

(Carboxylic acids (properties, uses, reactions))

Q1. a). (2020)

This question is about carboxylic acids.

Carboxylic acids belong to a homologous series.

Table 3 shows information about the first three carboxylic acids in this homologous series.

Table 3

Name	Formula	pH of a 0.01 mol/dm ³ solution
Methanoic acid		2.91
Ethanoic acid	CH ₃ COOH	3.39
	CH ₃ CH ₂ COOH	3.44

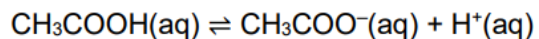
Complete **Table 3**.

[2 marks]

Q1. b). (2020)

Ethanoic acid ionises in water.

The equation for the reaction is:



Explain how the equation shows that ethanoic acid is a weak acid.

[2 marks]

Q1. c). (2020)

A student adds a solution of ethanoic acid to zinc carbonate in an open flask on a balance.

Explain what happens to the mass of the flask and its contents during the reaction.

[3 marks]

Q1. d). (2020)

The student compares the rates of the reaction of zinc carbonate with:

- 0.01 mol/dm³ methanoic acid
- 0.01 mol/dm³ ethanoic acid.

The rate of the reaction with methanoic acid is greater than the rate of the reaction with ethanoic acid.

Explain why.

You should refer to ions in your answer.

Use **Table 3**.

[3 marks]

Q2. (2020)

Ethanoic acid reacts with ethanol to produce an ester.

Give the name of the ester produced when ethanoic acid reacts with ethanol.

[1 mark]

Q3. (2020)

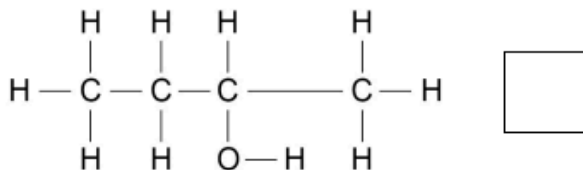
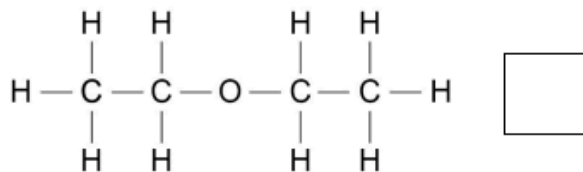
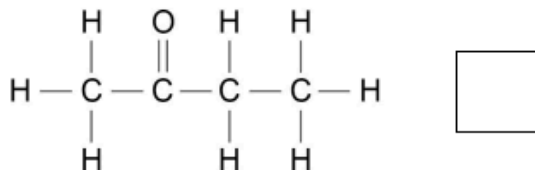
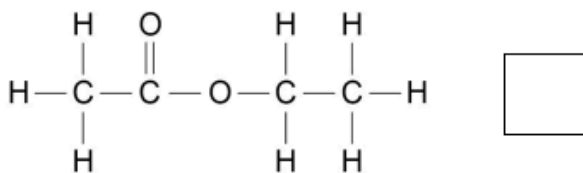
Hexanedioic acid and ethanediol join together to produce a polyester.

Ethanoic acid and ethanol join together in the same way to produce an ester.

Which is the displayed structural formula of the ester produced when ethanoic acid reacts with ethanol?

[1 mark]

Tick (✓) **one** box.



Ethanoic acid can be produced from ethanol.

What is reacted with ethanol to produce ethanoic acid?

[1 mark]

Tick (✓) **one** box.

A halogen

☐

An alkali metal

☐

An oxidising agent

☐

Water

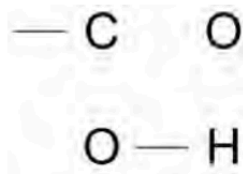
☐

Q5. (2023)

Ethanoic acid contains the functional group -COOH

Complete the displayed structural formula of this functional group.

[1 mark]



Q6. (2023)

Ethanoic acid reacts with different compounds.

Draw **one** line from each compound to a product of the reaction of the compound with ethanoic acid.

[2 marks]

Compound	Product of the reaction with ethanoic acid
	Carbon dioxide
Ethanol	Ethene
	Ethyl ethanoate
Sodium carbonate	Hydrogen
	Poly(ethene)