

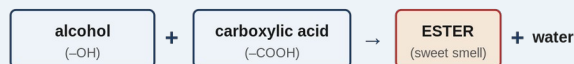
4.7 Esters

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1. KEY VOCABULARY

TERM	MEANING
Ester	A sweet-smelling organic compound made from an alcohol and a carboxylic acid.
Esterification	The reaction that makes an ester.
Catalyst	Concentrated sulfuric acid is used as the catalyst.
Reversible	Esterification can go both ways (\rightleftharpoons).
Volatile	Easily turned into a vapour — why esters can be smelt.

2. MAKING AN ESTER



Warmed together with an acid catalyst (concentrated sulfuric acid).

Esters are used in perfumes and food flavourings — they smell sweet/fruity.

The reaction is reversible.

3. THE REACTION

alcohol + carboxylic acid \rightleftharpoons ester + water

Example: ethanol + ethanoic acid \rightleftharpoons ethyl ethanoate + water.

Warmed gently with a concentrated sulfuric acid catalyst.

4. NAMING ESTERS

First part comes from the alcohol (e.g. ethanol \rightarrow ethyl).

Second part comes from the acid (e.g. ethanoic acid \rightarrow ethanoate).

So ethanol + ethanoic acid \rightarrow ethyl ethanoate.

5. PROPERTIES & USES

Esters have a sweet, fruity smell and are volatile.

Uses: perfumes, food flavourings and as solvents.

6. THE WHY

Why concentrated sulfuric acid is used: it is a catalyst — it speeds the reaction up without being used up.

Why you can smell esters: they are volatile, so molecules easily evaporate and reach your nose.

7. COMMON EXAM MISTAKES

- ✗ "An ester is made from two alcohols."
- ✓ An ester is made from an alcohol AND a carboxylic acid.
- ✗ "Sulfuric acid is a reactant in esterification."
- ✓ It is the catalyst — not used up.
- ✗ "Only the ester is made."
- ✓ Water is also made (ester + water).

8. SELF-CHECK · cover & quiz

Can you...

1. State what two things react to make an ester?
2. Write the general word equation for esterification?
3. Name the catalyst used?
4. Name the ester from ethanol + ethanoic acid?
5. Describe the properties and uses of esters?
6. Explain why a catalyst is used?