

Naming Molecular Compounds

Chem Worksheet 9-2

Name _____

A **molecular compound** is a group of atoms held together by a covalent bond. Compounds made entirely of non-metals are generally molecular compounds. Carbon tetrachloride, CCl_4 , is an example of a molecular compound. When naming these compounds prefixes are used to denote how many of each atom is bonded in the compound. However, the prefix *mono-* is not used with the first element in the compound, even if there is only one element. The ending of the second element in the compound is always changed to *-ide*, in the same way the ending is changed for monatomic anions.

Rules for naming Molecular Compounds

1. Name the first element using the element's full name.
2. Name the second element using the *-ide* ending.
3. Use prefixes to tell how many of each element is present. (do not use the prefix *mono-* on the first element).

Naming Prefixes

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

Examples

#1. Write the chemical formula for diphosphorus pentoxide

- this compound contains two phosphorus atoms and five oxygen atoms:



#2. Name the following compound: IF_7 .

- there is one iodine and there are seven fluorine atoms:

iodine heptafluoride

(the prefix *mono-* is not used on the first element and that the ending of fluorine is changed to *-ide*.)

Fill in the following table with the missing information.

| | Formula | Name |
|-----|---------------------------|--------------------|
| 1. | SO_2 | |
| 2. | | Sulfur trioxide |
| 3. | N_2O_4 | |
| 4. | | Chlorine dioxide |
| 5. | P_4O_{10} | |
| 6. | | Carbon disulfide |
| 7. | NO_2 | |
| 8. | N_2Cl_4 | |
| 9. | | Xenon difluoride |
| 10. | S_2Cl_2 | |
| 11. | | Iodine trichloride |
| 12. | P_2S_5 | |

| | Formula | Name |
|-----|----------------------|-----------------------------|
| 13. | SF_6 | |
| 14. | | Tetraphosphorus hexasulfide |
| 15. | SeO_2 | |
| 16. | | Ammonia |
| 17. | | Boron trichloride |
| 18. | N_2O | |
| 19. | BrF_5 | |
| 20. | | Carbon dioxide |
| 21. | | Carbon monoxide |
| 22. | ClF_3 | |
| 23. | | Iodine monochloride |
| 24. | CH_4 | |

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Fill in the following table with the missing information.

| | Formula | Name |
|-----|---------------------------|---------------------------|
| 1. | SO_2 | sulfur dioxide |
| 2. | SO_3 | Sulfur trioxide |
| 3. | N_2O_4 | dinitrogen tetroxide |
| 4. | ClO_2 | Chlorine dioxide |
| 5. | P_4O_{10} | tetraphosphorus decoxide |
| 6. | CS_2 | Carbon disulfide |
| 7. | NO_2 | nitrogen dioxide |
| 8. | N_2Cl_4 | dinitrogen tetrachloride |
| 9. | XeF_2 | Xenon difluoride |
| 10. | S_2Cl_2 | disulfur dichloride |
| 11. | ICl_3 | Iodine trichloride |
| 12. | P_2S_5 | diphosphorus pentasulfide |

| | Formula | Name |
|-----|------------------------|-----------------------------|
| 13. | SF_6 | sulfur hexafluoride |
| 14. | P_4S_6 | Tetraphosphorus hexasulfide |
| 15. | SeO_2 | selenium dioxide |
| 16. | NH_3 | Ammonia |
| 17. | BCl_3 | Boron trichloride |
| 18. | N_2O | dinitrogen monoxide |
| 19. | BrF_5 | bromine pentafluoride |
| 20. | CO_2 | Carbon dioxide |
| 21. | CO | Carbon monoxide |
| 22. | ClF_3 | chlorine trifluoride |
| 23. | ICl | Iodine monochloride |
| 24. | CH_4 | carbon tetrahydride methane |