

0 1 . 1

Clean drinking water is important for health. In the UK water from reservoirs goes through a series of steps before it is safe to drink. **[2 marks]**

WARNING:
adding chlorine to water does not purify it - chlorine is added to kill microbes/ bacteria or sterilise water

What are the two main steps used to treat water from reservoirs?
Give a reason for each step.

Step 1 ... filter

Reason ... to remove solids or insoluble particles [step and reason for 1 mark]

Step 2 ... add chlorine/ozone/UV

Reason ... To reduce the number of microbes/to kill microbes/to sterilise [step and reason for 1 mark]

0 1 . 2

Explain why it is more difficult to produce drinking water from waste water than from water in lakes. **[3 marks]**

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water needs more / different processes [1]

.....

because it contains any two from:

- more organic matter
- more microbes
- toxic chemicals or detergents [2]

.....

.....

0 1 . 3

a) Pure water can be produced by distillation. **[1 mark]**

Why is distillation not usually an economic method of treating water for drinking?

High cost of energy/heating/uses a lot of energy [1]

.....

.....

b) How could the water be tested to show it is pure?
Give the expected result of the test for pure water. **[2 marks]**

Find the boiling point [1]

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it should be at a fixed temperature of 100°C / if it is impure it will boil at a temperature higher than 100°C [1]

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A student wanted to find out how much solid was dissolved in sea water.

This is the method the student used:

- measure the mass of an empty evaporating basin
- measure 25 cm³ of sea water and pour it into the evaporating basin
- heat the evaporating basin gently until all of the water has evaporated
- measure the mass of the evaporating basin containing the solid residue.

(a) What piece of apparatus would be suitable for measuring 25 cm³ of sea water? **[1 mark]**

measuring cylinder or pipette or burette [1]

(b) How could the student check that all of the water had evaporated? **[2 marks]**

(re)heat the evaporating basin [1]

weigh (again) or mass will not change [1]

(accept heat to constant mass for 2 marks)

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The results the student obtained using 25 cm³ of sea water are:

mass of empty evaporating basin = 23.21 g

mass of evaporating basin and dry solid residue = 24.04 g

Calculate the mass of solid dissolved in 1000 cm³ of the sea water.

correct answer with or without working scores [2]

allow mass of residue = (24.04 g - 23.21 g) = 0.83 for [1]

Mass dissolved in 1000 cm³ = $\frac{33.2 \text{ (g)}}{\dots\dots\dots}$ g
 allow ecf (mass of residue \times 40) for 1 mark **[2 marks]**

(Total 13 marks)

End