



**LESSON 5**

## Chemical Nomenclature

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### Nomenclature (n) /'noʊ.men.kleɪ.tʃə/

- a system for naming things, especially in a particular area of science

→ = Terminology (n)

- Danh pháp

### Name of Elements

Elements already known retained their old names

- e.g. silver, tin, gold, mercury

newly discovered elements generally have their names ending in -um if they are metals, and -on if they are non-metals

- e.g. sodium, potassium, argon

### Binary (adj) /'baɪ.nə.i/

- consisting of two parts

Ex: binary compounds: compounds that are composed of two elements

- Gồm 2 phần

### Name of Compounds

Compounds of two elements: the name of the metal comes first, followed by that of the other element ended in -ide

- e.g. sodium chloride (NaCl), zinc oxide (ZnO), aluminum oxide (Al<sub>2</sub>O<sub>3</sub>)

When a metal forms two compounds with oxygen, the two oxides are distinguished by adding -ous and -ic to the Latin name of the metal, signifying the lower and higher oxidation states respectively

- e.g. cuprous oxide (Cu<sub>2</sub>O), cupric oxide (CuO), and ferrous oxide (FeO), ferric oxide (Fe<sub>2</sub>O<sub>3</sub>).

The salts corresponding to cuprous oxide are called cuprous salts

- e.g. cuprous chloride (CuCl) and cupric chloride (CuCl<sub>2</sub>)

### Distinguish between different compounds of the same element:

the use of the Greek prefixes

mono-, di-, tri-, tetra-, penta-, hexa-, hepta-, octo-

hemi- (= one half), and sesqui- (= one and a half), and per-

## Designate (v) /'dez.ɪg.neɪt/

**- to say officially that a place or thing has a particular character or purpose**

Ex: This area of the park has been specially designated for children.

**- to choose someone officially to do a particular job**

Ex: She has been designated to organize the meeting.

- Chỉ định

By the use of these prefixes we can designate the compounds more precisely than by means of the prefixes -ous and -ic, especially when more than two compounds exist

carbon monoxide (CO) and carbon dioxide (CO<sub>2</sub>)

phosphorus trichloride (PCl<sub>3</sub>) and phosphorus pentachloride (PCl<sub>5</sub>)

chromium sesquioxide (Cr<sub>2</sub>O<sub>3</sub>) and chromium trioxide (CrO<sub>3</sub>)

lead hemioxide (Pb<sub>2</sub>O)

hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>).

## Oxides

Oxides form salts with acids → basic oxides

Basic oxides combine with water → bases

Bases contain the metal united with the group of atoms -OH (the hydroxyl group) → hydroxides

- NaOH is sodium hydroxide
- Cu(OH)<sub>2</sub> is copper hydroxide
- Fe(OH)<sub>2</sub> is ferrous hydroxide
- Fe<sub>2</sub>O<sub>3</sub>·H<sub>2</sub>O is ferric hydroxide

**The endings -ous, -ic are also applied to acids**

the -ous acid containing less oxygen than the -ic acid

- sulfurous acid (H<sub>2</sub>SO<sub>3</sub>) and sulfuric acid (H<sub>2</sub>SO<sub>4</sub>)
- chlorous acid (HClO<sub>2</sub>) and chloric acid (HClO<sub>3</sub>)
- hypochlorous acid (HClO) and perchloric acid (HClO<sub>4</sub>)

Salts are named in relation to the acids from which they are derived according to the following rules:

1. If the name of the acid ends in -ous, the name of the salt ends in -ite, sodium chlorite, NaClO<sub>2</sub>.
2. If the name of the acid ends in -ic, the corresponding salt ends in -ate, sodium chlorate, (NaClO<sub>3</sub>).
3. If the name of the acid involves also a prefix such as per- or hypo-, the prefix is retained on the name of the salt, sodium hypochlorite (NaClO), and sodium perchlorate (NaClO<sub>4</sub>).

Accordingly, salts of sulfurous acid are called sulfites, those of sulfuric acid, sulfates. Salts of phosphorous acid are phosphites, of phosphoric acid, phosphates, etc.