

33. Carboxylic acids and derivatives

Starter Quiz · 课前小测

A-Level Chemistry

Name: _____ Score: _____

1. Oxidising methylbenzene with hot alkaline KMnO_4 gives:

- ☐ benzoic acid (the side-chain becomes $-\text{COOH}$)
- ☐ nitrobenzene
- ☐ cyclohexane
- ☐ phenol

2. An ester can be made at room temperature by reacting an acyl chloride with:

- ☐ an alcohol or a phenol
- ☐ an alkane
- ☐ water only
- ☐ an amine

3. An acyl chloride reacting with ammonia gives:

- ☐ an amide (plus HCl)
- ☐ an ester
- ☐ a carboxylic acid
- ☐ an alkene

4. Which carboxylic acid can be oxidised further?

- ☐ methanoic acid (HCOOH)
- ☐ ethanoic acid
- ☐ propanoic acid
- ☐ benzoic acid

5. Reacting phenol with benzoyl chloride gives:

- ☐ phenyl benzoate
- ☐ ethyl ethanoate
- ☐ benzoic acid
- ☐ phenol again

6. Making an ester from an acyl chloride happens at room temperature.

- ☐ True
- ☐ False

7. An ester is hydrolysed by hot aqueous alkali in a reaction called _____.

- ☐ True
- ☐ False

8. Carboxylic acids react with carbonates to release carbon dioxide.

- ☐ True
- ☐ False

9. Esters often have sweet, fruity smells.

10. Acyl chlorides react vigorously with water to give a carboxylic acid and _____ chloride gas.

1. **benzoic acid (the side-chain becomes –COOH)**

The whole side-chain is oxidised to a –COOH group, giving benzoic acid.

2. **an alcohol or a phenol**

Both alcohols and phenols react with acyl chlorides to give esters (+ HCl).

3. **an amide (plus HCl)**

Ammonia (or a 1°/2° amine) reacts with an acyl chloride to give an amide.

4. **methanoic acid (HCOOH)**

Methanoic and ethanedioic acids can be oxidised further (e.g. to CO₂); most carboxylic acids cannot.

5. **phenyl benzoate**

A phenol + an acyl (benzoyl) chloride forms the ester phenyl benzoate.

6. **True**

Acyl chlorides are very reactive, so the reaction proceeds quickly at room temperature.

7. **saponification**

It gives a carboxylate salt and an alcohol.

8. **True**

A test for the acid group.

9. **True**

They are used as flavourings and perfumes.

10. **hydrogen**

Misty fumes of HCl form.