

CHM1025 Review Topics Module 8:

1. Oxidation numbers:

- a. The sum of the oxidation numbers for a compound is 0 and for a polyatomic ion is the charge.
- b. O is -2 except in peroxides (-1)
- c. F is -1, other halogens are -1 except when bonded to a more EN atom.
- d. H is +1 when bonded to a nonmetal (more common), or -1 when bonded to a metal (ionic compound).
- e. Group IA is +1, IIA is +2, Al is +3, Ag is +1, Zn and Cd are +2.
- g. Elements by themselves (even if diatomic or polyatomic have an oxidation number of 0).

2. Naming binary covalent compounds. Use prefixes. Name of first element plus name of second element with -ide ending. Omit prefix if first element is 1.

3. Naming ionic compounds:

- a. Binary with fixed metal (see 1e above) plus nonmetal. Name of metal plus name of nonmetal with -ide ending.
- b. Binary with variable charge metal plus nonmetal. Add a roman numeral to indicate charge of metal.
- d. Ternary with fixed charge metal or ammonium plus polyatomic anion. Name of metal plus name of nonmetal with ending -ide
- e. Ternary with variable charge metal plus polyatomic anion. Add roman numeral to indicate charge of metal.

4. To name the polyatomic anions know the T the 4 and the 3 rules. These indicate the number of oxygens with a nonmetal for -ate ending. One less O changes ending to -ite. Two less adds prefix hypo- to the -ite ending name. One more adds prefix per- to -ate ending.

In addition know the polyatomic ions:

acetate, oxalate, cyanide, hydroxide (bases), thiocyanate, cyanide, permanganate, chromate, and dichromate, peroxide, ammonium.

5. Know that mercury I and peroxide are dimers. You never simplify formulas for covalent compounds but for ionic you usually do except for mercury I and peroxide that must remain with the subscript of 2.

6. Remember that to come up with a formula of an ionic compound you place the ions with charge side by side and you criss cross the charges and then simplify except as indicated in 5 for the dimers.

7. Naming acids:

a. Binary acids of H (consider as H⁺) plus a nonmetal (only F, Cl, Br, I, S and Se). If in gas form name as ionic compound (no prefix)

b. Binary acids if dissolved in water add prefix hydro, change root of nonmetal name to end in -ic and add the word acid to name.

c. Ternary acids-Take polyatomic ion name and change ending of -ate to -ic and of -ite to -ous followed by the word acid.