with a database of IR spectra of known carbonyl molecules until an exact match is found.

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