

# OCR Chemistry A-Level

## Practical skills assessed in the practical endorsement

### Flashcards

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How do you use laboratory equipment to carry out a titration?



# How do you use laboratory equipment to carry out a titration?

- A pipette is used to accurately measure out the volume of a reactant before transferring it to a conical flask.
- A burette is a measured, controlled and easy way to add small volumes of one reactant to another reactant.



How do you use laboratory equipment to heat under reflux?



# How do you use laboratory equipment to heat under reflux?

Quickfit apparatus is used to heat a substance under reflux.

- The substance is boiled in a pear-shaped or round-bottomed flask.
- As it evaporates, it is cooled by the water in the liebig condenser and so condenses back into a liquid and drips back down into the flask to be heated again.



# Why is heating under reflux used?



## Why is heating under reflux used?

- Allows heating for a long period of time
- Prevents the flask from boiling dry
- Prevents volatile reactants/products escaping
- Ensures even heating

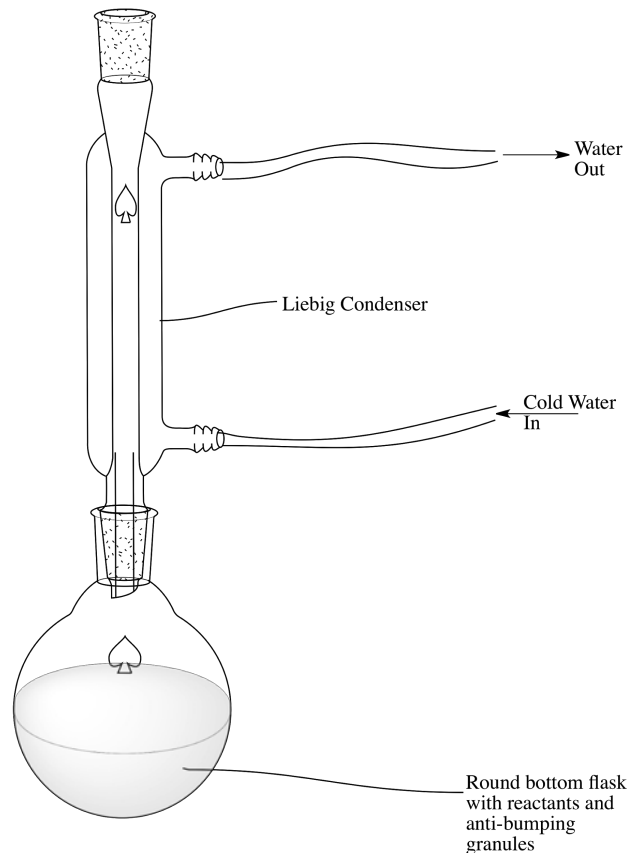


What does a diagram of Quickfit apparatus set up for heating under reflux look like?





What does a diagram of Quickfit apparatus set up for heating under reflux look like?



How do you use laboratory equipment to carry out distillation?



# How do you use laboratory equipment to carry out distillation?

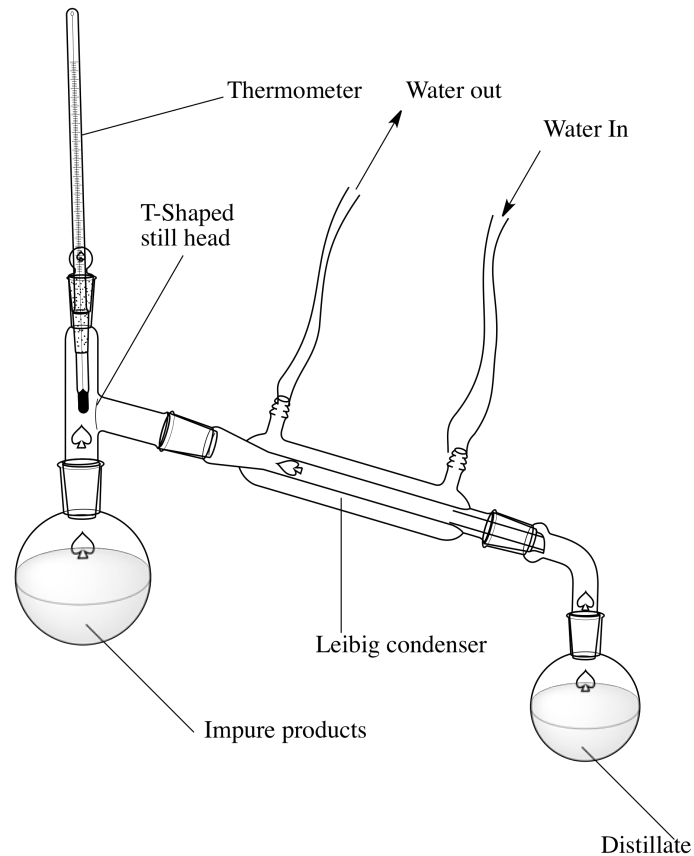
- The substance you want to distill is heated in a pear-shaped or round-bottomed flask, causing it to evaporate.
- When it reaches the condenser it will cool and condense back into a liquid which will then drip out into the collecting flask.



