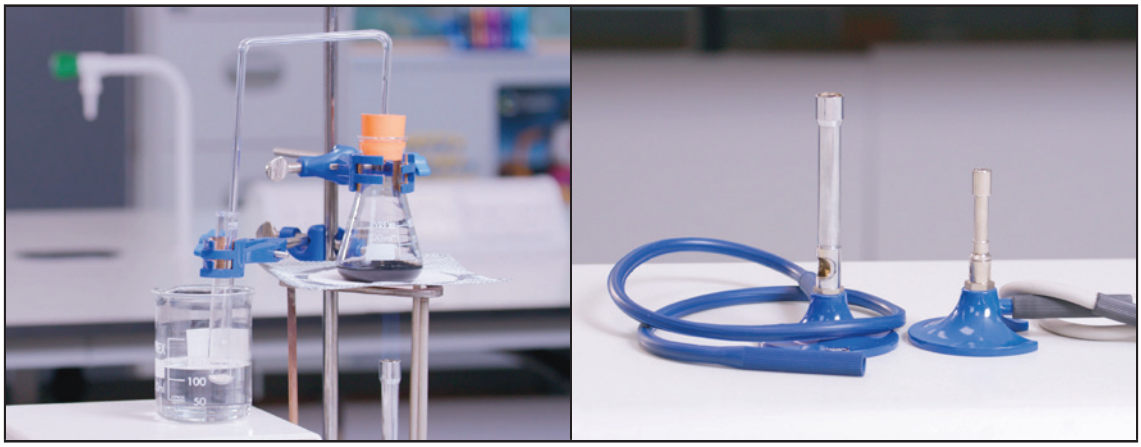
Simple distillation

Equipment (per group)

- Conical flask, 100 cm^3
- Measuring cylinder, 25 cm^3
- Coloured solution, 20 cm^3
- Bung and delivery tube
- Test tube
- Tripod
- Gauze
- Bunsen burner (mini, if available)
- Heatproof mat
- Matches/wooden splints
- Clamp stand with 2 bosses and 2 clamps
- Anti-bumping granules
- Beaker containing water and ice, 250 cm^3
- Test tube rack
- Watch glass
- Plastic pipette
- Anhydrous solid copper(II) sulfate, 1 spatula
- Eye protection: safety glasses to EN166 F

Find the full method in the supporting resources, available from: rsc.li/3sEJuwX.



Alternative equipment and method

If you have them, use mini Bunsen burners as the solution will boil gently without the need to adjust the flame at the gas tap. Consider practising reducing the flame with learners before heating the coloured solution if you are using a standard size Bunsen burner as it might boil over and ink will move up the delivery tube and into the test tube.

Using quickfit apparatus to demonstrate, see rsc.li/3QHuZjG for instructions.

Preparation

Make up the coloured solution with water and ink. Alternatives to inks include food dyes or squash.

Safety

- Read our standard health and safety guidance (available from: rsc.li/3lAmFA0) and carry out a risk assessment before running any live practical.
- Refer to SSERC/CLEAPSS Hazcards and recipe sheets. Hazard classification may vary depending on supplier.
- Ventilate the room and instruct learners to wear eye protection throughout.
- Ensure that the conical flask does not boil dry. Different liquids will boil at different temperatures so observe the reaction continuously.
- Take care when handling hot glassware as it can cause burns. Cool glass can also be slippery.

Chemical supplied for the practical	Preparation
Coloured solution can use ink, food dye or squash. Not usually considered as hazardous but check the supplier's safety data sheets.	
Anhydrous copper(II) sulfate, $CuSO_4(s)$  **DANGER** Harmful if swallowed. Causes skin irritation. Causes serious eye damage. Very toxic to aquatic life with long lasting effects. Heat produced when you add water. CLEAPSS Hazcard HC027C.	If slightly blue due to the absorption of moisture, dehydrate in a hot oven at 150°C, not over a Bunsen burner. Supply in small sample bottles with lids.

Disposal

- You will only use a small amount of copper sulfate so you can dissolve the solid waste in water to make a solution of concentration below 0.2 mol dm^{-3} then pour down a foul-water drain.
- Rinse all the equipment in washing-up liquid. Ink can stain the conical flasks so you may wish to keep a separate set of glassware for this experiment.