

CHM 101 Chapter 5 Study Guide / Learning Objectives

Chapter 5 in your textbook deals primarily with what we call nomenclature. In short, you have to know how to name a chemical compound given its formula, and you have to know how to get a compound's chemical formula given its name. In a sense, this is like learning vocabulary in a foreign language course. You need to understand nomenclature to be able to carry on a conversation about chemicals and chemistry.

After reading Chapter 5 and your class notes, you should be able to:

[Terminology]

- Define terms related to chemical compounds: **ionic compound, monatomic ion, cation, anion, polyatomic ion, chemical formula, molecular compound, binary molecular compound, acid, binary acid, oxyacid.**

[Ionic compounds]

- Distinguish, given either the compound's formula or the species it contains, whether a compound is molecular or ionic.
- Describe which elements form cations and which elements form anions.
- Determine the charge on a monatomic main-group (i.e. non transition metal) ion using only a periodic table.
- Find formulas or names for the common polyatomic ions using the polyatomic ion chart. There is a chart of the most common polyatomic ions on the course web site. (By the end of the course, you will remember the names and formulas of the most common polyatomic ions without needing the chart.)
- Determine the charge on a transition metal ion based on what it is connected to in an ionic compound. (example: What is the charge on Cu in the compound CuO?)

[Molecular compounds]

- Describe differences between molecular and ionic compounds in terms of properties (melting point, etc.) and chemical makeup.

[Nomenclature of ionic compounds]

- Name ionic compounds given their formulas. You should be able to name compounds with no other references than a periodic table and a polyatomic ion chart.
- Write the formulas of ionic compounds given their names. Again, you should be able to do this using only the periodic table and a polyatomic ion chart.

[Nomenclature of molecular compounds]

- Name molecular compounds given their formulas. (You may already be familiar with most of the Greek prefixes used for binary molecular compounds, but there will be a chart of Greek prefixes available on tests for you to use.)
- Write the formulas of molecular compounds given their names.

[Acids]

- Distinguish acids from other compounds based on their chemical formulas.
- Name a binary molecular acid (H + Group VIIA) given its formula.
- Write the formula of a binary molecular acid given its name.
- Name an oxyacid (H + polyatomic ion) given its formula.
- Write the formula of an oxyacid given its name.

[Polyatomic ions]

- Familiarize yourself with the polyatomic ion charts in the textbook and on the web site, so that you can quickly find the name or formula of each of the common polyatomic ions.
- By the end of the course, you should be able to give the names and formulas of these ions without using the chart.

[Practice]

- Practice nomenclature until you are comfortable with it. Flowcharts for naming different classes of compounds are available on the web site and should help you to get started. You need to be proficient in writing names and formulas for ionic compounds, binary molecular compounds, and acids well before the test. Practice until you can name compounds and write formulas for compounds using only a periodic table, the ion chart, and the knowledge inside your head.
- (p106a-106f) Q&P 10, 12, 14, 18, 20, 22, 36, 40, 44, 46, 50, 58, 92