

Exercise walk-through

Separation and purification ■ 12.4

eXercise

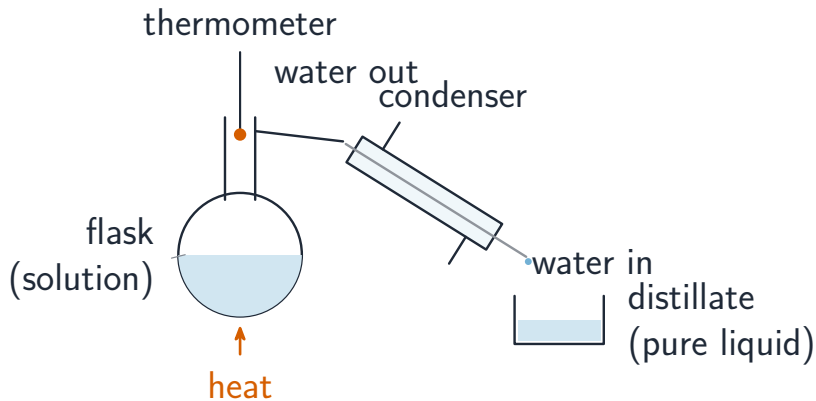
You must be able to

- choose the right method for a given mixture
- describe simple and fractional distillation
- check purity using melting and boiling points

Method — Distillation methods

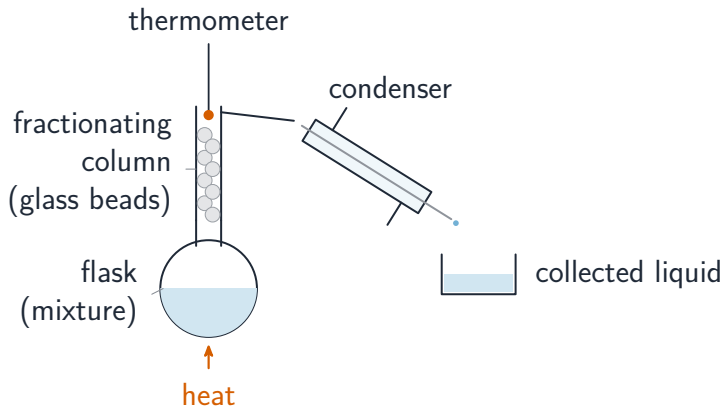
- filtration: insoluble solid from a liquid; crystallisation: soluble solid from solution.

Method — Distillation methods



Simple distillation: heat, condenser, distillate collected

Method — Distillation methods



Fractional distillation: adds a fractionating column

Practice 2.1 ■ 1 mark

Name the method to separate an insoluble solid from a liquid.

Solution 2.1

Method: Distillation methods

Worked steps

filtration **B1**.

Practice 2.2 ■ 1 mark

State how impurities affect the melting point of a substance.

Solution 2.2

Worked steps

impurities lower the melting point **B1**.

Exam-style 3.1 ■ 1 mark

To separate two liquids with different boiling points, you would use:

- A** filtration
- B** crystallisation
- C** fractional distillation
- D** chromatography

Solution 3.1

Method: Distillation methods

- A filtration
- B crystallisation
- C fractional distillation
- D chromatography



Worked steps

C. Fractional distillation separates liquids with different boiling points.

Exam-style 3.2 ■ 1 mark

A student wants pure water from salty water.

- (a) Name the method to use.
- (b) Describe how it separates the water from the salt.

Solution 3.2

Worked steps

- (a) simple distillation **B1**.
- (b) the water boils off and is cooled back to a liquid in the condenser **M1**; the salt is left behind in the flask **A1**.

Exam-style 3.3 ■ 2 marks

Explain how you could check that a sample of a solid is pure.

Solution 3.3

Worked steps

measure its melting (or boiling) point **M1**; a pure substance melts at a sharp, fixed temperature, while impurities lower it / give a range **A1**.