16 Alcohols – Part 1

Name: _____ Class: _____ Date: _____

Vocabulary 词汇

Write each word three times. 把每个单词抄写三遍。

English	中文	Write it 3 times (English)		
ethanol	乙醇			
alcohol	醇			
primary	伯			
secondary	仲			
tertiary	叔			
dehydration	脱水			
carboxylic acid	羧酸			
ester	酯			
oxidation	氧化			

Recall

At IGCSE you met **ethanol** 乙醇, the alcohol in drinks and fuel. An **alcohol** 醇 has the **–OH** (hydroxyl) functional group.

- The –OH group gives the family its reactions.
- Like halogenoalkanes, alcohols come in three classes.

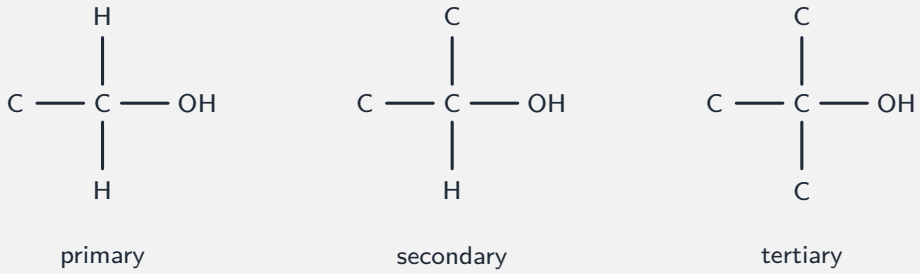
Nothing here is harder than IGCSE —it just adds the reactions.

New ideas

Read these first, then do the Practice.

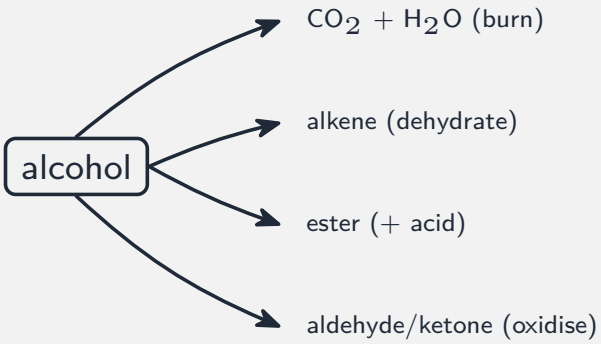
1 Three classes

An alcohol is **primary** 伯, **secondary** 仲 or **tertiary** 叔, set by how many carbons are joined to the carbon holding the **–OH**.



2 Reactions of alcohols

- **combustion** —burn in oxygen → CO + water.
- **with sodium** —react with sodium metal → hydrogen + a sodium alkoxide.
- **dehydration** 脱水—hot Al O (or conc. acid) removes water → an **alkene**.
- **esterification** —with a **carboxylic acid** 羧酸 (conc. H SO catalyst) → an **ester** 酯.
- **oxidation** 氧化—with acidified K Cr O (Part 2).



Watch out: an alcohol's class (primary/secondary/tertiary) is set by the number of carbons on the C–OH carbon —exactly like halogenoalkanes —and it controls the product of oxidation (Part 2).

Practice

Try these in order.

16.1 Name the functional group of an alcohol. [1]

16.2 What decides whether an alcohol is primary, secondary or tertiary? [1]

16.3 Name the products when an alcohol reacts with sodium metal. [2]

16.4 What is formed when an alcohol is dehydrated? [1]

16.5 An alcohol reacts with a carboxylic acid (with a sulfuric acid catalyst). Name the product. [1]

16.6 Write the products of the complete combustion of ethanol. [1]

16.7 Challenge. Propan-1-ol and propan-2-ol share the formula C_3H_8O. Classify each as primary or secondary, and explain. [2]