**Science 10: Ionic formulas with Polyatomic Ions**

Name:

Date:

A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ion is an ion composed of more than one type of atom joined by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bonds. Because polyatomic ions carry an electric charge, they cannot exist on their own. An example of a polyatomic ion is carbonate, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.



**Polyatomic Ions:** You DO NOT have to memorize these!

|  |  |  |  |
| --- | --- | --- | --- |
| **Positive Ions** | **Negative ions** | | |
| NH4+ ammonium | CO32- carbonate  NO3- nitrate | ClO3- chlorate  PO43- phosphate | OH- hydroxide  SO42- sulphate |

**Writing the Formula of a Compound with Ployatomic Ions:**



|  |  |  |
| --- | --- | --- |
| **Steps** | **Examples** | |
| **Manganese(III) chlorate** | **Ammonium sulphate** |
| 1. Identify each ion and its charge |  |  |
| 1. Determine the total charges needed to balance positive with negative |  |  |
| 1. Note the ratio of positive ions to negative ions |  |  |
| 1. Use brackets around ions to correctly show the ratio of ions |  |  |
| 1. Use subscripts and brackets to write a formula. Omit brackets if only one ion is needed. |  |  |

**Your turn ☺:**

*Write the names of the following compounds with polyatomic ions*



1) (NH4)3P 2) Al(OH)3



*Write the formulas of the following compounds with polyatomic ions*

1) ammonium nitrate 2) bismuth(V) phosphate



**Science 10: Names and Formulas of Covalent Compounds**

Name:

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In a covalent compound, the precise number of atoms of each element in the molecule is shown by the chemical formula.

For example, H2O2 is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ compound called hydrogen peroxide (common name). Each molecule has \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ hydrogen and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ oxygen atoms for a total of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ atoms. If this was an ionic compound the formula would be reduced to HO. This is because the subscripts in a covalent compound have different meaning than those in an ionic compound. In a covalent compound the subscripts show the actual number of atoms of each element in the molecule.

**Naming Binary Covalent Compounds:**

A binary covalent compound contains \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ elements joind together by one or more \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bonds.

**Rules:**

#1: do not use a prefix when there is only one atom for the first element

#2: do not reduce the number of atoms indicated by the subscripts

**Prefixes:**

Mono- 1 hexa – 6

di- 2 hepta - 7

tri- 3 octa - 8

tetra – 4 nona - 9

penta – 5 deca - 10

|  |  |  |
| --- | --- | --- |
| **Steps** | **Examples** | |
| **CO** | **N2O3** |
| 1.Name the left most element in the formula first |  |  |
| 2.Name the second element, making sure the element name ends with the suffix ‘ide’ |  |  |
| 3.Add a prefix to each of the element’s name to indicate the number of atoms of each element in the compound |  |  |

**Your turn ☺:**

*Write the names of the following compounds*

1) N2O 2) S2F10

*Write the formulas of the following compounds*

1) nitrogen tribromide 2) diiodine hexachloride