GCSE Chemistry A (Gateway Science)

J248/01 Chemistry A C1-C3 and C7 (Foundation Tier)

Question Set 17

1 Two students heat some calcium carbonate, $CaCO_3$.

Look at the equation for the reaction.

$$CaCO_3(s) \longrightarrow CaO(s) + CO_2(g)$$

Calcium carbonate $\longrightarrow$ Calcium oxide + Carbon dioxide

(a) What is the meaning of **(s)** in the equation?

[1]

solid (state)

(b) Look at their results.

Mass of calcium carbonate (g)	Mass of calcium oxide (g)	Mass of carbon dioxide (g)
1.00	0.56	0.44
2.00	1.12	0.88
3.00	1.68	1.32
4.00	2.24	1.76

+0.44 +0.44 +0.44

Complete the table.

[1]

(c) Student **A** states:

'If I heat 20 g of calcium carbonate, I will make 8.8 g of calcium oxide and 11.2 g of carbon dioxide.'

Is student **A** correct?

Explain your answer.

[2]

	$CaCO_3$		CaO		CO_2
	1	:	0.56	:	0.44
x20	20	:	11.2	:	8.8

No, because 11.2 g of calcium oxide and 8.8 g of carbon dioxide would be produced.

(d) Student **B** investigates another reaction.

Look at the equations.

$2Mg(s) + O_2(g) \longrightarrow 2MgO(s)$

magnesium + oxygen ⟶ magnesium oxide

(i) Calculate the relative formula mass of magnesium oxide.

Mg = 24 O = 16

24 + 16 = 40

Answer = ... 40 ..... **[1]**

(ii) Use the relative formula mass of magnesium oxide and the relative atomic masses of magnesium and oxygen to show if mass is conserved during this reaction.

[2]

$2Mg + O_2 \Rightarrow 2 \times 24 + 2 \times 16 = 80$

$2MgO \Rightarrow 2 \times 40 = 80$ ∴ both sides have 80 for mass

Total Marks for Question Set 17: 7