**Revision Sheet #2** **|** Lower Secondary Stage (6-8)

1st Semester | 2023-2024

**Name:** \_\_\_\_\_\_\_\_\_\_\_

|  |  |
| --- | --- |
| **Subject:** Science/ Chemistry | **Chapter:** Ions, Ionic Compounds and Ionic Bonds |
| **Objectives:**   * Define atoms and ions. * Draw atomic configuration of different atoms and ions. * Name different ionic compounds. * Draw dot and cross diagrams. | |

**1 – IONS**

An ion is an atom that has gained one or more electrons to be negatively charged, or lost one or more electrons to be positively charged.

Atoms form ions to gain a stable electron configuration.

The chemical formulae of an ion shows the chemical symbol of the element and the charge of the ion.

**Positive ions (Cations) and Negative ions (Anions):**

|  |  |  |
| --- | --- | --- |
|  | **Positive ions** | **Negative ions** |
| **Net charge** | Positive (+) | Negative (-) |
| **Formation** | Formed when the atom loses electrons | Formed when the atom gains electrons |
| **Element type** | Metals | Non-metals |

***Let’s practise!***

* How can you tell how many electrons does an element have in its outer shell?
* What happens to the electrons in the outermost shell when ionic bonds are formed?
* Complete the following table.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Element’s symbol | Atomic configuration | No. of electrons in the atom | No. of protons in the atom | No. of electrons in the ion | No. of protons in the ion | No. of electrons lost or gained | Charge of ion | Name of ion |
| **Na** |  |  |  |  |  |  |  |  |
| **Cl** |  |  |  |  |  |  |  |  |
| **O** |  |  |  |  |  |  |  |  |
| **Al** |  |  |  |  |  |  |  |  |

* Draw the atomic configuration of the following.

Flouride ion Calcium ion

Nitride ion Potassium ion

**2 – Ionic compounds**

Ionic compounds are made of positive and negative ions.

When elements (a metal and a non-metal) combine with each other, they form an ionic bond.

How to write the chemical formulae of an ionic compound:

* Write the symbol and charge of the positive ion (metal) first and then the negative ion (non-metal).
* Transfer the number of the positive charge to become the susbscript of the non-metal and the number of the negative charge to become thr subscript of the metal.

**Example:** Ca 2+  O 2- Al 3+ Cl 1-

CaO AlCl3

***Let’s practise!***

* Draw a diagram to represent the bonding between a sodium atom and a chlorine atom.
* Draw a diagram to represent the bonding between a magnesium atom and a fluorine atom.
* Complete the following table with the missing information.

|  |  |  |
| --- | --- | --- |
| Reactants | Chemical formulae | Name of ionic compound |
| Ca + Br |  |  |
| Mg + O |  |  |
| Li + F |  |  |

* Fill in the missing information in the table below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Positive ion | Formulae of positive ion | Negative ion | Formulae of negative ion | Formulae of the compound |
|  |  |  |  | MgCl2 |
| Potassium ion |  |  | Br1- |  |
|  |  |  |  | CaO |
| Lithium ion |  | Fluoride ion |  |  |