

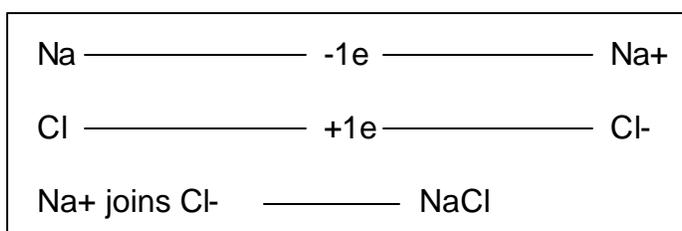
Grade 9 Science – Unit 1
Naming Compounds – A Basic Introduction

What is an IONIC BOND?

An Ionic Bond is a bond formed by the attraction between two oppositely charged ions.

- ? An ionic bond is formed between metals and non-metals.
- ? The metal gives one or more electrons, while the non-metal takes the electron(s).
- ? This causes the metal to become positively charged and the non-metal to become negatively charged

Example --- Formation of sodium chloride (Table Salt or NaCl)



As can be seen, a sodium atom has one electron in its outer orbit, which it needs to lose to attain a stable electronic configuration. Chlorine has seven outer orbit electrons. It needs one more electron to attain a stable configuration. Sodium atom transfers an electron to the chlorine atom, and an ionic bond is formed.

When the sodium atom gave away an electron and became Na⁺ it is called a CATION. Likewise when the chlorine atom took the electron to become Cl⁻ it is called an ANION.

Naming this compound

- ? The metal ion's name does not change regardless of charge
- ? The non-metal's name ends in **ide**

Example:

- ? AlCl₃ = aluminum chlor**ide**
- ? Na₂S = sodium sulf**ide**
- ? K₂O = potassium **oxide**
- ? MgH₂ = magnesium hydr**ide**

What is a COVALENT BOND?

A covalent compound is a compound in which the atoms that are bonded SHARE electrons. Electrons are NOT transferred (i.e., given or taken).

- ? A covalent bond is formed when two non-metals bond to each other.

How is it possible for two ions with a similar negative charge can bond since same charges repel?

- ? It is electronegativity. In our study of the element, you have likely learned that your element has electronegativity. In simple terms, electronegativity is a measure of how much an element pulls electrons away from other elements. An element that takes electrons has a high electronegativity.

Questions

1. Metals give electrons. Is the electronegativity of a metal high or low?
 2. Will metals form covalent bonds IF they have low electronegativity? Yes or No. Give one reason.
- ? When a non-metal bonds with another non-metal, it is because the elements have almost the same electronegativity. Neither element can give or take electrons. To be in a stable electron configuration, they share electrons.

This bonding gives a POLYATOMIC ION.

- ? SO_4 - Sulphate
- ? SO_3 - Sulphite
- ? NO_3 – Nitrate
- ? NO_2 – Nitrite
- ? PO_4 – Phosphate
- ? PO_3 – Phosphite
- ? OH - Hydroxide

NOTE: The polyatomic ion STAYS TOGETHER. It has its own charge. For example, the Sulphate has a charge of -2 or SO_4^{-2}

The names the polyatomic ions must be remembered. NOTE: the ITE is one less than the ATE

What is the name of the compound when an ion made up of two or more elements that are covalently-bonded (Polyatomic Ion) bonds with a metal?

Just keep the name of the metal and the polyatomic ion.

- ? H_2SO_4 is Hydrogen sulphate
- ? KNO_3 is Potassium nitrate
- ? Na_2PO_3 – Sodium phosphite

PRACTICE

Name the following compounds

Chemical Compound	Name
HNO_3	
LiCl	
Na_2O	
MgF_2	
K_2SO_4	
NaOH	
Al_2S_3	

As a reminder...

How many elements are in each of the following compounds? As well, how many atoms of each element are there in each compound?

Chemical Compound	Chemical Symbol for Each Element	Number of Atoms of Each Element
HNO_3	H N O	1H 1N 3O
$\text{C}_{12}\text{H}_4\text{O}_2\text{Cl}_4$		
CH_3COO		
K_2SO_4		