

GCSE Chemistry

Worksheet: Carboxylic acids

TIME 20 min	TOTAL 20 marks	CALCULATOR Allowed	DIFFICULTY Easy, Medium
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Topics: Carboxylic acids

NAME	CLASS	DATE
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- Use black ink or black ball-point pen. Pencil should only be used for drawing.
- Answer all questions in the spaces provided.
- In all calculations, show clearly how you work out your answer.
- The marks for questions are shown in brackets.

0	1
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0	1	.	1
---	---	---	---

What is the functional group of the carboxylic acids?

.....

.....

.....

.....

[1 mark]

0	1	.	2
---	---	---	---

Name the carboxylic acid with the formula CH_3COOH .

.....

.....

.....

.....

[1 mark]

0 1 . 3

Name the gas produced when a carboxylic acid reacts with a carbonate.

.....

.....

.....

.....

[1 mark]

0 1 . 4

Name the ester produced when ethanol reacts with ethanoic acid.

.....

.....

.....

.....

[1 mark]

0 2

0 2 . 1

Which **two** products form when a carboxylic acid reacts with a reactive metal such as magnesium?

Tick (✓) **two** boxes.

A salt

☐

Hydrogen

☐

Oxygen

☐

Water

☐

Carbon dioxide

☐

[2 marks]

0 3

Ethanoic acid is a carboxylic acid.

0 3 . 1

A student added ethanoic acid to sodium carbonate.

Give **one** observation.

.....

.....

[1 mark]

0 3 . 2

Name the salt formed in this reaction.

.....

.....

.....

.....

[1 mark]

0 3 . 3

Describe a test for the gas produced and give the result.

.....

.....

.....

.....

[2 marks]

0 3 . 4

Ethanoic acid reacts with ethanol to produce an ester.

Name the catalyst used and the other product of the reaction.

.....

.....

.....

.....

[2 marks]

0 4

0 4 . 1

Draw the displayed formula of propanoic acid, $\text{CH}_3\text{CH}_2\text{COOH}$.

.....

.....

.....

.....

[2 marks]

0 4 . 2

Which of these is a carboxylic acid?

Tick (✓) **one** box.

HCOOH

☐

$\text{CH}_3\text{CH}_2\text{OH}$

☐

$\text{CH}_3\text{COOCH}_2\text{CH}_3$

☐

C_2H_4

☐

[1 mark]

0 4 . 3

Name the carboxylic acid HCOOH .

.....

.....

.....

[1 mark]

0 4 . 4

Give the formula of butanoic acid.

.....

.....

[1 mark]

0 5

Vinegar is a dilute solution of ethanoic acid. A student adds vinegar to a spoonful of solid sodium hydrogencarbonate (baking soda) in a plastic bottle and quickly seals it with a balloon over the opening.

0 5 . 1

Write a word equation for the reaction between ethanoic acid and sodium hydrogencarbonate.

.....

.....

[1 mark]

0 5 . 2

Explain why the balloon inflates.

.....

.....

.....

.....

[2 marks]

END OF QUESTIONS

Original practice questions written to match the specification. Not produced by, affiliated with or endorsed by AQA.

Mark scheme

GCSE Chemistry · Worksheet: Carboxylic acids · 20 marks

Question 1 (4 marks)

01.1 [1 mark]

Answer: -COOH

- -COOH (1)
-

01.2 [1 mark]

Answer: Ethanoic acid

- ethanoic acid (1)
-

01.3 [1 mark]

Answer: Carbon dioxide

- carbon dioxide (1)
-

01.4 [1 mark]

Answer: Ethyl ethanoate

- ethyl ethanoate (1)
-

Question 2 (2 marks)

02.1 [2 marks]

Correct: A salt; Hydrogen

Question 3 (6 marks)

03.1 [1 mark]

Answer: Fizzing (bubbles).

- fizzing / bubbles / the solid disappears (1)

03.2 [1 mark]

Answer: Sodium ethanoate

- sodium ethanoate (1)

03.3 [2 marks]

Answer: Bubble the gas through limewater: it turns milky.

- bubble the gas through limewater (1)
- the limewater turns milky / cloudy (1)

03.4 [2 marks]

Answer: An acid catalyst (concentrated sulfuric acid); water.

- (concentrated) sulfuric acid / an acid catalyst (1)
- water (1)

Question 4 (5 marks)

04.1 [2 marks]

Answer: A chain of three carbon atoms with five hydrogen atoms on the first two carbons and a COOH group shown as C=O and C–O–H.

- three carbon atoms in a chain, with all bonds shown and five H atoms on the first two carbon atoms (1)
- the –COOH group drawn with a C=O bond and a C–O–H (1)

04.2 [1 mark]

Correct: HCOOH

04.3 [1 mark]

Answer: Methanoic acid

- methanoic acid (1)

04.4 [1 mark]

Answer: C₃H₇COOH

- C₃H₇COOH / CH₃CH₂CH₂COOH (1)
-

Question 5 (3 marks)

05.1 [1 mark]

Answer: ethanoic acid + sodium hydrogencarbonate $\rightarrow$ sodium ethanoate + water + carbon dioxide

- ethanoic acid + sodium hydrogencarbonate $\rightarrow$ sodium ethanoate + water + carbon dioxide (1)

Notes: All three products are needed for the mark. Allow the products in any order.

05.2 [2 marks]

Answer: Carbon dioxide gas is produced by the reaction and, since the bottle is sealed by the balloon, the gas collects inside the balloon, inflating it.

- carbon dioxide gas is produced by the reaction (1)
 - the gas cannot escape (the bottle is sealed by the balloon), so it collects in the balloon, inflating it (1)
-