

CHEMICAL BONDING

An Internet Searching Adventure by Mr. Burghardt

Instructions: Use your web-searching skills to answer the following questions and to complete the "Bonding Comparison Chart". You may need to visit a wide array of sites in order to **locate** and **validate** your answers!

Introduction to Bonding

Make sure your answers are in your own words!

1. What is a chemical bond?

A chemical bond is an attraction between atoms in order to create compounds made of two or more atoms.

2. Why do most atoms form chemical bonds?

Atoms form bonds in order for each atom to have a complete outer shell, and to become stable and 'happy ☺'

Bonding Comparison Chart

	Ionic	Covalent	Metallic (Metals)
<u>Types of Atoms Involved</u> Metals? Nonmetals? Metalloids? Some of each?	Metals and Nonmetals	Nonmetals	Metals and Metals
<u>Method of Bond Formation</u> How do the atoms bond together? What is actually happening in order for the bonds to occur? Are electrons transferred? shared? Traded? This section is <u>VERY</u> important!	A Transfer of electrons from the metal to the nonmetal. Positive ions and negative ions are attracted to one another and the bond occurs.	Sharing of valence electrons between nonmetal atoms. This ensures that each atom has a complete valence (outer) shell.	Valence electrons are shared among all of the atoms. It is a 'sea of electrons' among a positively charged group of nuclei.
<u>Type of structure</u> Once the compound is created, what does it look like? Does it have a crystal structure? Lattice structure? Are the electrons shared among all of the atoms' nuclei? Does it form a molecule?	Crystalline (Regular) or Crystal Lattice (Regular + Repeating)	Molecular (Forms a Molecule)	Crystalline (Regular) with electrons moving throughout all atoms

<p>Physical state</p> <p>What state of matter are <u>most</u> compounds of each type? solid, Liquid, Gas, Plasma? some of each?</p>	<p>Solids</p>	<p>Liquids and Gases (and very low melting point solids)</p>	<p>Solids</p>
<p>Melting Point</p> <p>What kinds of melting points do <u>most</u> compounds of each type have? High? Low? Provide Examples of melting point for each type of compound</p>	<p>High Melting Points</p> <hr/> <p>Compound 1: NaCl Melting Point: 800° C</p> <p>Compound 2: MgO Melting Point: 2852° C</p>	<p>Low Melting Points</p> <hr/> <p>Compound 1: CCl₄ Melting Point: -23° C</p> <p>Compound 2: H₂O Melting Point: 32° C</p>	<p>High Melting Points</p> <hr/> <p>Metal 1: Aluminum Melting Point: 660° C</p> <p>Metal 2: Copper Melting Point: 1084° C</p>
<p>solubility in water</p> <p>Are the compounds soluble in water? Circle one!</p>	<p>Yes! No Way!</p>	<p>Yes! No Way!</p>	<p>Yes! No Way!</p>
<p>Electrical Conductivity</p> <p>Do the compounds conduct electricity? Circle one and explain!</p>	<p>Yes! No! Kinda!</p> <p>Explain: Ionic Compounds conduct electricity when melted or when they are dissolved in water.</p>	<p>Yes! No! Kinda!</p> <p>Explain: Covalent compounds do not conduct electricity no matter what state of matter</p>	<p>Yes! No! Kinda!</p> <p>Explain: Metals conduct electricity as solids and when they are melted.</p>
<p>other Properties</p> <p>What are 2 other properties for each type of compound??</p>	<p>Property 1: Most ionic compounds are hard.</p> <p>Property 2: Most ionic compounds are brittle.</p>	<p>Property 1: Some are flammable.</p> <p>Property 2: Poor conductors of heat.</p>	<p>Property 1: Most metals are malleable (can be hammered)</p> <p>Property 2: Most metals are shiny and hard.</p>
<p>Image</p> <p>Draw an image of each type of BOND! Be sure to show what is happening with the electrons during the bond!</p>			