**NOTES: Compounds and Bonding**

**Recall from Ch. 1 and 2**

* **Elements are made up of only one type of atom**

**such as Hydrogen = H2 or Copper = Cu**

* **Molecules are made up of two or more atoms**

**such as Cl2 or CO2**

* **The molecules of a compound are made up of 2 or more atoms from different elements.**

**such as K2S**

**What is a compound?**

* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ joined together by chemical bonds**
* **The substance has \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ properties than the elements that make it up.**
* **The elements making up the compound exist in specific ratios**

**Ex. Water = H2O Contains:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Chemical formulas of Compounds /Molecules show:**

1. **The proportion of each element present in the substance**
2. **The elements present in a substance**
3. **Number of atoms of each element in the substance**
4. **Parentheses may be used to show groups of atoms that stay together and behave as a unit**

**E.g. CO 2 =**

**E.g. Ca(NO3)2 =**

**How many atoms are in the following compound: Ca3N2 ?**

**Try the Following:**

**1) How many different elements are in the following compound? Al (OH)3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**How many atoms are in this compound? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**2) How many elements different are in the following compound? (NH4)3 PO4 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**How many atoms are in this compound? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

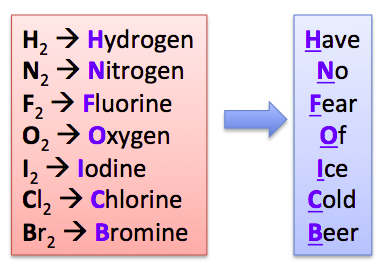
**2 Types of Compounds**

|  |  |
| --- | --- |
|  | |
| * Electrons\_\_\_\_\_\_\_\_\_\_between non-metals * Eg. H2O (water) * Form “molecules” a neutral particle made up of atoms joined by covalent bonds * Bonding due to electron sharing | * Electrons \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_from metal to   non-metal to create oppositely charged ions   * Eg. NaCl (table salt) * Form “ionic lattice” * Bonding due to attraction between oppositely charged ions (+/-attraction) |

**Covalent Compounds (Molecules)**

­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ atoms \_\_\_\_\_­\_\_\_\_\_\_\_\_\_\_\_\_ electrons to form \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

|  |  |
| --- | --- |
| **Example 1** H­2O | **Example 2** CH4 |
|  |  |

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**Diatomic moleules: Non-metal elements that always exist as two atoms  
   
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_covalently bonded together.**

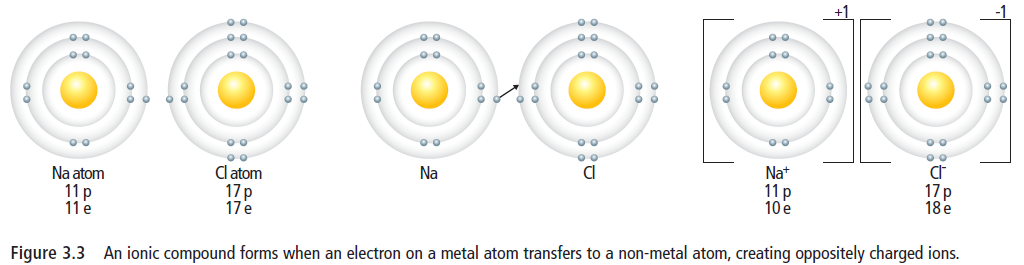
**Ionic Compounds**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_atoms *transfer* electrons to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

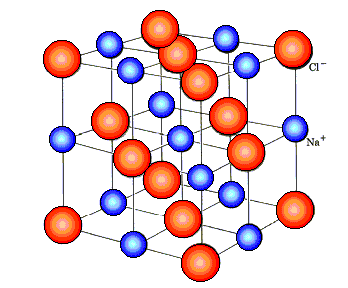
Create oppositely charged \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Positive and negative charges balance each other forming a neutral \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Example** NaCl



\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ charged Sodium ions are attracted to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ charged Chloride ions



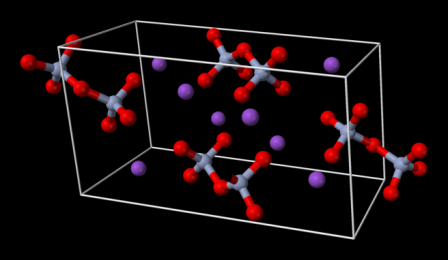
Ions come together to form an \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

All \_\_\_\_\_\_\_\_\_\_ ions attract all \_\_\_\_\_\_\_\_\_\_ ions to form a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (eg. grains of salt).

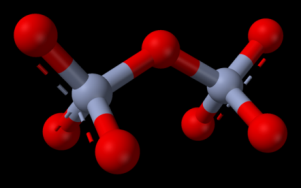
**Polyatomic Ions -** An ion that is made up of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ atoms that are held together with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_bonds.

Both \_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_ bonds can sometimes be found in the same \_\_\_\_\_\_\_\_\_\_\_\_\_.

In potassium dichromate (K2Cr2O7), potassium (K+) is ionically bonded to dichromate (Cr2O72-),



The dichromate ion (Cr2O72-) contains 7 oxygen atoms which are **covalently** bonded to 2 chromium atoms. This 9 atom unit has a charge, so it is called a polyatomic ion.



**HOMEWORK:** Refer to text pages 76-80 and then complete Textbook Pg 83 #2-9. Complete *Ions vs Atoms vs Compounds*