

Chemistry 101L

Experiment A

The Language of Chemistry: Chemical Nomenclature

Nomenclature Types

Common (trivial)

- Typically used
- Straight memorization
- May not indicate what elements are present
- Many slight differences

IUPAC

- Easy
- Follows specific rules
- Identifies the specific elements which are present
- Clear-cut definitions

Binary Covalent Compounds

- First element is the most electro positive
- The last element loses it's ending
- The last element has -ide added to it's ending
- Quantities of the elements uses Greek prefixes

(1) mono	(6) hexa
(2) di	(7) hepta
(3) tri	(8) octa
(4) tetra	(9) nona
(5) penta	(10) deca

Ionic Compounds

- Metal Cations with variable charges have the charge listed after the metal.
 - Not group I, II and III
- Older, nonsystematic convention for cations
 - -ous for lower charge
 - -ic for higher charge

Polyatomic oxoanions

- Ions with the -ite ending have one fewer oxygen atom than the ions with the -ate ending
- The hypo-ite anions have one fewer oxygen atom than the corresponding -ite anion
- The per-ate anions have one more oxygen atom than the corresponding -ate anion
 - The prefix per- is a truncation of (hy)per, (hyper means "higher")

Polyatomics

OH⁻ hydroxide O₂²⁻ peroxide CN⁻ cyanide

NH₂⁻ amide N₃⁻ azide I₃⁻ triiodide

Group III (13)

BO₃⁻ borate

Group IV (14)

CO₃²⁻ carbonate

HCO₃²⁻ hydrogen carbonate
(or bicarbonate)

CH₃CO₂⁻ acetate

OCN⁻ cyanate

SCN⁻ thiocyanate

Group VII (17)

ClO⁻ hypochlorite

ClO₂⁻ chlorite

ClO₃⁻ chlorate

ClO₄⁻ perchlorate

Transition metal oxoanions (6, 7)

CrO₄²⁻ chromate

Cr₂O₇²⁻ dichromate

MnO₄⁻ permanganate

Group V (15)

NO₂⁻ nitrite

NO₃⁻ nitrate

PO₄³⁻ phosphate

HPO₄²⁻ hydrogen phosphate

H₂PO₄⁻ dihydrogen phosphate

AsO₃³⁻ arsenite

AsO₄³⁻ arsenate

Group VI (16)

SO₃²⁻ sulfite

SO₄²⁻ sulfate

HSO₄⁻ hydrogen sulfate
(or bisulfate)

S₂O₃²⁻ thiosulfate

Hydrated Ionic Compounds

- Add the Greek prefix and then hydrate

Acids

- The -ide anions form acids with the naming structure hydro-ic acid
- The -ate anions (including the per-ates) form acids with the naming structure hydro-ic acid
- The -ite anions (including the hypo-ites) form acids with the naming structure hydro-ous acid

See Your Lab Manual For Examples

- Water
- Ammonia
- Ammonium