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CHEMISTRY

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Naming & Writing Formulas for Binary Compounds of Two Non-Metals

The system of naming binary compounds of **TWO (2) NON-METALS** does not really have an officially accepted name, but it is often called the Greek system (or method). It involves use of Greek prefixes when naming binary compounds formed between two nonmetals.

Sometimes you will see the Stock system (using roman numerals i.e. lead(IV) bromide) applied to these types of compounds. Here is what the IUPAC (International Union of Pure and Applied Chemistry) 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." The chart on the right lists each number and its Greek prefix.

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

Part I: How to name a binary compound of two non-metals.

Lets try one. Write the name for N_2O_5

Description of Action	Action & Explanation
1. Use the chart labeled "Covalent Prefixes" from the back of your periodic table and identify the prefix that corresponds to the subscript following the first symbol. NEVER USE THE PREFIX MONO- BEFORE THE FIRST ELEMENT NAME!	1. di There are 2 nitrogen so we have to use the prefix "di-".
2. Add the name of the first element to the end of the prefix.	2. dinitrogen
3. Write the prefix for the subscript that follows the second element. You must leave a space between the first name and the second name.	3. dinitrogen penta There are 5 oxygen so we must use the prefix penta.
4. Attach the root name of the second element to the second prefix.	4. dinitrogen pentaox
5. Add "-ide" to the end of the second element's root name.	5. dinitrogen pentaoxide

Part II: How to write the formula for a binary compound of two non-metals.

Lets write the formula for dinitrogen trioxide.

Description of Action	Action & Explanation
1. Look at the first name of the compound. Identify the element name. Write the symbol for this element.	1. N In dinitrogen, the elements name is nitrogen. Nitrogen's symbol is N.
2. If the first name of the compound has a prefix, write the number the prefix refers to as the symbol's subscript.	2. N_2 We have dinitrogen. "Di-" means two, so I wrote a two after N.
3. Look at the second name of the compound and identify the element root name. Write the symbol for the root name.	3. N_2O The second name of this compound is trioxide. There is an "ox-" in there! "Ox" refers to oxygen. Oxygen's symbol is O. So, I wrote that O that you see above.
4. Determine the number that the prefix of the second name refers to and write this number as the second symbol's subscript. (Say that fast 5 times!!!)	4. N_2O_3 The second name is trioxide. "Tri-" means 3. So, I wrote a 3 after the O.

Homework:**Part I: Name the following.**

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|---|---|--|
| 1. KrF ₂
krypton difluoride | 2. BrF ₅
bromine pentafluoride | 3. SCl ₄
sulfur tetrachloride |
| 4. H ₂ O
dihydrogen monoxide | 5. NI ₃
nitrogen triiodide | 6. SF ₆
sulfur hexafluoride |
| 7. XeF ₄
xenon tetrafluoride | 8. PCl ₃
phosphorus trichloride | 9. CO
carbon monoxide |
| 10. PCl ₅
phosphorus pentachloride | 11. P ₂ O ₅
diphosphorus pentaoxide | 12. S ₂ Cl ₂
disulfur dichloride |
| 13. ICl ₂
iodine dichloride | 14. SO ₂
sulfur dioxide | 15. P ₄ O ₁₀
tetraphosphorus decaoxide |
| 16. N ₂ O
dinitrogen monoxide | 17. OF ₂
oxygen difluoride | 18. ClO ₂
chlorine dioxide |
| 19. SiO ₂
silicon dioxide | 20. BF ₃
boron trifluoride | 21. N ₂ S ₅
dinitrogen pentasulfide |
| 22. CO ₂
carbon dioxide | 23. SO ₃
sulfur trioxide | 24. XeF ₆
xenon hexafluoride |

Part II: Write the formulas for each of the following.

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| 1. chlorine monoxide
ClO | 2. oxygen difluoride
OF₂ | 3. boron triphosphide
BP₃ |
| 4. dinitrogen trioxide
N₂O₃ | 5. nitrogen trifluoride
NF₃ | 6. sulfur tetrachloride
SCl₄ |
| 7. xenon trioxide
XeO₃ | 8. carbon dioxide
CO₂ | 9. diphosphorus pentoxide
P₂O₅ |
| 10. phosphorous trichloride
PCl₃ | 11. sulfur dioxide
SO₂ | 12. bromine pentafluoride
BrF₅ |
| 13. disulfur dichloride
S₂Cl₂ | 14. boron trifluoride
BF₃ | 15. nitrogen monoxide
NO |
| 16. silicon tetrachloride
SiCl₄ | 17. krypton difluoride
KrF₂ | 18. fluorine monoxide
FO |
| 19. silicon dioxide
SiO₂ | 20. boron trichloride
BCl₃ | 21. dinitrogen pentasulfide
N₂S₅ |