

Things to Think About as We Start the Next Unit

- Where are the metals and the nonmetals located on the periodic table?
- What do you remember from grade 10 about ionic and molecular compounds?
- What do you know about acids and bases?

Unit 2 - Compounds

- **Introduction**
- **Ionic Compounds**
- **Molecular Compounds**
- **Acids and Bases**

**NAMES
&
FORMULAS**

Unit 2 - Compounds

COMPOUNDS are conventionally divided into three classes:

(1) **metal - nonmetal** (ionic compounds)

Ex. salt **NaCl**

(2) **nonmetal - nonmetal** (molecular compounds)

Ex. sulfur dioxide **SO₂**

(3) **metal - metal** (intermolecular compounds)

Ex. brass Cu - Zn

we will **not**
be studying
metal-metal

"tested"



Empirical Definitions

Ionic Compounds - solids at **SATP**

- when dissolved in water they conduct electricity

- no change in litmus paper

Molecular Compounds - solids, liquids and gases which, when dissolved in water, do not conduct electricity

- no change in litmus paper

ACIDS - when pure, resemble molecular substances

(can be solids, liquids or gases at SATP)

- in solution, their conductivity suggests a separate third class.

(do conduct electricity, but strength varies)

- in solution, make blue litmus turn **red**.

BASES - compounds whose aqueous solutions make red litmus turn **blue**.

FOUR STATES OF MATTER SUBSCRIPTS

(s) - solids

(l) - liquids

(g) - gases

(aq) - aqueous (dissolved in water)



Ex. H₂O_(l)

DIAGNOSTIC TESTS : [A] Conductivity Test
 [B] Litmus Test

Ionic Compounds

Formula unit - of an ionic compound is the smallest amount of the compound that has the composition given by the chemical formula.

Ex. one Na^+ and one Cl^- form **NaCl**

one atom!

Monatomic ions - single atoms that have gained or lost electrons

Ex. Na^+ or F^-

Binary ionic compounds - are composed of monatomic ions.

Ex. $\text{Na}^+ + \text{Cl}^- \rightarrow \text{NaCl}$

many atoms!

Polyatomic ion - a cation or anion that is composed of a group of atoms with a net positive or negative charge.

Ex. NO_3^-

(back of periodic table)

Multivalent ion - some atoms (transition elements) can form more than one ion, each with its own particular charge.

Ex. Fe^{+2} and Fe^{+3}

Hydrate - compounds that decompose at relatively low temperatures to yield water and another associated compound (usually ionic)

- the water is loosely held to the ionic compound.

Ex. $\text{Cu}^{2+}\text{SO}_4^{2-} \cdot 5\text{H}_2\text{O}$
 $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$

Anhydrous - the form of a hydrate with the water removed.

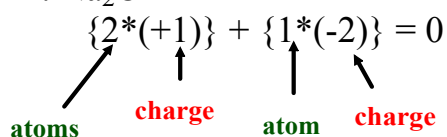
Ex. $\text{CuSO}_{4(s)}$

Ionic Formulas

"The net electrical charge in a theoretical chemical formula is zero"

Therefore the sum of the charges on the positive ions (cations) must equal the sum of the electrical charges on the negative ions (anions)

Ex. Na_2O



Exit Tickets

On the slip of paper provided,
please write one or two
sentences indicating what YOU
think was the most important
thing you learned or heard today.