

1. The table shows the results of the reactions between four metals and their metal oxides.

Key: ✓ = reaction ✗ = no reaction

	Metal W oxide	Metal X oxide	Metal Y oxide	Metal Z oxide
Metal W		✗	✗	✗
Metal X	✓		✓	✗
Metal Y	✓	✗		✗
Metal Z	✓	✓	✓	

What is the correct order of reactivity of the metals, from the most reactive to the least reactive?

- A** W, Y, X, Z
- B** W, Z, Y, X
- C** Z, X, Y, W
- D** Z, Y, X, W

Your answer

[1]

2. What happens when liquid bromine, Br₂, boils?

- A** Covalent bonds break
- B** Electrostatic forces break
- C** Intermolecular forces break
- D** Ionic bonds break

Your answer

[1]

3. What is the balanced equation for the reaction of sodium with oxygen?

- A** $\text{Na} + \text{O} \rightarrow \text{NaO}$
- B** $\text{Na} + \text{O}_2 \rightarrow \text{NaO}_2$
- C** $4\text{Na} + \text{O}_2 \rightarrow 2\text{Na}_2\text{O}$
- D** $\text{Na}_2 + 2\text{O} \rightarrow 2\text{NaO}$

Your answer

[1]

4. Which row describes the three halogens at room temperature?

	Chlorine	Bromine	Iodine
A	green gas	orange-brown gas	grey solid
B	green gas	orange-brown liquid	grey solid
C	green gas	orange-brown liquid	purple gas
D	green liquid	orange-brown liquid	grey solid

Your answer

[1]

5(a). Iron reacts with dilute sulfuric acid, H_2SO_4 .

Iron sulfate, FeSO_4 , and hydrogen gas, H_2 , are made.

- i. Write the **balanced symbol** equation for this reaction.

[1]

- ii. A student reacts 2.8 g of iron with dilute sulfuric acid.

The student makes 5.4 g of iron sulfate.

They predicted that they should have made 7.6 g of iron sulfate.

Calculate their **percentage yield**.

Give your answer to **1** decimal place.

Percentage yield of iron sulfate = % [3]

(b). The table shows information about the physical properties of four elements, **W**, **X**, **Y** and **Z**.

	W	X	Y	Z
Density (g / cm³)	0.97	7.87	0.003	1.74
Melting point (°C)	98	1538	−102	650
Conducts electricity?	✓	✓	X	✓

Which element is a non-metal?

Give a reason for your answer.

Element _____

Reason _____ [2]

(c). One of the elements is sodium in Group 1.

Which element is sodium?

Give a reason for your answer.

Element _____

Reason _____ [2]

(d). One of the elements is a transition metal.

- i. Compare the physical and chemical properties of Group 1 metals and transition metals.
Use the information in the table, and your own knowledge.

[3]

- ii. Transition metals can be used as catalysts.

What is meant by a catalyst?

[2]

[6]

9. Why is magnesium more reactive with dilute acids than zinc?

- A** Magnesium forms positive ions more easily than zinc.
B Magnesium forms negative ions more easily than zinc.
C Magnesium gains electrons more easily than zinc.
D Magnesium gains hydrogen more easily than zinc.

Your answer

☐

[1]

10. Chlorine and iodine are Group 7 elements.

	Chlorine	Iodine
A	green gas	purple gas
B	pale yellow gas	grey-black solid
C	green gas	grey-black solid
D	pale yellow gas	purple gas

Which row in the table describes these elements **at room temperature**?

Your answer

☐

[1]

END OF QUESTION PAPER