

## CHEM 1305 - Chapter 05 - Handout

*Define the following terms; explain the following concepts, and answer the following questions:*

- 1) For nomenclature purposes, Binary Ionic Compounds are segregated into three class. Name and describe each:
  - a) Type I
  - b) Type II
  - c) Type III
- 2) Type III compounds involve only NON-METALS, whereas Type I and II compounds each contain at least one METAL.
- 3) Do the following (Y / N) involve the use of prefixes such as mono-, di-, tri-, tetra-, penta-, hexa-, ect.?
  - a) Type I - NO
  - b) Type II - NO
  - c) Type III - YES
- 4) Charged entities composed of several atoms bound together, such as  $\text{NH}_4^+$  and  $\text{NO}_3^-$ , are referred to as POLYATOMIC IONS.
- 5) In this course, we will only consider one polyatomic cation: AMMONIUM.
- 6) Polyatomic anions comprised of an atom of a given element and different numbers of oxygen atoms (e.g.,  $\text{ClO}_3^-$ ,  $\text{SO}_4^{2-}$ ,  $\text{PO}_4^{3-}$ ) are called OXYANIONS.
- 7) When naming an acid, it is best to place the acid in one of two categories: those that contain OXYGEN, and those that do not contain OXYGEN.
- 8) Acids in which oxygen is NOT present typically start with the prefix HYDRO-, end with the suffix -IC, followed by the word ACID.
- 9) \*\* Acids containing oxygen will have one of four prefix/suffix combinations, followed by the word ACID. Name the suffixes below, and write the word in the blank above.
  - a) PER- ? -IC
  - b) ? -IC
  - c) ? -OUS
  - d) HYPO- ? -IC ACID

10) Oxygen-containing “ic” acids can be thought of as being produced from “-ATE” polyatomic anions; and “ous” acids from “-ITE” polyatomic anions.

11) Name each of the following compounds:

- a) KCl - potassium chloride [Type I]
- b) ZnS - zinc sulfide [Type I]
- c) SnBr<sub>4</sub> - tin (IV) bromide [Type II]
- d) PbS - lead (II) sulfide [Type II]
- e) CO - carbon monoxide [Type III]
- f) Li<sub>2</sub>O - lithium oxide [Type I]
- g) HF - hydrofluoric acid [non-oxygen acid]
- h) SiO<sub>2</sub> - silicon dioxide [Type III]
- i) FeCl<sub>3</sub> - iron (III) chloride [~~Type III~~] Type II
- j) CuO - copper (II) oxide [~~Type III~~] Type II
- k) AsF<sub>3</sub> - arsenic fluoride [Type III]
- l) HNO<sub>3</sub> - nitric acid [oxy acid]
- m) AgCl - silver chloride [Type I]
- n) P<sub>2</sub>O<sub>5</sub> - diphosphorous pentoxide [Type III]
- o) H<sub>2</sub>SO<sub>4</sub> - sulfuric acid [oxy acid]
- p) H<sub>2</sub>SO<sub>3</sub> - sulfurous acid [oxy acid]

12) Write the formula for the following compounds:

- a) hydrosulfuric acid - HF
- b) sodium nitrate - NaNO<sub>3</sub>
- c) sodium chloride - NaCl
- d) carbon disulfide - CS<sub>2</sub>
- e) hydrobromic acid - HBr
- f) antimony (III) oxide - Sb<sub>2</sub>O<sub>3</sub>
- g) cobalt (II) perchlorate - Co(ClO<sub>4</sub>)<sub>2</sub>
- h) carbon disulfide - CS<sub>2</sub>
- i) sulfur dioxide - SO<sub>2</sub>
- j) water - H<sub>2</sub>O
- k) carbon tetrafluoride - CF<sub>4</sub>
- l) sulfuric acid - H<sub>2</sub>SO<sub>4</sub>