

Rules of Nomenclature

Binary Ionic (metal + nonmetal)	Binary Molecular (nonmetal + nonmetal)	Ternary Ionic (metal + polyatomic ion)	Acids (aqueous solutions)
<p>1) Name metal</p> <p>2) Use Roman numeral if metal has variable oxidation number</p> <p>3) Name non-metal</p> <p>4) Change ending of nonmetal to -ide</p> <p><u>Example:</u> LiF</p> <p>1) Li = lithium</p> <p>2) Group 1 metal, so no Roman numeral is needed</p> <p>3) F = fluorine</p> <p>4) Change ending to -ide → Lithium fluoride</p> <p><u>Example:</u> FeCl₃</p> <p>1) Fe = iron</p> <p>2) Use a Roman numeral to show charge on metal: Fe³⁺(Cl¹⁻)₃ → iron (III)</p> <p>3) Cl = chlor<u>ine</u></p> <p>4) Change ending to -ide → Iron (III) chloride</p> <p><u>Note:</u> No Roman numeral is required if the metal is: Group 1/IA (+1 charge) or Group 2/IIA (+2 charge) or Al³⁺ Zn²⁺ Cd²⁺ Ag¹⁺</p>	<p>1) Name first element</p> <p>2) Use number prefix to show number of atoms of first element (if only one atom, no prefix is used)</p> <p>3) Name second element</p> <p>4) Use number prefix to show number of atoms of second element</p> <p>5) Change ending of second element to -ide</p> <p><u>Prefixes:</u> 1=mono 6=hexa 2=di 7=hepta 3=tri 8=octa 4=tetra 9=nona 5=penta 10=deca</p> <p><u>Example:</u> N₂O₅</p> <p>1) N = nitrogen</p> <p>2) 2 atoms of nitrogen, so use prefix “di”</p> <p>3) O = oxyg<u>en</u></p> <p>4) 5 atoms of oxygen, so use prefix “pent(a)”</p> <p>5) Change ending of second element to -ide → Dinitrogen pentoxide</p> <p><u>Example:</u> CCl₄</p> <p>1) C = carbon</p> <p>2) Only one atom of carbon, so no prefix is used</p> <p>3) Cl = chlor<u>ine</u></p> <p>4) 4 atoms of chlorine, so use prefix “tetra”</p> <p>5) Change ending to -ide → Carbon tetrachloride</p>	<p>1) Name metal</p> <p>2) Use Roman numeral if metal has variable oxidation number</p> <p>3) Name polyatomic ion</p> <p><u>Example:</u> Na₂C₂O₄</p> <p>1) Na = sodium</p> <p>2) No Roman numeral needed</p> <p>3) C₂O₄²⁻ = Oxalate → Sodium oxalate</p> <p><u>Example:</u> Cu(NO₃)₂</p> <p>1) Cu = copper</p> <p>2) Use a Roman numeral to show charge on metal: Cu²⁺(NO₃¹⁻)₂ → Copper(II)</p> <p>3) NO₃¹⁻ = nitrate → Copper (II) nitrate</p> <p>Note for group 7 elements: Per-(<u> </u>)-ate (ClO₄⁻ perchlorate) (<u> </u>)-ate (ClO₃⁻ chlorate) (<u> </u>)-ite (ClO₂⁻ chlorite) Hypo-(<u> </u>)-ite (ClO⁻ hypochlorite) -ide (Cl⁻ chloride)</p> <p>Cl can be replaced with other halogens from Group VII (F, Br, I) Ex: BrO₄⁻ perbromate</p> <p><u>Note:</u> No Roman numeral is required if the metal is: Group 1/IA (+1 charge) or Group 2/IIA (+2 charge) or Al³⁺ Zn²⁺ Cd²⁺ Ag¹⁺</p>	<p>Binary Acids (hydrogen + nonmetal)</p> <p>1) All binary acids start with the prefix “hydro”</p> <p>2) Name nonmetal</p> <p>3) Change ending to -ic</p> <p>4) Add the word “acid”</p> <p><u>Example:</u> HF (aq)</p> <p>1) Only 2 elements = binary acid, so use the prefix “hydro”</p> <p>2) F = fluor<u>ine</u></p> <p>3) Change ending to -ic → Hydrofluoric acid</p> <p>Ternary Acids (hydrogen + polyatomic ion)</p> <p>1) Skip over the hydrogen(s)</p> <p>2) Name polyatomic ion</p> <p>3) Change ending: <u>ate</u> → ic <u>ite</u> → ous</p> <p>4) Add the word “acid”</p> <p><u>Example:</u> H₂CO₃ (aq)</p> <p>1) Skip over the hydrogens</p> <p>2) CO₃²⁻ = carbon<u>ate</u></p> <p>3) Change -ate to -ic</p> <p>4) Add the word “acid” → Carbonic acid</p> <p><u>Example:</u> HClO (aq)</p> <p>1) Don’t name hydrogen</p> <p>2) ClO¹⁻ = hypochlor<u>ite</u></p> <p>3) Change -ite to -ous</p> <p>4) Add the word “acid” → Hypochlorous acid</p>

Nomenclature Flow Chart

