Oxford Cambridge and RSA

GCSE Chemistry A (Gateway Science)

J248/02 C4-C6 and C7 Foundation (Foundation Tier)

Question Set 25

1 This question is about the extraction of metals.

(a) When iron oxide is heated with carbon, iron is made.

(i) Complete the **word equation** for this reaction.

iron oxide + carbon → Iron + carbon dioxide **[1]**

Explain how you can tell that iron oxide is reduced. **[1]**

Iron oxide lost oxygen to form iron and loss of O_2 is reduction.

(b) Look at the reactivity series of some metals. Carbon is also included.

Calcium	Most reactive
Magnesium	↑
Aluminium	
(Carbon)	
Zinc	
Iron	
Tin	
Copper	Least reactive

(i) Zinc is usually extracted from zinc oxide by **heating zinc oxide with carbon**.

Explain why. Use the reactivity series to help you. **[1]**

Because carbon is more reactive than zinc (higher up in the reactivity series)

(ii) Aluminium is extracted from aluminium oxide by **electrolysis**. **[1]**

Explain why. Use the reactivity series to help you.

Because carbon is below the aluminium in the reactivity series, carbon can no longer be used to extract aluminum.

(c) The table shows some information about aluminium and zinc.

Metal	Cost of 1 kg (£)	Amount in Earth's crust (%)
Aluminium	1.31	8.1
Zinc	2.51	0.0078

Suggest **two** reasons why it could be more important to recycle zinc than aluminium.

Use information from the table to help you.

1 Very small amount of zinc is available naturally

2 Zinc is more expensive than aluminium

[2]

(d) Aluminium alloys are often used to build aircraft.

A sample of an aluminium alloy contains 1.28 g of magnesium and 43.70 g of aluminium only.

Calculate the **percentage of magnesium** in this alloy.

Give your answer to **3** significant figures.

$\frac{1.28}{1.28+43.7} \times 100 = \frac{1.28}{44.98} \times 100 = 2.85\%$

Percentage of magnesium = 2.85 % **[4]**

Total Marks for Question Set 25: 10