

In the previous NS's you learned a whole set of rules for naming ionic compounds – those compounds made of metals with nonmetals.

There are different rules used to name *molecular* compounds – the compounds made of only nonmetals.

- Since molecular formulas do not contain ions, and can combine in such a wide variety of ratios (compared to ionic compounds), a different method of determining the subscripts must be used.

First it is critical that you can identify a compound as being ionic or molecular.

- When faced with naming or writing compounds it is important to first identify if the compound is ionic or molecular. Having done that, you can use the NS E2, E3, E4, and E5, for writing and naming ionic compounds, and this NS E6 for writing and naming binary molecular compounds.

Method of Naming Binary Molecular Compounds

The term binary means – involving two elements. Thus a molecular compound is made of two (only two, and not three) different nonmetals. We will not learn any systematic method of naming molecular compounds with more than two different elements. Instead, we will refer to them by their common names, like sugar $C_6H_{12}O_6$

The first element listed retains the same name, and the second element changes its ending into ____ - ide

There is no need to consider any charge since when nonmetals bond with other nonmetals, electrons are shared, and no ions are formed. Instead, prefixes are used to indicate the subscript attached to the element.

- | | | | |
|-----|--|------|--------|
| • 1 | mono- | • 5 | penta- |
| | → this prefix may or may not be used for the second element (and not usually used for the first element) | • 6 | hexa- |
| • 2 | di- | • 7 | hepta- |
| • 3 | tri- | • 8 | octo- |
| • 4 | tetra- | • 9 | nono- |
| | | • 10 | deca- |

For example

carbon <u>mon</u> oxide	CO
<u>d</u> initrogen sulfide	N ₂ S
carbon <u>d</u> ioxide	CO ₂
<u>dis</u> ulfur <u>pent</u> oxide	S ₂ O ₅

- You can see that sometimes the mono- is used for the second element, and other times not,
- (carbon monoxide and dinitrogen sulfide) you can choose which you prefer.
- You can see that the prefixes are sometimes modified to make the name smoother. (mono oxide = monoxide)

Acids (Compounds that sit the fence between ionic and covalent)

Acids are compounds that are molecular in make-up (made of nonmetals with covalent bonds), but when put into water, they separate into ions, thus behaving like ionic compounds.

Note that all the acids are made of **H + anion**.

Why are there varying numbers of hydrogens?

Since hydrogen can carry a +1 charge, the number of hydrogens must match the charge of the negative ion

HCl	hydrochloric acid
H ₂ SO ₄	sulfuric acid
HNO ₃	nitric acid
HC ₂ H ₃ O ₂ (or CH ₃ COOH)	acetic acid
H ₃ PO ₄	phosphoric acid
H ₂ CO ₃	carbonic acid

Use the scheme for naming acids on the back of the chart.

NS E5 (pg 2 of 3) Naming Molecular Compounds including Acids



