Edexcel Chemistry A-Level

Core practical 16 - Synthesis of aspirin

Flashcards

What are the main steps in producing a pure organic solid?

What are the main steps in producing a pure organic solid?

1. Synthesis of the compound (usually using reflux, distillation etc.)
2. Filtration (usually vacuum filtration)
3. Purification (recrystallisation)

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.

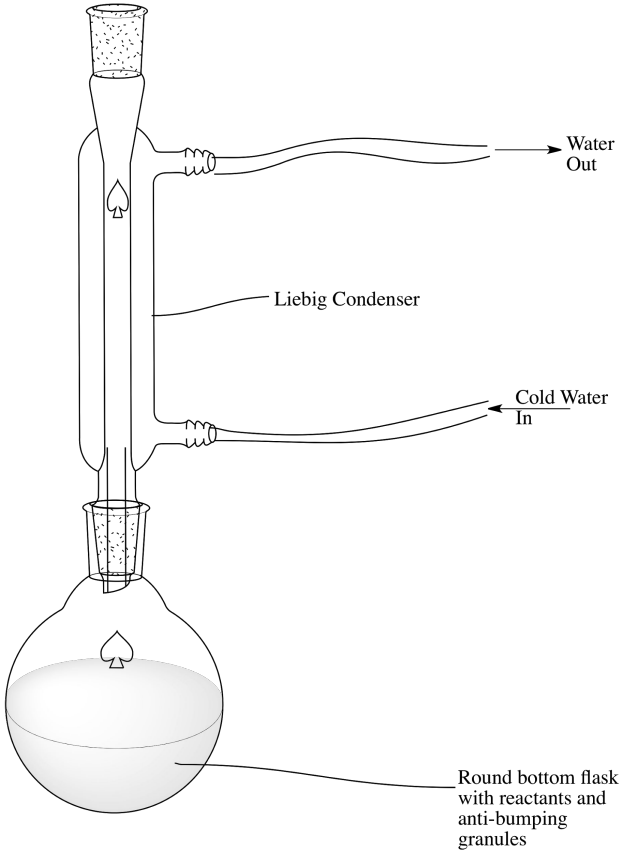
Why is heating under reflux used?

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?



Why are anti-bumping granules used when heating under reflux and distillation?

Why are anti-bumping granules used when heating under reflux and distillation?

To allow smooth boiling- preventing bubbles (caused by vapour) in the hot liquid from bubbling up the sides of the flask.

What compounds are heated under reflux together in the first step to create aspirin?

What compounds are heated under reflux together in the first step to create aspirin?

- 2-hydroxybenzoic and ethanoic anhydride with a few drops of sulfuric acid.
- Filter the product using vacuum filtration.

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

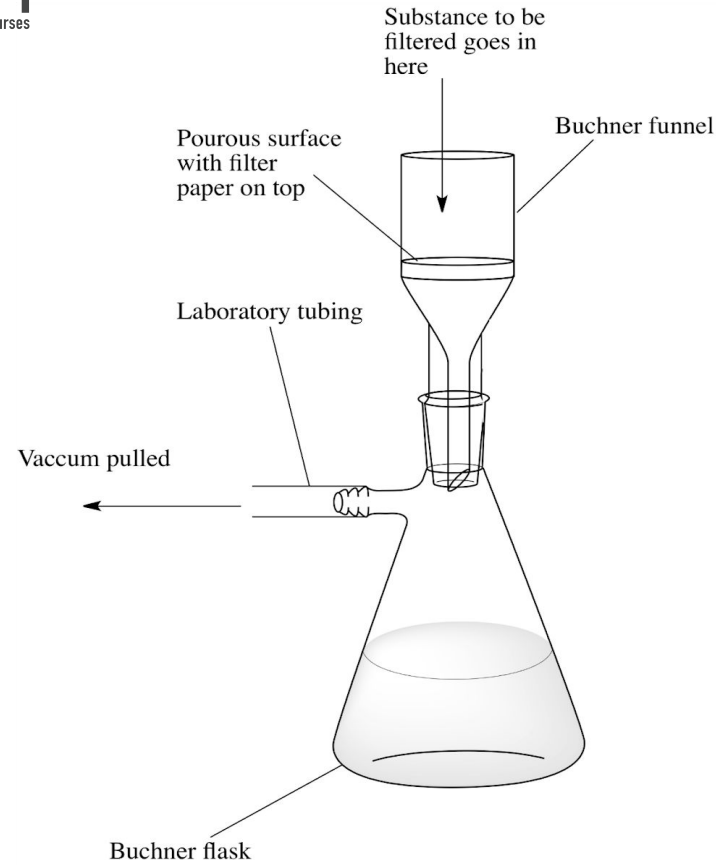
How do you use laboratory equipment to filter under reduced pressure?

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?



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, washing the solid with solvent, to obtain a dry crystalline solid.

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.

How do you calculate the percentage yield of a product?

How do you calculate the percentage yield of a product?

Percentage yield =

$$\frac{Actual\ yield}{Theoretical\ yield} \times 100$$