# 2.21 Concentration, Yield and Atom Economy: 10-minute Pack

Total Marks

AQA 8464 · Calculator allowed · about 10 minutes

Name: _____ Date: ____ / ____ / _____

**Answer ALL questions. Show all your working.**

**1** A technician, Priya, dissolves 8.0 g of sodium chloride in water to make 250 $cm^3$ of solution.

**(a)** State the formula linking concentration, mass of solute and volume of solution. **(1)**

**(b)** Convert 250 $cm^3$ to dm3. **(1)**

**(c)** Calculate the concentration of the solution in g/dm3. **(2)**

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**(Total for Question 1 is 4 marks)**

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**2** You have 250 $cm^3$ of a 0.200 mol/dm3 solution. You need a 0.0500 mol/dm3 solution. Calculate the final volume required (in cm3).

**(a)** Calculate the final volume in cm3. **(2)**

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**(Total for Question 2 is 2 marks)**

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**3** Give three reasons why the percentage yield of a reaction is usually less than 100%.

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**(Total for Question 3 is 3 marks)**


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# Mark scheme · 2.21 Concentration, Yield and Atom Economy: 10-minute Pack

## Question 1

| | |
|---|---|
| (a) concentration (g/dm3) = mass (g) / volume (dm3) oe | **B1** |
| **(a) Answer: concentration = mass / volume** | |
| (b) 0.25 (dm3) cao | **B1** |
| **(b) Answer: 0.25 dm3** | |
| (c) 8.0 / 0.25 oe (correct substitution, ft from (b)) | **M1** |
| (c) 32 (g/dm3) cao | **A1** |
| **(c) Answer: 32 g/dm3** | |

## Question 2

| | |
|---|---|
| (a) use C1V1 = C2V2 and calculate V2 = (C1 x V1) / C2 | **M1** |
| (a) 1000 $cm^3$ cao | **A1** |
| **(a) Answer: 1000 $cm^3$** | |

## Question 3

| | |
|---|---|
| the reaction may be reversible / may not go to completion oe | **B1** |
| some product is lost during separation/purification/transferring between containers (e.g. filtering, evaporating, transferring liquids) oe | **B1** |
| some reactants may react in unwanted/unexpected side reactions to form different products oe (accept: some product may be left behind in solution and not crystallise/precipitate out) | **B1** |

**Answer: Any three from: the reaction is reversible/does not go to completion; product is lost during separation or purification steps; some reactants take part in unwanted side reactions.**


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