A-LEVEL CHEMISTRY • HOLIDAY HOMEWORK 假期作业

16 Alcohols – Part 2

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)		
potassium dichromate(VI)	重铬酸钾			
aldehyde	醛			
carboxylic acid	羧酸			
ketone	酮			
distillation	蒸馏			
reflux	回流			

Recall

From Part 1 you know the three classes of alcohol. Here we **oxidise** them — and the product tells you which class you have.

- The class decides what oxidation gives.
- The apparatus (distillation or reflux) controls how far it goes.

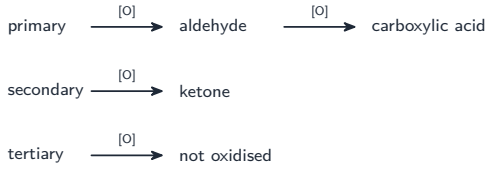
New ideas

Read these first, then do the Practice.

1 Oxidation by class

Oxidise with acidified **potassium dichromate(VI)** 重铬酸钾 ($K_2Cr_2O_7$):

Class	Product
primary	an **aldehyde** 醛 (by distillation), then a **carboxylic acid** 羧酸 (by reflux)
secondary	a **ketone** 酮
tertiary	**not oxidised**



A quick test: acidified dichromate turns **orange to green** with a primary or secondary alcohol, but **stays orange** with a tertiary alcohol.

2 Distillation vs reflux

- **distillation** 蒸馏 removes the aldehyde **as it forms**, before it can be oxidised further → stops at the aldehyde.
- **reflux** 回流 keeps boiling and returning the vapour, so the alcohol is **fully** oxidised → the carboxylic acid.

Watch out: distillation *stops* at the aldehyde (it is removed as it forms); reflux goes *all the way* to the carboxylic acid. A tertiary alcohol is not oxidised at all, so the dichromate stays orange.

Practice

Try these in order.

16.1 Name the reagent used to oxidise an alcohol. [1]

16.2 State the oxidation product of (a) a secondary alcohol, (b) a tertiary alcohol. [2]

16.3 A primary alcohol can be oxidised to two different products. Name them and the method for each. [2]

16.4 What colour change does acidified dichromate show with a primary alcohol? [1]

16.5 Explain why distillation stops the oxidation at the aldehyde. [2]

16.6 Challenge. An unknown alcohol is warmed with acidified dichromate, and the orange colour does *not* change. Identify the class of the alcohol and explain. [2]