

A Short Review of Covalent and Ionic Compounds

An ionic compound is a compound that is composed of ions. The positive ions are metals, that lose one or more electrons, and the negative ions are nonmetals or polyatomic ions composed of several nonmetals which gain one or more electrons. The ions combine in the simplest manner that allows the compound formed to be neutral.

Please review the handout on naming ionic compounds.

A covalent (or molecular compound) is composed of two or more nonmetals. Electrons are shared in these compounds. Prefixes are included in the names of these compounds to signify the number of each type of atom present in the compound.

The prefixes are:

mono – 1	hexa-6
di -2	hepta-7
tri-3	octa-8
tetra-4	nona-9
penta-5	deca-10

If there is only one atom of the first element in the compound formula we do not use the prefix mono, but if there is only one atom of the second element in the compound we do.

If there is more than 1 atom of any element in the formula, we always use the appropriate prefix.

Here are a few examples of covalent compounds:

CO ₂	Carbon dioxide
CO	Carbon monoxide
H ₂ O	Dihydrogen monoxide
CCl ₄	carbon tetrachloride
P ₂ O ₅	diphosphorus pentoxide

We often draw Lewis structures for covalent compounds in order to understand more about their polarity and their geometry.

Now that you have a little background information, use this knowledge, and perhaps your text book to help you with the following practice problems.

1. On a separate sheet of paper, draw Lewis structures for the following compounds:

H_2O , NH_3 , CH_4 and CH_3Cl

2. Write the definitions for the following terms:

covalent bond, ionic bond, polar bond, polar molecule, nonpolar bond, nonpolar molecule.

3. Identify each of the following as either a covalent or an ionic compound and write the correct compound name for each.

SO_3

CaCl_2

KI

CO

N_2O_5

Na_2S

PCl_3

AlPO_4

MgO

P_2O_4

CaCO_3

List three more ionic compounds and write correct formulas for each. List three more covalent compounds and write correct formulas for each.