

A-Level Chemistry

Name: _____ Score: _____

1. An alcohol reacting with an acyl chloride gives:
 - ☐ a halogenoalkane
 - ☐ an ester (plus HCl)
 - ☐ an alkene
 - ☐ an amine
2. Phenol is:
 - ☐ an –OH on a long alkyl chain
 - ☐ an –OH group joined directly to a benzene ring
 - ☐ a halogenoarene
 - ☐ a carboxylic acid
3. Compared with using a carboxylic acid, making an ester from an acyl chloride is:
 - ☐ slower
 - ☐ faster and more complete
 - ☐ reversible and incomplete
 - ☐ impossible
4. Unlike an ordinary alcohol, phenol reacts with NaOH(aq). This shows phenol is:
 - ☐ unreactive
 - ☐ less acidic
 - ☐ a base
 - ☐ more acidic than an alcohol
5. Ethanol + ethanoyl chloride gives:
 - ☐ ethene
 - ☐ ethanoic acid
 - ☐ ethyl ethanoate
 - ☐ ethanal
6. Phenol is a weak acid that reacts with sodium hydroxide.
 - ☐ True ☐ False

7. An acyl chloride reacts with an alcohol to form an _____.

8. Carboxylic acids are more reactive than acyl chlorides.

☐ True ☐ False

9. Phenol with bromine water at room temperature (no catalyst) gives:

☐ a brown solution

☐ no reaction

☐ bromobenzene only

☐ 2,4,6-tribromophenol (a white precipitate)

10. The acidity order is:

☐ water < ethanol < phenol

☐ phenol < water < ethanol

☐ ethanol < water < phenol

☐ all equal

A-Level Chemistry

1. **an ester (plus HCl)**

The alcohol's -OH reacts with the acyl chloride to form an ester, releasing HCl .

2. **an -OH group joined directly to a benzene ring**

The -OH is bonded straight to the aromatic ring, changing both the -OH and the ring chemistry.

3. **faster and more complete**

Acyl chlorides are very reactive, so esterification with them is fast and goes essentially to completion.

4. **more acidic than an alcohol**

Phenol is acidic enough to react with NaOH , forming sodium phenoxide; alcohols are not.

5. **ethyl ethanoate**

The ester ethyl ethanoate forms, along with HCl fumes.

6. **True**

The -OH on the ring is more acidic than in an alcohol.

7. **ester**

Releasing hydrogen chloride gas.

8. **False**

False. Acyl chlorides are more reactive than carboxylic acids, because chloride is a good leaving group and the carbonyl carbon is strongly $\delta+$.

9. **2,4,6-tribromophenol (a white precipitate)**

The activated ring reacts readily, brominating positions 2, 4 and 6 to give a white precipitate.

10. **ethanol < water < phenol**

Phenol is the most acidic of the three because the phenoxide charge is delocalised into the ring.