

32.1 Alcohols (esters from acyl chlorides)

Name: _____ Class: _____ Date: _____

Total: 9 marks

KEY WORDS ester 酯 • acyl chloride 酰氯 • alcohol 醇

Objective

Build the skills to answer exam questions on the **A2 reaction of alcohols** 醇 — making an **ester** 酯 from an alcohol and an **acyl chloride** 酰氯.

You must be able to:

- give the product of an alcohol with an acyl chloride
- compare this route with esterification using a carboxylic acid
- write the equation and name the products

1 Worked examples

■ Ester from an acyl chloride



An acyl chloride reacts with an alcohol faster and more completely than a carboxylic acid does, giving the ester + HCl fumes



the **-OH** (acid) and **-H** (alcohol) leave as **water**; the **C-O-C** ester link forms
(concentrated H₂SO₄ catalyst; reversible)

Esters from acyl chlorides and alcohols

- **alcohol + acyl chloride → ester + HCl**, at room temperature.
- e.g. ethanol + ethanoyl chloride → ethyl ethanoate + HCl.
- this is **faster and more complete** than using a carboxylic acid (which is reversible and needs an acid catalyst + heat).

2 Practice

2.1 Name the ester formed from ethanol and ethanoyl chloride. [1]

2.2 Name the other product (the fumes) given off. [1]

3 Exam-style questions

3.1 Compared with using ethanoic acid, making an ester from ethanoyl chloride is: [1]

A	B
C	D

- A slower and reversible
- B faster and more complete
- C only possible with a catalyst
- D impossible at room temperature

3.2 Which product is given off as fumes when an alcohol reacts with an acyl chloride? [1]

A	B
C	D

- A H₂
- B CO₂
- C HCl
- D H₂O

3.3 Propan-1-ol reacts with propanoyl chloride.

(a) Write the equation for the reaction. [2]

(b) Name the ester produced. [1]

3.4 Explain why an acyl chloride is preferred over a carboxylic acid for making an ester in the lab. [2]
