CLASS 9- SCIENCE

CHAPTER 3- ATOMS AND MOLECULES

PART 5- WRITING CHEMICAL FORMULAE

CHEMICAL FORMULA

The chemical formula of a compound is the symbolic representation of the composition of a compound. From the formula we can know the number and kinds of atoms of different elements that constitute the compound.

VALENCY

Valency is the ability of an element to combine with other element. It is obtained by determining the number of electrons in the outermost shell (valence shell) of each atom of an element. It is the capability of an atom to gain or lose electron in order to achieve the noble gas configuration.

RULES FOR WRITING CHEMICAL FORMULAE

- Write the symbols of the elements or ions which combine to form a molecule of the compound such that the symbol of the metal or the positive ion is written first on the left side and the symbol of the non-metal or the negative ion is written afterwards on the right side in the formula of the compound.
- Write the valencies of each element or ion below it.
- Interchange or cross over the valencies of the combining elements or ions and write them as the subscript.
- Polyatomic ions must be written in brackets, before the subscript is written. In case the number of polyatomic ion is one, the bracket is not required. For example-NaOH

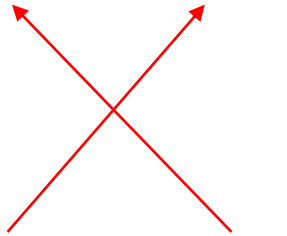
VALENCY TABLE

Valency	Name of ion	Symbol	Non-metallic element	Symbol	Polyatomic ions	Symbol
1	Sodium Potassium Silver Copper (I)	Na^+ K^+ Ag^+ Cu^+	Hydrogen Hydride Chloride Bromide Iodide	H^+ H^- Cl^- Br^- I^-	Ammonium Hydroxide Nitrate Hydrogen carbonate	NH_4^+ OH^- NO_3^- HCO_3^-
2	Magnesium Calcium Zinc Iron (II) Copper (II)	Mg^{2+} Ca^{2+} Zn^{2+} Fe^{2+} Cu^{2+}	Oxide Sulphide	O^{2-} S^{2-}	Carbonate Sulphite Sulphate	CO_3^{2-} SO_3^{2-} SO_4^{2-}
3	Aluminium Iron (III)	Al^{3+} Fe^{3+}	Nitride	N^{3-}	Phosphate	PO_4^{3-}

EXAMPLES

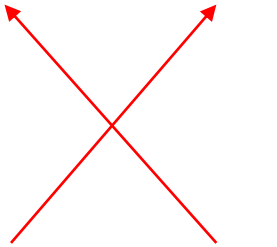
1) Formula of Sodium Chloride

Symbol	Na	Cl
Valency	1+	1-
Formula	NaCl	



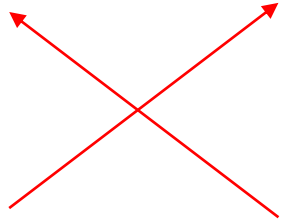
2) Formula of Sodium Oxide

Symbol	Na	O
Valency	1+	2-
Formula	Na_2O	



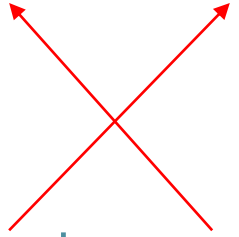
3) Formula of Aluminium Oxide

Symbol	Al	O
Valency	3+	2-
Formula	Al_2O_3	



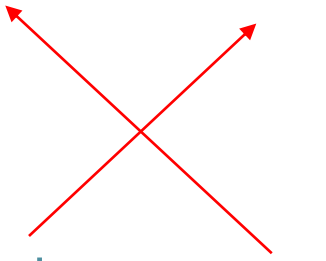
4) Formula of Sodium Nitrate

Symbol	Na	NO_3
Valency	1+	1-
Formula	$NaNO_3$	



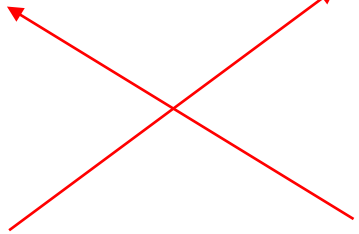
5) Formula of Calcium Hydroxide

Symbol	Ca	OH
Valency	2+	1-
Formula	$Ca(OH)_2$	



6) Formula of Ammonium Sulphate

Symbol	NH_4	SO_4
Valency	1+	2-
Formula	$(NH_4)_2SO_4$	



THANK YOU