GENERAL CHEMISTRY STANDARD 6.7

6.7: Determine the name of an acid from a formula and derive the formula of an acid from its name

DEFINITIONS

- **Acid:** Any compound that starts with a hydrogen atom
  - HCl – Hydrochloric Acid
  - H_2SO_4 – Sulfuric Acid
  - HNO_3 – Nitric Acid

NOMENCLATURE RULE 12

Option 1: If the anion is monatomic, then add the prefix "hydro-" to the stem of the anion and replace the ending with "-ic" and add the word acid

Examples:

HBr = Hydrobromic Acid **HI = Hydroiodic Acid** **HF = Hydrofluoric Acid**

Option 2: If the anion is polyatomic, name the stem of the anion and replace the ending with "-ic" if the polyatomic ion ends in "-ate" or replace the ending of the stem of the ion with "-ous" if the polyatomic ion ends in "-ite" and add the word acid

Examples:

H_2SO_4 = Sulfuric Acid **H_3PO_4 = Phosphoric Acid**

HNO_3 = Nitric Acid

NOMENCLATURE RULE 13

Option 1: If the name has the "hydro-" prefix, then the anion is monatomic and will have the number of hydrogen atoms equal to the oxidation number of the anion

Examples:

Hydrosulfuric Acid = H_2S
Hydrophosphoric Acid = H_3P
Hydrochloric Acid = HCl

Option 2: If there is no "hydro-" prefix, then the anion is a polyatomic ion. If the name ends with "-ic", then the polyatomic ion ends with "-ate". If the name ends with "-ous", then the polyatomic ion ends with "-ite". The number of hydrogen atoms present will equal the oxidation number of the polyatomic ion.

Examples:

Sulfurous Acid = HSO_3
Cyanic Acid = HCN
Nitrous Acid = HNO_2

EXAMPLES

- **Name the following acids:**
  - HNO_2
  - $HC_2H_3O_2$
  - $HClO_3$
  - HCN
  - H_2CO_3

EXAMPLES

- **Name the following acids:**
  - HNO_2 **Nitric Acid**
  - $HC_2H_3O_2$ **Acetic Acid**
  - $HClO_3$ **Chloric Acid**
  - HCN **Cyanic Acid**
  - H_2CO_3 **Carbonic Acid**
  - HBr **Hydrobromic Acid**
  - HI **Hydroiodic Acid**

EXAMPLES

- **Name the following acids:**
  - Sulfurous Acid
  - Oxalic Acid
  - Hydrochloric Acid

EXAMPLES

- **Name the following acids:**
  - Sulfurous Acid H_2SO_3
  - Oxalic Acid $H_2C_2O_4$
  - Hydrochloric Acid HCl