Name:

Skill Sheet 19-C Naming Chemical Compounds

Compounds have unique names that identify them for us when we study chemical properties and changes. Predicting the name of a compound is fairly easy provided certain rules are kept in mind. In this skill sheet, you will practice naming a variety of chemical compounds.

1. Chemical formulas and compound names

Chemical formulas tell a great deal of information about a compound—the types of elements forming the compound, the numbers of atoms of each element in one molecule, and even some indication, perhaps, of the arrangement of the atoms when they form the molecule.

In addition to having a unique chemical formula, each compound has a unique name. These names provide scientists with valuable information. Just like chemical formulas, chemical names tell which elements form the compound. However, the names may also identify a "family" or group to which the compound belongs. It is useful for scientists, therefore, to recognize and understand both a compound's formula and its name.

2. Naming compounds

Naming ionic compounds is relatively simple, especially if the compound is formed only from monoatomic ions. Follow these steps:

1. Write the name of the first element or the positive ion of the compound.
2. Write the root of the second element or negative ion of the compound.
   For example, write *fluor-* to represent fluorine, *chlor-* to represent chlorine.
3. Replace the ending of the negative ion's name with the suffix *-ide*.
   Fluorine → Fluoride; Chlorine → Chloride

Examples:

A compound containing potassium (K^{1+}) and iodine (I^{1-}) would be named potassium iodide. Lithium (Li^{1+}) combined with sulfur (S^{2-}) would be named lithium sulfide.

Naming compounds that contain polyatomic ions is even easier. Just follow these two steps:

1. Write the name of the positive ion first. Use the periodic table or an ion chart to find the name.
2. Write the name of the negative ion second. Again, use the periodic table or an ion chart to find the name.

Examples:

A compound containing aluminum (Al^{1+}) and sulfate (SO_4^{2-}) would be called aluminum sulfate.

A compound containing magnesium (Mg^{2+}) and carbonate (CO_3^{2-}) would be called magnesium carbonate.

3. Practice writing compound names

Predict the name of the compound formed from the reaction between the following elements and/or polyatomic ions. Use the periodic table and the polyatomic ion chart in section 19.2 of your student text to help you name the ions.

Combination	Compound Name
Al + Br	
Be + O	
K + N	
Ba + CrO_4^{2-}	
Cs + F	
NH_3^{1+} + S	
Mg + Cl	
B + I	
Na + SO_4^{2-}	
Si + $C_2H_3O_2^{1-}$	

4. Extension: Families of chemical compounds

Certain compounds have common characteristics, so we place them into groups or families. The The group called "enzymes" contains thousands of representative chemicals, but all share certain critical features that allow them to be placed into this group. Often, the name of a compound identifies the family of chemical to which it belongs. The clue is usually found in the suffix for the compound's name. The table below lists suffixes for some common chemical families.

Chemical Family	Suffix
Sugars	*-ose*
Alcohols	*-ol*
Enzymes	*-ase*
Ketones	*-one*
Organic acids	*-oic* or *-ic* acid
Alkanes	*-ane*

Glucose, the compound used by your brain as its primary fuel, is a sugar. The suffix *-ose* indicates its membership in the sugar family. Propane, the compound used to operate your gas barbecue grill, is an alkane, a compound formed from carbon and hydrogen atoms that are covalently bonded with single pairs of electrons. We know this from the suffix *-ane*.

Knowing such information about a compound can be very useful when you are reading the labels of consumer products. Compound names can be found in the ingredients list on the label. If you are purchasing a hand lotion to alleviate dry skin, you should avoid one that lists a compound with an *-ol* suffix early in the ingredients list.

The ingredients are listed from largest amount to smallest amount. The earlier a compound is listed, the greater the amount of that compound in the product. A compound with an *-ol* suffix is an alcohol. Hand lotions with high percentages of alcohols are less effective since alcohols tend to dry out rather than moisturize the skin!

In later chemistry courses, you will learn more about the names and characteristics of "families" of compounds. This knowledge will provide you with a powerful tool for making informed consumer decisions.

5. Practice predicting family identities of compounds

Using the information in the table on the previous page to predict the chemical family to which the following compounds are members:

Compound Name	Chemical Family
Lipase	
Methanol	
Formic Acid	
Butane	
Sucrose	
Acetone	
Acetic Acid	