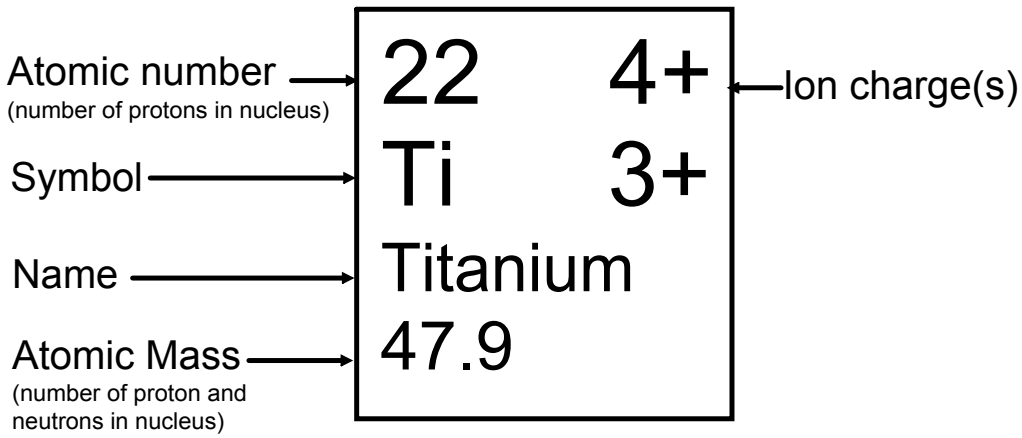
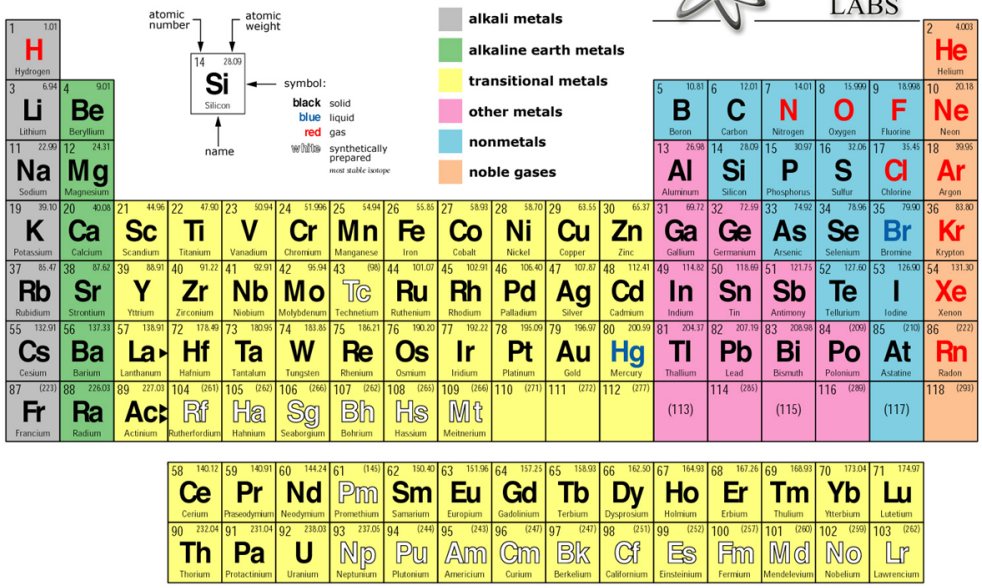
Chemistry

The Periodic Table



Periodic Table of the Elements



Ionic Compounds - a compound composed of oppositely charged ions (typically a +ve metal and -ve non-metal) in which electrons are transferred from a metal to a non-metal

Anion - a negatively charged ion

Cation - a positively charged ion

Molecular Compound - a compound composed of two non-metals which share electrons

Naming Binary Ionic Compounds

1) the first part of the name is always the +ve metal cation(sodium, nickel, iron, etc...)

2) the second part of the name is always the -ve non-metal anion and uses the suffix *-ide* at the end of the non-metal (chloride, iodide, oxide, etc...)

Example:
NaCl - Sodium and Chlorine = Sodium Chloride
CaBr - Calcium and bromine = Calcium Bromide
Al_2O_3 - Aluminum and Oxygen = Aluminum Oxide

Naming Ionic Compounds with a Multivalent Metal

1) the first part of the name is always the +ve metal cation with its ion charge written in brackets as a roman numeral (sodium, nickel, iron, etc...)

2) the second part of the name is always the -ve non-metal anion and uses the suffix *-ide* at the end of the non-metal (chloride, iodide, oxide, etc...)

Example:
Cu_3N - Copper and Nitrogen = Copper (I) Nitride
Fe_2O_3 - Iron and Oxygen = Iron (III) Oxide

Naming Compounds with a Polyatomic Ion

1) the first part of the name is always the +ve ion (sodium, nickel, iron, etc..

2) the second part of the name is always the -ve polyatomic ion (nitrate, carbonate, phosphate, etc...)

Example:
K_3PO_4 - Potassium and Phosphate - Potassium Phosphate

Naming Molecular Compounds

1) name the element furthest to the left first on the Table of Elements
2) change the ending of the second non-metal to –ide
3) use a prefix to specify the number of each element present

Example:
CO_2 - Carbon Dioxide *don't use mono prefix on the first element
SF6 - Sulfur Hexafluoride
H2O2 - Dihydrogen Dioxide or hydrogen peroxide

mono	1
di	2
tri	3
tetra	4
penta	5
hexa	6
hepta	7
octa	8

Quick Review

Know how to name:
-Binary Ionic Compounds
-Ionic Compounds with Multivalent Metals
-Ionic Compounds with Polyatomic Ions
-Molecular Compounds

Example: Name the following compounds
a) CaF_2
b) $PbBr_2$
c) $KMnO_4$
d) CO_2

Writing Chemical Formulas for Binary Ionic Compounds

Write the formulas for Calcium Iodide and Magnesium Sulfide

Step 1. Write the symbols with the metal cation first.

Ca I Mg S

Step 2. Write the ionic charge above each symbol indicating its ion.

$^{2+}$Ca $^{1-}$I $^{2+}$Mg $^{2-}$S

Step 3. Use cross-over method to balance the charges in the compound

CaI_2 Mg_2S_2

Step 4. Reduce if necessary MgS

Step 5. Check your solution by drawing Lewis Dot diagram arrangement for the compound

Writing Formulas for compounds with Polyatomic Ions

Write the formulas for Calcium Nitrate and Magnesium Sulfate

Step 1. Write the symbols with the metal cation first.

Ca NO_3 Mg SO_4

Step 2. Write the ionic charge above each symbol indicating its ion.

^{2+}Ca $^{1-}NO_3$ ^{2+}Mg $^{2-}SO_4$

Step 3. Use cross-over method to balance the charges in the compound

$Ca(NO_3)_2$ $Mg_2(SO_4)_2$

Step 4. Reduce if necessary $MgSO_4$