2.6 Quantitative Chemistry: 10-minute Pack

AQA 8462 · Calculator allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 State the meaning of 'concentration' of a solution in terms of amount of substance.

(Total for Question 1 is 2 marks)

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2 A student has a 0.10 mol per dm3 solution of sodium hydroxide, NaOH. How many moles of NaOH are in 100 cm^3 of this solution?

(Total for Question 2 is 2 marks)

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3 A student heats magnesium ribbon in an open crucible until it burns completely to form a white powder, magnesium oxide.

(a) State the law of conservation of mass. **(1)**

(b) The total mass of magnesium oxide formed was 1.00 g. If 0.60 g of magnesium was used, calculate the mass of oxygen that combined with the magnesium. **(2)**

(c) Explain, in terms of particles, why the mass of the crucible and its contents increases during the reaction even though the crucible is open to the air. **(2)**

(Total for Question 3 is 5 marks)

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Mark scheme · 2.6 Quantitative Chemistry: 10-minute Pack

Question 1

amount of solute (in moles) dissolved per unit volume of solution, usually mol per dm3, oe **B1**

can be described as moles of solute per dm3 of solution, oe **B1**

Answer: Amount of solute (in moles) dissolved per unit volume of solution, mol per dm3.

Question 2

convert volume: 100 cm^3 = 0.100 dm3 then moles = concentration x volume = 0.10 x 0.100 **M1**

0.010 mol cao **A1**

Answer: 0.010 mol

Question 3

(a) No atoms are created or destroyed in a chemical reaction (oe), so the total mass of reactants equals the total mass of products in a closed system **B1**

(a) Answer: Mass is conserved: total mass of reactants = total mass of products.

(b) mass of oxygen = mass of MgO - mass of Mg (1.00 - 0.60) shown **M1**

(b) 0.40 g (cao) **A1**

(b) Answer: 0.40 g

(c) Oxygen (particles/molecules) from the air enters the crucible and reacts with the magnesium (oe) **B1**

(c) The oxygen becomes chemically bonded into the solid magnesium oxide, so extra mass is added to the solid that was not part of the original weighed magnesium (oe) **B1**

(c) Answer: Oxygen from the air combines with the magnesium and stays as part of the solid product, adding to the mass of the solid even though no mass is truly created.

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