



Unit 9 • Matter: the periodic table and chemical reactions

Name _____ Class _____ Roll no. _____ Date _____ Marks _____ / 36

1 Key words

[4]

Fill in the blanks with words from the box. Two words in the box are not needed. Each blank carries 0.5 mark.

alkali metals atomic number atomic weight group halogens inert gases period
products reactants skeleton equation

In the modern periodic table, the elements are arranged in order of increasing _____. A vertical column of the table is called a _____, and a horizontal row is called a _____. The very reactive metals of group 1 are called _____. The elements of group 17 need just one more electron to become stable; they are called _____. The elements of group 18 hardly ever react: they are the _____. The substances that take part in a chemical reaction are the _____. A formula equation that is not yet balanced is called a _____.

2 Label the diagram

[4]

The diagram shows the atoms of period 3. Write the electronic configuration of each atom in place of 1 to 8. Each carries 0.5 mark.

Na	Mg	Al	Si	P	S	Cl	Ar
①	②	③	④	⑤	⑥	⑦	⑧
1	2	3	4	5	6	7	8
1	2	3	4	3	2	1	0

middle row: valence electrons • bottom row: valency

same 3 shells; atoms get smaller, metallic character falls



- _____
- _____
- _____
- _____
- _____
- _____

- _____
- _____
- _____
- _____
- _____
- _____



[5]

Choose the correct option for each of the following questions.

- i. Who gave us the modern periodic table? [1]
 - a. Dmitri Mendeleev
 - b. Henry Moseley
 - c. John Dalton
 - d. Niels Bohr
- ii. On what basis are the elements arranged in the modern periodic table? [1]
 - a. atomic weight
 - b. atomic mass
 - c. molecular mass
 - d. atomic number
- iii. Which statement about the groups is true? [1]
 - a. elements in the same group have different chemical and physical properties
 - b. the atomic size decreases from top to bottom of a group
 - c. elements in the same group have the same valency
 - d. the non-metallic character increases from top to bottom of a group
- iv. What do argon and chlorine have in common? [1]
 - a. both are inert gases
 - b. both are in the same period
 - c. both are equally reactive
 - d. both are in the same column
- v. An element has the electronic configuration 2, 8, 7. Where is it in the periodic table, and what kind of element is it? [1]
 - a. group 1, a very reactive metal
 - b. group 18, an inert gas
 - c. group 17, a very reactive non-metal (a halogen)
 - d. group 7, a metal

[3]

Write very short answers to the following questions.

- a. How many groups and how many periods does the modern periodic table have? [1]
-
-
- b. Which metal is liquid at room temperature? [1]
-
-
- c. Potassium is 2, 8, 8, 1. In which period of the periodic table is it? [1]

[8]

Write short answers to the following questions.

- a. Write any two differences between a group and a period. [2]
-
-
-



b. Give a reason: sodium and chlorine are in different groups, but both have valency 1. [2]

c. How does the metallic character of the elements change from top to bottom in a group? Why? [2]

d. The equation for the reaction between zinc and hydrochloric acid is $\text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2$. Write the equation if sulphuric acid is used instead of hydrochloric acid. [2]

6 Long answers [8]

Write long answers to the following questions.

a. Part of a group of the periodic table is shown: Be, Mg, Ca, one below the other. Name the group and write any four of its characteristics. [4]

b. Write these reactions as balanced chemical equations: [4]

- i. calcium carbonate + hydrochloric acid $\rightarrow$ calcium chloride + water + carbon dioxide
- ii. potassium + chlorine $\rightarrow$ potassium chloride
- iii. sodium + oxygen $\rightarrow$ sodium oxide
- iv. hydrogen + oxygen $\rightarrow$ water



7 Balancing equations

[2]

Balance this equation. Show your working.

Nitrogen reacts with hydrogen to form ammonia: $\text{N}_2 + \text{H}_2 \rightarrow \text{NH}_3$

Balance the equation, and count the atoms of each element on both sides in the table to show that it is balanced.

Element	Left side	Right side
N		
H		

Answer: _____

8 Think

[2]

Think, then answer.

Give a reason: metals and non-metals are kept apart in the periodic table.

9 Activity: Find each element's seat

(not marked)

Draw an outline of the first four periods of the periodic table (groups 1, 2 and 13–18). Write the symbols of the elements with these electronic configurations in their places, and fill in the table: for the kind of element, write metal, non-metal or inert gas.

Electronic configuration	Element	Group	Period	Kind of element
2, 1				
2, 6				
2, 8, 2				
2, 8, 7				
2, 8, 8				
2, 8, 8, 1				