What does a diagram of Quickfit apparatus set up for distillation look like?



What does a diagram of Quickfit apparatus set up for distillation look like?



How do you use laboratory equipment to filter under reduced pressure?



# How do you use laboratory equipment to filter under reduced pressure?

Using a Buchner funnel and Buchner flask, connected by rubber tubing to the vacuum source.

- The funnel contains a layer of filter paper.
- Pour the substance onto the filter paper and the liquid will be sucked through via vacuum filtration into the flask.
- The solid will remain on the paper.

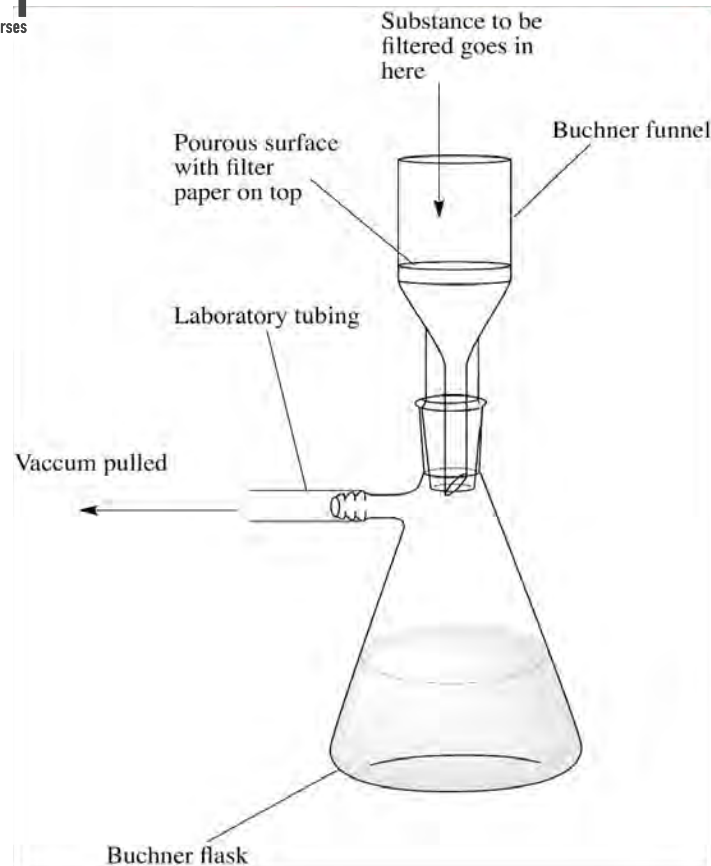


What does a diagram of filtration under reduced pressure look like?





What does a diagram of filtration under reduced pressure look like?



# What is a standard solution?



# What is a standard solution?

A standard solution is a solution of known concentration.



# How do you make a standard solution?



## How do you make a standard solution?

- Measure, using a balance, the mass of solid required.
- Transfer this to a volumetric flask and rinse the remaining weighing bottle content into the flask so no solid is lost.
- Add a volume of distilled water to dissolve the solid. Swirl to mix.
- Then add more distilled water up to the line on the neck of the volumetric flask. Invert multiple times to mix.



