

RBHS

Science

Year 10 – The Structure of Matter

Credits: 2

Year: 2014

Strand: Mixed

Time: 50 minutes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name: Class: Teacher: | | | | | |
|  |  |  |  |  |  |
| Achieved |  | Achieved with Merit |  | Achieved with Excellence |  |
|  |  |  |  |  |  |
|  |  | Final Grade | |  |  |
|  |  |  | |  |  |

QUESTION ONE

Assessor’s use only

(A)

(A)

(M)

(E)

* 1. Give the word that best describes the following types of matter

|  |  |
| --- | --- |
| Atom, compound, crystal, element, mixture, stucture | |
| Matter that only contains **one type** of atom | \_\_\_\_\_\_\_\_\_\_\_\_ |
| Two or more different types of atoms that are **chemically joined** together. | \_\_\_\_\_\_\_\_\_\_\_\_ |
| Two or more elements and/or compounds that are **not joined** together. | \_\_\_\_\_\_\_\_\_\_\_\_ |

* 1. Describe how liquids and gases are able to take the shape of their containers, but solids cannot.

Your answer should consider

* drawing a diagram
* the spacing and arrangement of the particles
* the movement of the particles

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |

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QUESTION TWO

Assessor’s use only

(A)

(M)

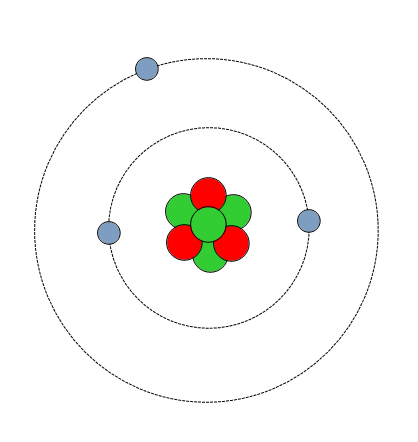
(A)

(A)

(M)

1. A Lithium atom can be represented by the diagram below.

Correctly label the parts of the atom.



b)

a)

c)

1. What charges do the parts above have?

a)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Complete the following table

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Symbol | Atomic  number | Mass  number | Number  of protons | Number of electrons | Number of neutrons |
| Al | 13 | 27 | 13 |  |  |
| C |  | 12 |  | 6 | 6 |
| Na | 11 | 23 | 11 |  | 12 |
| O | 8 | 16 |  | 8 | 8 |

QUESTION THREE

Assessor’s use only

(A)

(M)

(A)

(M)

(E)

(A)

(M)

(E)

1. state how an atom can become an ion

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. complete the following table

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Symbol | Name | Number of electrons | Electron arrangement | Does it lose or gain electrons to become an ion? | Number of electrons lost or gained | Ion Symbol |
| Na | sodium | 11 |  |  |  | Na+ |
| N | nitrogen |  | 2,5 | Gain |  |  |
| Al | aluminium |  | 2,8,3 |  |  |  |
| S | sulfur | 16 |  |  |  |  |

1. **Discuss** the similarities between **Li, Na and K atoms** in terms of their position in the periodic table, their electron arrangements and the ions they form.

1. Explain why the noble gases **He, Ne and Ar do not lose or gain electrons** and why they are sometimes called **inert gases.**

Assessor’s use only

(A)

(M)

(A)

(M)

(A)

(M)

(E)

1. Name the following compounds:

eg PbF2 lead fluoride

1. NaCl \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. KOH \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. H2S \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. CuSO4 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. AgNO3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. Complete the table to find the formula for the following compounds:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | name of compound | positive ion | negative ion | formula |
| eg | hydrogen oxide | H+ | O2- | H2O |
| (i) | magnesium oxide |  |  |  |
| (ii) | aluminium chloride |  |  |  |
| (iii) | sodium hydrogen carbonate |  |  |  |
| (iv) | calcium carbonate |  |  |  |
| (v) | lithium oxide |  |  |  |

QUESTION FOUR

Assessor’s use only

(A)

(A)

(M)

(E)

* 1. Write a **‘P’** or a **‘C’** to show if a physical or chemical change is taking place**.**

|  |  |  |  |
| --- | --- | --- | --- |
| \_\_\_\_ | glass breaking | \_\_\_\_ | burning leaves |
| \_\_\_\_ | a rusting bicycle | \_\_\_\_ | fireworks exploding |
| \_\_\_\_ | bleaching your hair | \_\_\_\_ | crushing a can |
| \_\_\_\_ | mixing salt and water | \_\_\_\_ | boiling water |

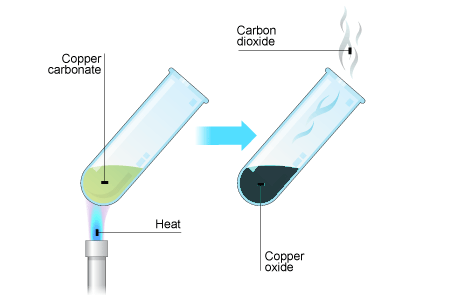
* 1. Discuss the difference between a chemical and a physical change

Your answer should consider

* what you would observe in each
* whether you can undo the change
* how atoms are arranged before and after the change

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QUESTION FIVE

Assessor’s use only

(A)

(M)

(A)

(M)

(E)

* 1. When copper carbonate (a green powder) is heated, it changes colour to black copper oxide and carbon dioxide gas is given off.

Write the **word equation** for this reaction in the box below:

|  |
| --- |
| → |



* 1. When zinc metal is placed in hydrochloric acid (HCl) hydrogen gas is given off and the zinc disappears to give a colourless solution of zinc chloride.

Write the **word equation** for this reaction in the box below:

|  |
| --- |
| → |

Write the **chemical equation** for this reaction in the box below:

|  |
| --- |
| → |

* 1. When a Bunsen burner is lit the methane fuel (CH4) reacts with oxygen in the air to make carbon dioxide and water.

Assessor’s use only

(A)

(M)

Write the **word equation** for this reaction in the box below:

|  |
| --- |
| → |

Table of ions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **+1** | **+2** | **+3** | **-2** | **-1** |
| H+ | Mg2+ | Al3+ | O2- | Cl- |
| Li+ | Ca2+ |  | S2- | OH- |
| Na+ | Cu2+ |  | CO32- | NO3- |
| K+ | Zn2+ |  | SO42- | HCO3- |
| Ag+ | Pb2+ |  |  |  |

He

2

4

Helium

Ne

10

20

Neon

Ar

18

40

Argon

H

1

1

Hydrogen

Li

3

7

Lithium

Na

11

23

Sodium

Be

4

9

Beryllium

Mg

12

24

Magnesium

B

5

11

Boron

Al

13

27

Aluminium

C

6

12

Carbon

Si

14

28

Silicon

N

7

14

Nitrogen

P

15

31

Phosphorus

O

8

16

Oxygen

S

16

32

Sulfur

F

9

19

Fluorine

Cl

17

35

Chlorine

K

19

39

Potassium

Ca

20

40

Calcium