

33.2 Esters

Name: _____ Class: _____ Date: _____

Total: 10 marks

KEY WORDS acyl chloride 酰氯 • ester 酯 • phenol 苯酚 • benzoic acid 苯甲酸 • alcohol 醇

Objective

Build the skills to answer exam questions on **esters** 酯 — how they are made from an acyl chloride, naming them, and recognising the ester link.

You must be able to:

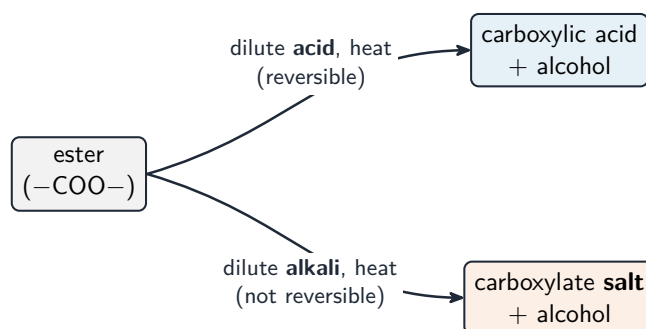
- make an ester from an alcohol (or phenol) and an acyl chloride
- name an ester from its structure (and vice versa)
- write equations for ester formation

1 Worked examples

■ Making and naming esters



Alcohol (or phenol) + acyl chloride → ester + HCl, at room temperature



Esters are hydrolysed back to acid and alcohol

- **alcohol/phenol + acyl chloride → ester + HCl.**
- e.g. ethanol + ethanoyl chloride → ethyl ethanoate; phenol + benzoyl chloride → phenyl benzoate.

- **naming:** the alcohol part gives the first word (“ethyl”), the acid part gives the second (“...anoate”).

2 Practice

2.1 Name the ester $\text{CH}_3\text{COOCH}_2\text{CH}_3$. [1]

2.2 Name the two organic starting materials (an acyl chloride + an alcohol) for ethyl ethanoate. [2]

3 Exam-style questions

3.1 The ester HCOOCH_3 is named: [1]

- **A** methyl methanoate
- **B** methyl ethanoate
- **C** ethyl methanoate
- **D** methanoyl methane

3.2 Phenyl benzoate is made from benzoyl chloride and: [1]

- **A** benzene
- **B** phenol
- **C** benzoic acid
- **D** phenylamine

3.3 Methanol reacts with ethanoyl chloride.

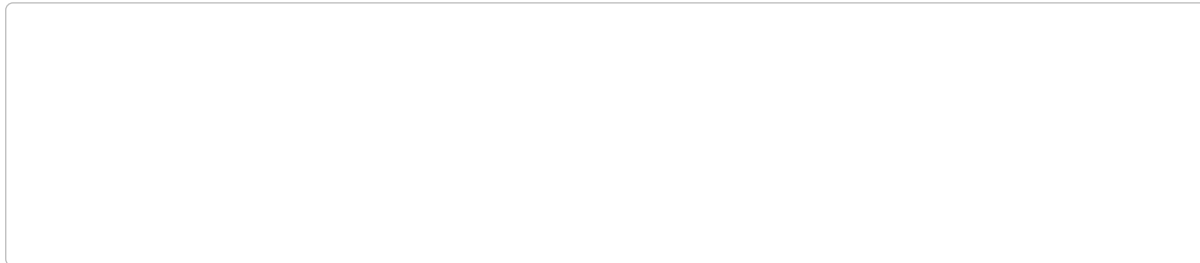
(a) Write the equation. [2]

(b) Name the ester formed.

[1]

3.4 Draw the structure of propyl methanoate and circle the **ester link**.

[2]



Solutions

2.1 ethyl ethanoate.

2.2 ethanoyl chloride; ethanol.

3.1 A. HCOO^- is methanoate; $-\text{CH}_3$ is methyl $\rightarrow$ methyl methanoate.

3.2 B. Phenol + benzoyl chloride $\rightarrow$ phenyl benzoate + HCl .

3.3 (a) $\text{CH}_3\text{COCl} + \text{CH}_3\text{OH} \rightarrow \text{CH}_3\text{COOCH}_3 + \text{HCl}$.

(b) methyl ethanoate.

3.4 $\text{HCOOCH}_2\text{CH}_2\text{CH}_3$ drawn out; the $-\text{COO}-$ ester link circled.