

36. Organic synthesis

Starter Quiz · 课前小测

A-Level Chemistry

Name: _____ Score: _____

- A purple colour with neutral iron(III) chloride identifies a:
 - ☐ phenol
 - ☐ carboxylic acid
 - ☐ halogenoalkane
 - ☐ ketone
- A compound that reacts violently with cold water, giving fumes of HCl, is a:
 - ☐ acyl chloride
 - ☐ phenol
 - ☐ alkane
 - ☐ amine
- Phenylamine reacting with HNO₂ below 10 °C gives:
 - ☐ a diazonium salt
 - ☐ phenol
 - ☐ an azo dye
 - ☐ nitrobenzene
- The best way to plan a multi-step synthesis is to:
 - ☐ work backwards from the target
 - ☐ work only forwards
 - ☐ guess
 - ☐ ignore the functional groups
- Planning an organic synthesis means choosing a sequence of reactions to convert a starting material into a target molecule.
 - ☐ True ☐ False
- Ethanoyl chloride reacts with excess ammonia to form the amide _____.

- Replacing a halogen with –CN adds one carbon to the organic molecule.
 - ☐ True ☐ False
- Which reagent reduces an amide to an amine?
 - ☐ LiAlH₄
 - ☐ Neutral FeCl₃
 - ☐ Bromine water

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Answers · 答案

A-Level Chemistry

- phenol**

Neutral FeCl₃ gives a purple colour with phenols.
- acyl chloride**

Acyl chlorides hydrolyse vigorously with water, releasing HCl.
- a diazonium salt**

Cold HNO₂ forms a diazonium salt, which can then make phenol or couple to an azo dye.
- work backwards from the target**

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

Few steps and good yields are preferred.
- ethanamide**

The acyl group stays as CH₃CO– and –NH₂ replaces –Cl, giving CH₃CONH₂.
- True**

The carbon in the cyanide group joins the carbon skeleton; count it when planning the product.
- LiAlH₄**

LiAlH₄ is the reducing agent on the reaction map. FeCl₃ and bromine water are identification tests.