

A-Level Chemistry

Name: _____ Score: _____

1. A purple colour with neutral iron(III) chloride identifies a:
 - ☐ carboxylic acid
 - ☐ phenol
 - ☐ halogenoalkane
 - ☐ ketone
2. A compound that reacts violently with cold water, giving fumes of HCl, is a:
 - ☐ alkane
 - ☐ phenol
 - ☐ acyl chloride
 - ☐ amine
3. Phenylamine reacting with HNO_2 below 10°C gives:
 - ☐ a diazonium salt
 - ☐ an azo dye
 - ☐ nitrobenzene
 - ☐ phenol
4. The best way to plan a multi-step synthesis is to:
 - ☐ ignore the functional groups
 - ☐ guess
 - ☐ work only forwards
 - ☐ work backwards from the target
5. Planning an organic synthesis means choosing a sequence of reactions to convert a starting material into a target molecule.
 - ☐ True ☐ False
6. Ethanoyl chloride reacts with excess ammonia to form the amide _____.

7. Replacing a halogen with $-\text{CN}$ adds one carbon to the organic molecule.
 - ☐ True ☐ False
8. Which reagent reduces an amide to an amine?
 - ☐ Neutral FeCl_3
 - ☐ LiAlH_4
 - ☐ Bromine water

A-Level Chemistry

1. **phenol**

Neutral FeCl_3 gives a purple colour with phenols.

2. **acyl chloride**

Acyl chlorides hydrolyse vigorously with water, releasing HCl .

3. **a diazonium salt**

Cold HNO_2 forms a diazonium salt, which can then make phenol or couple to an azo dye.

4. **work backwards from the target**

Working backwards finds which reaction makes the target, and from what, step by step.

5. **True**

Few steps and good yields are preferred.

6. **ethanamide**

The acyl group stays as $\text{CH}_3\text{CO}-$ and $-\text{NH}_2$ replaces $-\text{Cl}$, giving CH_3CONH_2 .

7. **True**

The carbon in the cyanide group joins the carbon skeleton; count it when planning the product.

8. **LiAlH_4**

LiAlH_4 is the reducing agent on the reaction map. FeCl_3 and bromine water are identification tests.