

CHEMISTRY

FORMULA TO NAME (Binary) PRACTICE

Binary Compounds of Two Nonmetals

The Greek System

A binary compound is one made of two different elements. There can be one of each element such as in CO or NO. There can also be several of each element such as BF₃ or OCl₂.

This lesson shows you how to name binary compounds from the formula when two nonmetals are involved. The four formulas above are all examples of this type. Important point to remember: NO metals (which act as the cation) are involved. That means one of the nonmetals will be acting in the positive role while the other is negative.

In fact, you do not even need to know the charges, since the formula comes right from the element names and their prefixes. Be aware that heavy use of Greek number prefixes are used in this lesson. Here are the first ten:

one	mono-	six	hexa-
two	di-	seven	hepta-
three	tri-	eight	octa-
four	tetra-	nine	nona-
five	penta-	ten	deca-

Example #1 - write the name for **N₂O**.

Example #2 - write the name for **NO₂**.

Step #1 - part of the first name is the unchanged name of the first element in the formula. In the examples above, it would be nitrogen.

If the subscript of the first element is 2 or more, you add a prefix to the name. In the first example above, you would write dinitrogen. If the subscript is one as in the second example above, you DO NOT use a prefix. You simply write the name, in this example it would be nitrogen.

Step #2 - the anion is named in the usual manner of stem plus "ide." In addition, a prefix is added. In the first example, the prefix is "mono-" since there is one oxygen. In the second example, use "di-" because of two oxygens.

The correct names of the two examples are dinitrogen monoxide and nitrogen dioxide.

Note that "monoxide" is written rather than "monooxide." It sounds better when spoken out loud.

Example #3 - write the name for **IF₇**.

Step #1 - the first element is iodine and there is only one. This part of the name will be "iodine", NOT "monoiodine."

Step #2 - the second element is fluorine, so "fluoride" is used. Since there are seven, the prefix "hepta" is used.

The name of this compound is iodine heptafluoride.

Example #4 - write the name for **N₂O₅**.

Step #1 - the first element is nitrogen and there are two. This part of the name will be "dinitrogen."

Step #2 - the second element is oxygen, so "oxide" is used. Since there are five, the prefix "penta" is used.

The name of this compound is "dinitrogen pentaoxide." Many write it as "dinitrogen pentoxide."

Example #5 - write the name for **XeF₂**.

The first part of the name comes from the first element's name: xenon. Since there is only one atom present, no prefix is used.

The second part of the name comes from the root of the second symbol plus 'ide' as well as the prefix "di-," therefore di + fluor + ide = difluoride.

This compound is named xenon difluoride.

Example #6 - write the name for **N₂O₄**.

The first part of the name comes from the first element's name: nitrogen. Since there are two atoms, the prefix "di-" is used giving dinitrogen.

The second part of the name comes from the root of the second symbol plus 'ide' as well as the prefix "tetra-," therefore tetr + ox + ide = tetroxide.

This compound is named dinitrogen tetroxide. Notice the dropping of the "a" in tetra.

Just a reminder: this system of naming does not really have an officially accepted name, but is often called the Greek system (or method). It involves use of Greek prefixes when naming binary compounds of two nonmetals.

CHEMISTRY

FORMULA TO NAME (Binary) PRACTICE

Sometimes you will see the Stock system applied to these types of compounds. Here is what the IUPAC currently says about that practice: "The Stock notation can be applied to both cations and anions, but preferably should not be applied to compounds between nonmetals."

Practice Problems

Write the correct name for:

