Water and use of resources

Edexcel GCSE Chemistry (1CH0) · Foundation and Higher

Show your working where needed. Check the worked answers when you finish.

Name _____ Date _____

1. Potable water

A treated water sample still contains some dissolved mineral salts. Explain what makes water potable and why the presence of dissolved salts does not automatically make it unsafe.

2. What does chlorination achieve?

A pupil chlorinates a water sample that contains suspended solids and microorganisms. The water still looks cloudy. Explain what chlorination achieves and suggest a method for removing the remaining solid.

3. The condenser and the flask

A sample of seawater is purified by simple distillation. Explain why water can be collected at the condenser outlet and where the dissolved salt ends up.

Scan to try fresh questions online

Try a core or harder question. Use clues and worked answers.

gcse.chemistryhelp.co.uk/worksheets/edexcel-resources-water/

Water and use of resources

Edexcel GCSE Chemistry (1CH0) · Foundation and Higher

4. Compare dissolved solids

A pupil evaporates 40 cm^3 of sample A and obtains 0.080 g of dry residue. Evaporating 80 cm^3 of sample B leaves 0.120 g. Which sample contains more dissolved solid per cm^3? Use both measurements in your working.

5. Checking a bottle comparison

A company says a new drinks bottle has a lower impact based on the energy used at the factory. State three other life-cycle stages to include and suggest an environmental impact to compare at one of those stages.

6. Choose water for an analysis

A laboratory has safe drinking water that contains dissolved salts and a supply of distilled water with no measurable dissolved salts. Which should be used for a test in which dissolved ions might produce a visible result? Explain.

Scan to try fresh questions online

Try a core or harder question. Use clues and worked answers.

gcse.chemistryhelp.co.uk/worksheets/edexcel-resources-water/

Water and use of resources

Edexcel GCSE Chemistry (1CH0) · Foundation and Higher

7. Evidence for choosing packaging

To provide the same service 100 times, packaging A causes 8 kg CO_2 equivalent of emissions and uses 60 L of water. B causes 5 kg and uses 90 L. Which better meets a target to reduce emissions? Use both sets of figures to explain why another buyer might choose differently.

8. Reuse makes the comparison fair

A reusable container has a production footprint of 2.4 kg CO_2 equivalent. Each use adds 0.04 kg from washing. A disposable one adds 0.18 kg per use. Compare their footprints for 20 uses. State one assumption.

9. Extra challenge · Choose two water treatment routes

A treatment plant can use a well that contains suspended sediment and bacteria, or seawater. A nearby laboratory also needs water for a test that is sensitive to dissolved salts.

Describe a route that makes the well water potable and a different route for the seawater. Decide which step can supply the laboratory and explain your choice.

Scan to try fresh questions online

Try a core or harder question. Use clues and worked answers.

gcse.chemistryhelp.co.uk/worksheets/edexcel-resources-water/

Worked answers

Water and use of resources · Edexcel GCSE Chemistry (1CH0) · Foundation and Higher

1. Potable water

Potable water is safe to drink. Its dissolved substances and microorganisms must be at safe levels. Potable water can contain dissolved minerals.

2. What does chlorination achieve?

Chlorination helps kill harmful microorganisms. It leaves suspended solids in the water. Use filtration to trap many solids while the water passes through.

3. The condenser and the flask

Water vaporises in the heated flask. Its vapour cools and condenses in the condenser, so liquid water leaves the outlet. The salt stays behind in the flask because it does not vaporise under these conditions.

4. Compare dissolved solids

A: $0.080 \div 40 = 0.0020$ g/cm^3. B: $0.120 \div 80 = 0.0015$ g/cm^3. A has the higher concentration of dissolved solids, although B left a larger mass from a larger sample.

5. Checking a bottle comparison

Include extracting and processing raw materials, using the bottle and dealing with it at the end of its life. For example, compare water use for washing during use, or waste sent to landfill after disposal.

Scan to try fresh questions online

Try a core or harder question. Use clues and worked answers.

gcse.chemistryhelp.co.uk/worksheets/edexcel-resources-water/

Worked answers

Water and use of resources · Edexcel GCSE Chemistry (1CH0) · Foundation and Higher

6. Choose water for an analysis

Use the distilled water. The salts in drinking water can add ions to the test and change the observation. Water can be safe to drink while still containing dissolved salts.

7. Evidence for choosing packaging

B saves 3 kg CO_2 equivalent for the same service. A uses 30 L less water, so an organisation that gives priority to water use could choose A.

8. Reuse makes the comparison fair

Reusable = 2.4 + (20 × 0.04) = 3.2 kg CO_2 equivalent. Disposable = 20 × 0.18 = 3.6 kg. The reusable option is lower by 0.4 kg. This assumes the same service per use and that the reusable container lasts for all 20 uses.

9. Extra challenge · Choose two water treatment routes

Let sediment settle and filter the well water to remove suspended solids. Chlorination then reduces the risk from microorganisms. Seawater can be distilled so that water vaporises and is collected after condensation while the dissolved salts remain.

Use the distilled water for analysis. The processes that make the well water safe to drink do not necessarily remove dissolved salts, which could interfere with the test.

Scan to try fresh questions online

Try a core or harder question. Use clues and worked answers.

gcse.chemistryhelp.co.uk/worksheets/edexcel-resources-water/