**Name: ................................................ Adm no:......... Class..........................**

**233**

**CHEMISTRY ALLIANCE HIGH SCHOOL**

 **FORM 3 HOLIDAY ASSIGNMENT**

 ****

 **STRONG TO SERVE**

 **Octopus Revision Module: periodic table**

1. The grid below represents part of the periodic table. The letters do not represent the actual symbols of the elements. Study it and answer the question that follows:

|  |  |
| --- | --- |
| L |  |
| U | X |
| V | Y |
| W |  |
|  |  |

|  |
| --- |
|  L  |
|  M  | P |  |  | T |  | J |
| N | Q |  | R | S |  | B |
| H |  |  |  |  |  |  |
| K |  |  |  |  |  |  |

1. Explain why element **L** appears in two different groups in the grid above. (1mk)
2. State the name of the chemical family to which P and Q, X and Y belong. (1mk)
3. Write the formula of the compound formed between P and V (1mk)
4. i) Compare the melting points of N and K, and S, V and W. Explain. (6mks)

ii) Compare the atomic radius of H and W. (2mks)

iii) Select the element with the smallest and largest atomic radius. Explain (2mks)

1. Identify an element whose oxide dissolves in both acids and alkalis (1mk)
2. Write the equation for the burning of T in excess air (1mk)
3. Using dots (.) and crosses (x) to represent the electrons, draw a diagram to illustrate bonding in sulphide Q and chloride of R. (2mks)

State one use of element X

i) Select the most electronegative and the most electropositive element. (2mks)

ii) Select the strongest reducing and the strongest oxidising agent. (2mks)

iii) Compare the melting point and boiling point of the oxide T and S (2mks)

iv) Give two commercial uses of element J (2mks)

v) Select an element that exists as:

* Diatomic molecule
* Mono-atomic gas
* Tetra-atomic molecule
* Octa-atomic molecule

vi) Compare the atomic mass of H and M (2mks)

vii) Compare the reactivity of H and M (2mks)

viii) Element Z is in the third period and forms ions with charge -3, place it in the grid above.

ix) Element Z forms two ions, write the formula and configuration of the ions.

x) Elements P, Q, R, and S have atomic numbers 2, 14, 18 and 20 respectively select two elements in

 the same chemical family.

xi) Write the configuration of the phosphorous in the following

* PH**3**
* PO**33**-
* PO**43**-

Write the configuration of

* Ca2+
* O-
* Al+2
1. The diagram below shows the bonding between aluminium chloride and ammonia.

 H Cl

H N Al Cl

 H Cl

 a) Name the types of bonds that exist in the molecule. (1mk)

 b) How many electrons are used for bonding in the molecule? (1mk)

3. Study the data in the table below and answer the questions that follow. The letters do not represent actual symbols of the elements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Element | Atomic No | M.P.0(C) | B.P.0( C) | Ionic radius(nm) |
| A | 11 | 98 | 890 | 0.095 |
| B | 12 | 650 | 1110 | 0.065 |
| C | 13 | 660 | 2470 | 0.050 |
| D | 14 | 1410 | 2360 | 0.41 |
| E | 15 | 44.2, 590 | 280 | 0.034, 0.212 |
| F | 16 | 113, 119 | 445 | 0.184 |
| G | 17 | -101 | -35 | 0.181 |
| H | 18 | -189 | -186 |  |

1. i) Write electronic arrangement of atoms represented by letters B and F

ii) State the nature of the oxides of the elements represented by letters B and F

1. Why does the element represented by letter E have two value of melting point?
2. Explain the following observations in terms of structure and bonding :

i) There is an increase in boiling point from A to C

ii) Element D has a high boiling point.

iii) F has a higher boiling point than G.

1. Explain the difference in ionic radius between the elements represented by letters A and G
2. Write the formulae and the electronic arrangement of the two ions E whose ionic radii are shown in the table.
3. The figure below represents trends of some properties of period three elements. Study it and answer the questions that follow.

 Atomic number

Trend

 in

property

 Atomic radius

 **Na Mg Al Si P S Cl Ar**

 **Elements**

a) Explain the trends shown by the atomic numbers and the atomic radii:

 i) Atomic number (1mk)

 ii) Atomic radii (2mks)

b) On the same axes, sketch the trend of reactivity across the period. (1mk)

c) Write down the electronic configuration of phosphorous and sulphur in the following compounds:

 i) H3PO4 (P =15)

 ii) Na2S2O3 (S=16)

d) i) One of the elements given in the figure above is stored under water. Identify the element and give a reason as to why it is stored under water (1mk)

 ii) State one use of aluminium that can be associated with malleability (1mk)

e) Explain the observation that would be made if chloride of Phosphorous is exposed in moist air (2mks)

f) Distinguish between the terms electro negativity and electron affinity as used in chemistry (2mks)

5. Explain why the boiling point of ethanol is 78°C while that of dimethyl ether is 24°C, although they have the same molecular mass. (2mks).

6. Name the particles responsible for electrical conductivity in:

 a) Molten magnesium chloride (1mk)

 b) Molten magnesium (1mk)

 c) Magnesium metal (1mk)

 HAPPY HOLIDAY@ CHEMISTRY DEPARTMENT