

33 Making carboxylic acids – Part 1

Name: _____ Class: _____ Date: _____

Vocabulary

Write each word three times.

English

Write it 3 times (English)

carboxylic acid

alkylbenzene

benzoic acid

acyl chloride

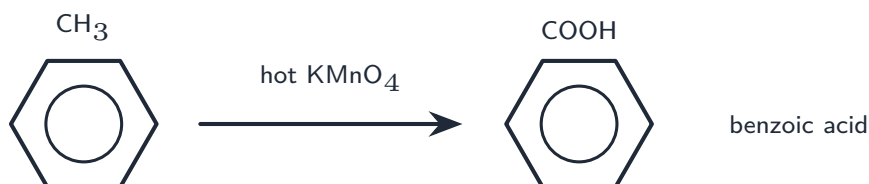
Recall

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

New ideas

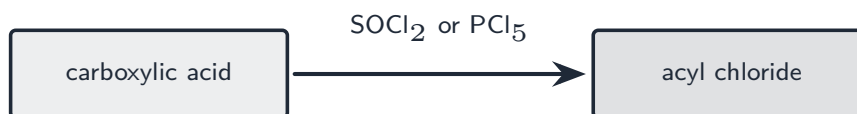
Read these first, then do the Practice.

■ 1 Making benzoic acid



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

■ 2 Making an acyl chloride



A carboxylic acid reacts with SOCl₂ or PCl₅ to form an **acyl chloride** .

Watch out: hot KMnO₄ 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 KMnO₄. Predict the product of each, and explain. [2]