Naming Compounds: **Test yourself**. Provide a name for each compound:

1) N_2O_4 _____

2) CO _____

3) H_2O _____

4) C_2H_6 _____

5) NaCl _____

6) $CaCl_2$ _____

7) CuBr _____

8) $Fe_2(SO_4)_3$ _____

9) $LiClO_4$ _____

10) $CuCl \cdot 6H_2O$ _____

11) NH_4OH _____

12) $HCl(g)$ _____

13) $HCl(aq)$ _____

14) $HNO_3(aq)$ _____

15) $H_2SO_3(aq)$ _____

Answers and explanations:

1) dinitrogen tetroxide: *first part is the name of the element, second part is the second element root ending with "–ide"; A space is required between the two parts. A covalent compound (made from nonmetal) always required the greek prefix to tell the number of atoms of each type in a compound*. 2) carbon monoxide: *the prefix "mono" is never used for the first atom.* 3) water: *some compound are widely used in chemistry, in this case, they have a common name (NH_3 = ammonia, CH_4 = methane, etc.)*. 4) ethane. 5) sodium chloride: *ionic compound are made from a metal (here Na) and a non metal (Cl), the cation is named first. greek prefix are never used in ionic compounds since the ratio of Na^+ and Cl^- is known by simply balancing the charges*. 6) Calcium chloride: *Ca^{+2} request 2 Cl^- ions to keep its electroneutrality*. 7) Copper(I) bromide: *Copper is a transition element that can get several oxidation states like Cu^+ or Cu^{2+}. In this case, the oxidation state should be indicated with a roman number within parentheses.* 8) Iron(III) sulfate: *Since the total charge brought by the three sulfates is –2x3 = -6, then each of the two irons should have +3 charge to neutralize the comple.g.* 9) Lithium perchlorate*: the perchlorate is an oxyanion based on chlorine, from the halogen group (family of 4 oxyanions, charge –1)*. 10) Copper(I) chloride hexahydrate: *We use the greek prefix followed by the word "hydrate" to count the number of water molecules in the compound.* 11) Ammonium hydroxide: *No metal here but it is an ionic compound since it is made of two polyatomic ions. Positive ion or cation always named first*. 12) Hydrogen chloride 13) hydrochloric acid*: the compound here is the same than (12) but it now in its acid form in water or in an aqueous state (aq.). To name an acid made from a compound having a anion without oxygen, the prefix "hydro-" to the root of the anion followed by "–ic acid" is used.* 14) nitric acid: *When the anion have oxygen (here nitrate), the prefix "hydro" is not used. The termination of the anion name will change from "ate" to "ic" or from "ite" to "ous" also ending with acid*. 15) Sulfurous acid: *Since the anion name is "sulfite", the acid form will become "-ous acid".*