When doing a titration, what are concordant results?



When doing a titration, what are concordant results?

Titres that are within  $0.1 \text{ cm}^3$  of each other.



# Why are acid-base indicators used?





# Why are acid-base indicators used?

To detect when a reaction reaches completion/becomes neutral, usually by the presence of a colour change.



# How do you purify a solid product?



# How do you purify a solid product?

By recrystallisation.

- Add minimum amount of warm solvent to the impure sample until it has dissolved.
- Allow to cool, crystals should form.
- When no more form you can filter under reduced pressure to obtain a dry crystalline solid.



# How do you purify a liquid product?



## How do you purify a liquid product?

- You can use a separating funnel to isolate the organic layer from the aqueous layer.
- You can then purify the liquid by distillation, which separates the substances by boiling point.



How do you determine the melting point of a substance and why can this information be useful?



## How do you determine the melting point of a substance and why can this information be useful?

- Place a small sample of the solid in a capillary tube.
- Melt using the melting apparatus available, measuring the temperature with a thermometer.
- A pure substance will usually melt at a single temperature (or a very small range) but an impure substance will melt over a range of temperatures (usually lower than that of the pure substance).
- Record the starting and ending points of the melting, when the first crystal can be seen to melt and when the last crystal becomes liquid respectively.
- You can then compare the melting point to known values to identify the substance.



What are the uses of thin layer or paper chromatography?





What are the uses of thin layer or paper chromatography?

To separate a mixture into its constituent components for analysis. This allows identification by the calculation and comparison of  $R_f$  values.



How do you calculate an  $R_f$  value?



How do you calculate an  $R_f$  value?

$R_f$  value = Distance travelled by  
component  $\div$  Distance travelled by  
solvent



# How do you set up an electrochemical cell?



## How do you set up an electrochemical cell?

- Two half cells are set up and connected to each other via a salt bridge (which allows the flow of ions).
- Each electrode is then connected to a voltmeter which will measure the cell potential.



# How can rate of reaction be measured?



## How can rate of reaction be measured?

- Initial rates method- i.e. the iodine clock reaction
- A continuous monitoring method- i.e. measuring the volume of gas released in a reaction over time.



# What is the weighing by difference method?





## What is the weighing by difference method?

- It is a method to weigh materials accurately.
- $\text{Mass of substance} = \text{Mass of weighing dish and substance} - \text{Mass of dish after substance has been transferred.}$



Why may an experimental value for enthalpy change be different to the actual value?



Why may an experimental value for enthalpy change be different to the actual value?

1. Heat loss to apparatus/surroundings.
2. Incomplete combustion.
3. Non-standard conditions.
4. Evaporation of alcohol/water.



# What is heating to constant mass?



# What is heating to constant mass?

The repeated heating and weighing of a substance until the mass no longer changes.



How do you measure the volume of gas given off from a reaction?



# How do you measure the volume of gas given off from a reaction?

- Using a gas syringe.
- The plunger is pushed out of the syringe as more and more gas is collected.
- You can read the volume of gas from the scale along the side of the syringe.



What are some common potential hazards and risks in the laboratory?





# What are some common potential hazards and risks in the laboratory?

Hazard	Risk	Control
Bunsen burner	Burns.	Keep away from flammable chemicals and away from the edge of the desk.
Chemicals	<ul style="list-style-type: none"><li>- May be an irritant or corrosive, causing irritation to skin, eyes, lungs.</li><li>- May be toxic</li><li>- May be Flammable.</li></ul>	Handle with care and while wearing gloves. Wear eye protection. Keep away from the edge of the desk and from an open flame. Don't ingest.
Glassware i.e beakers, test tubes.	May break and cut you.	Handle with care. Keep away from edge of the desk.



# How can pH be measured?



# How can pH be measured?

## Using :

- pH charts
- A pH meter,
- A pH probe with a data logger



How can we keep a substance at a constant temperature?



How can we keep a substance at a constant temperature?

By using a water bath. This allows us to control temperature and keep it constant.

