33 Making carboxylic acids – 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)
carboxylic acid	羧酸	
alkylbenzene	烷基苯	
benzoic acid	苯甲酸	
acyl chloride	酰氯	

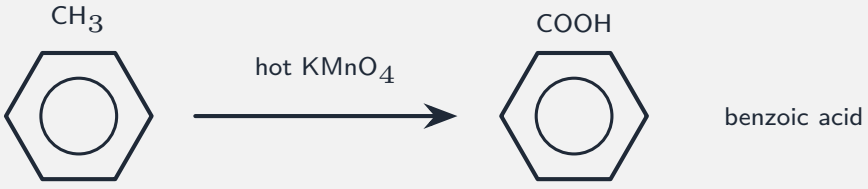
Recall

A **carboxylic acid** 羧酸 has the –COOH group. You can make one, and turn it into an acyl chloride.

New ideas

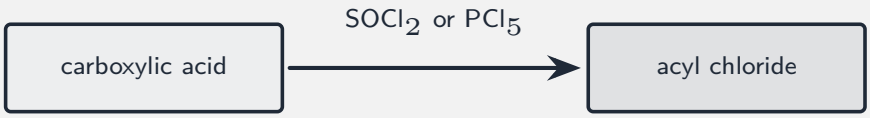
Read these first, then do the Practice.

1 Making benzoic acid



An **alkylbenzene** 烷基苯 (such as methylbenzene) is oxidised by hot alkaline $KMnO_4$ —the whole side-chain becomes –COOH, giving **benzoic acid** 苯甲酸.

2 Making an acyl chloride



A carboxylic acid reacts with $SOCl_2$ or PCl_5 to form an **acyl chloride** 酰氯.

Watch out: hot $KMnO_4$ oxidises the *whole* alkyl side-chain to a single –COOH, whatever its length —so both methylbenzene and ethylbenzene give benzoic acid.

Practice

Try these in order.

33.1 What functional group does a *carboxylic acid* have? [1]

33.2 What reagent oxidises a methyl side-chain to –COOH? [1]

33.3 What product does oxidising methylbenzene give? [1]

33.4 Name one reagent that turns a carboxylic acid into an *acyl chloride*. [1]

33.5 What happens to the whole side-chain in the oxidation? [1]

33.6 Challenge. Both methylbenzene and ethylbenzene are oxidised by hot alkaline $KMnO_4$. Predict the product of each, and explain. [2]