

Exercise walk-through

Water ■ 10.1

eXercise

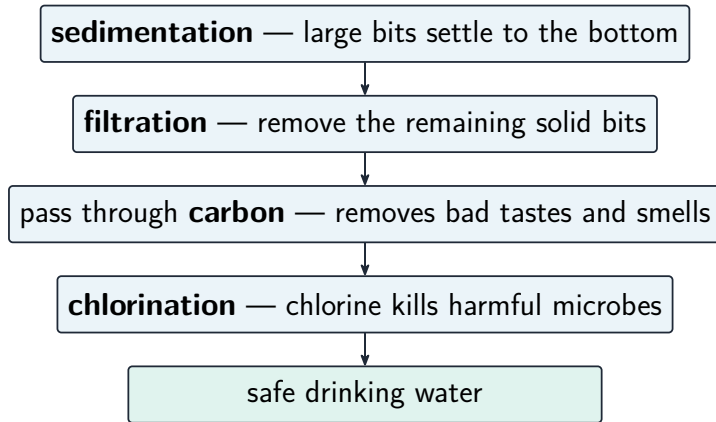
You must be able to

- give the chemical tests for water and the tests for purity
- describe what is in natural water (helpful and harmful)
- describe the steps in treating drinking water

Method — Testing and treating water

- **test for water:** anhydrous copper(II) sulfate white→blue; cobalt(II) chloride blue→pink.
- **test for purity:** pure water melts at 0 °C and boils at 100 °C.

Method — Testing and treating water



A flowchart: sedimentation → filtration → carbon → chlorination

Practice 2.1 ■ 2 marks

A student is given a colourless liquid and a strip of dry cobalt(II) chloride paper. Describe what she would see if the liquid contains water, and state what this test does **not** tell her.

Solution 2.1

Method: Testing and treating water

Worked steps

The paper turns from blue to pink **B1**; the test shows only that water is present, not that the liquid is pure water, so it cannot distinguish pure water from a solution **B1**.

Practice 2.2 ■ 1 mark

State the role of chlorine in water treatment.

Solution 2.2

Method: Testing and treating water

Worked steps

it kills harmful microbes **B1**.

Exam-style 3.1 ■ 1 mark

To show that a sample of water is **pure**, you would:

- A** add cobalt(II) chloride
- B** check it boils at exactly 100 °C
- C** filter it
- D** add chlorine

Solution 3.1

Method: Testing and treating water

- A add cobalt(II) chloride
- B check it boils at exactly 100 °C
- C filter it
- D add chlorine



Worked steps

B. Pure water boils at exactly 100 °C (impurities change this).

Exam-style 3.2 ■ 1 mark

Drinking water is treated in steps.

- (a) State the purpose of passing the water through carbon.
- (b) Explain why nitrates in natural water can be harmful to aquatic life.

Solution 3.2

Method: Testing and treating water

Worked steps

- (a) it removes bad tastes and smells **B1**.
- (b) nitrates cause deoxygenation (loss of oxygen) in the water **M1**; so aquatic life cannot get enough oxygen **A1**.

Exam-style 3.3 ■ 2 marks

Explain why distilled water, not tap water, is used in chemistry experiments.

Solution 3.3

Method: Testing and treating water

Worked steps

tap water contains dissolved impurities **M1**; these could interfere with reactions, whereas distilled water has far fewer impurities **A1**.