Carboxylic Acids Esters

GCSE Chemistry · Written to the shared content for AQA, Edexcel and OCR

Name _____ Class _____ Date _____

1. Worked example

Name the products when ethanoic acid reacts with sodium carbonate, and describe what you would see. (3 marks)

Step 1 · Products

Sodium ethanoate, water and carbon dioxide.

Step 2 · Observation

Fizzing (effervescence) dioxide is given off; the solid carbonate disappears.

Step 3 · Equation

$2CH_3COOH + Na_2CO_3 \rightarrow 2CH_3COONa + H_2O + CO_2$

Answer: Sodium ethanoate, water and carbon dioxide; fizzing

Check: Carboxylic acids react with carbonates like other acids.

2. Now try one with the steps

Name the ester made from ethanol and ethanoic acid, and state the conditions. (2 marks)

Step 1 · Name

Step 2 · Conditions

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. Give the functional group of the carboxylic acids. [1]

2. Name the carboxylic acid with formula CH_3COOH. [1]

3. Write the formula of methanoic acid. [1]

4. Calculate the relative formula mass of ethanoic acid, CH_3COOH. (C = 12, H = 1, O = 16) [1]

5. Name the three products of the reaction between ethanoic acid and sodium carbonate. [3]

6. Name the ester formed from ethanol and ethanoic acid. [1]

7. State the catalyst used to make an ester. [1]

8. Calculate the relative formula mass of ethyl ethanoate, $CH_3COOC_2H_5$. (C = 12, H = 1, O = 16) [1]

9. Give one property and two uses of esters. [3]

10. Write a word equation for propanoic acid reacting with calcium carbonate. [2]

11. Name the alcohol and carboxylic acid needed to make methyl propanoate. [2]

12. Write the equation showing the partial ionisation of ethanoic acid in water. [1]

13. Explain why ethanoic acid is described weak acid. [1]

14. Calculate the maximum mass, in g, of ethyl ethanoate made from 6.0 g of ethanoic acid and excess ethanol. (M_r: ethanoic acid 60, ethyl ethanoate 88) [3]

4. Before you hand it in

Naming esters with the acid part first
Ethanol + ethanoic acid → ETHYL ETHANOATE (alcohol → '-yl', acid → '-oate').

"Ethanoic acid is weak because it is dilute."
Weak = partially ionised; dilute = low concentration.

Counting –COOH extra carbon chain
Ethanoic acid has 2 carbons in total: CH_3–COOH.