Study Guide for Chemical Bonding Quiz
Book: “Chemical Interactions” CH. 1-3, 1-4, 1-5
“Ionic, Covalent, & Metallic Bonding”
on Tuesday 11/11/14

• About the Test:
  ➢ 27 questions, worth 54 points
  ➢ Quiz will be in QUIA
  ➢ You WILL be provided with a Periodic Table for reference

• HOW to Study:
  ➢ Review ALL notes, handouts, labs, reading guides/outlines, vocabulary words (make flash cards if needed)
  ➢ Have someone quiz you, using the list of concepts below
  ➢ RE-READ the online textbook sections 1-3, 1-4, and 1-5

• Terms to Know:
  ➢ Section 1.3 Ionic Bonds: ion, polyatomic ion, ionic bond, ionic compound, chemical formula, subscript, crystal
  ➢ Section 1.4 Covalent Bonds: covalent bond, molecule, double bond, triple bond, molecular compound, polar bond, nonpolar bond
  ➢ Section 1.5 Bonding in Metals: metallic bond, alloy, ductile, malleable, “sea” of electrons

• Section 1.3: Ionic Bonds - Objectives
  1. Describe ions, and explain how they form bonds:
     • Find the number of valence electrons in an element from its position in the periodic table
     • Tell the ionization number (resulting charge) that will occur when an element gains or loses an electron (see p. 23 as well as class notes)
     • Explain why metals tend to form positive ions, while nonmetals form negative ions (based on position in periodic table and your knowledge of valence electrons)
     • Based on the above, be able to explain why ionic compounds are formed from a metal bonding with a nonmetal.
     • Explain why ionic compounds have an overall neutral charge (0) even though the ions that make them up have individual positive or negative charges
     • Use (or interpret) a Lewis dot diagram to represent ions
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- Given a chemical formula for an ionic compound (example: MgCl₂), explain what the “2” in the formula indicates

2. Identify the properties of ionic compounds
   - Define “crystal” and explain the underlying structure of atoms that form in crystals
   - Explain WHY ionic compounds have high melting points and are good conductors of electricity
   - Tell how properties of ionic compounds change in solution as compared to their solid state (example: salt water vs. pile of salt crystals)

- Section 1.4: Covalent Bonds – Objectives
  1. State what holds covalently bonded atoms together
  2. Identify the properties of molecular (covalent) compounds
  3. Explain how unequal sharing of electrons occurs and how it affects molecules
     - Tell the difference between polar and nonpolar covalent bonds
     - Describe how these types of bonds affect the ability of certain compounds to mix (or not)
     - Explain how detergent works

- Section 1.5 Bonding in Metals – Objectives
  1. Describe how metal atoms are bonded in solid metal
  2. Explain how metallic bonding results in useful properties of metals
     (know the various properties of metals and their definitions (ductile, malleable, etc.)
  3. Tell what is meant by a “sea of electrons” in metal crystals

- How to Study:
  - Review your notes
  - Review handouts we have used in class to study chemical bonding
  - Make flash cards for vocabulary terms if you need to know them better
  - Ask someone to quiz you on the topics in this study guide.
  - Go online to www.pearsonsuccessnet.com and re-read chapter 1, sections 1,2, and 3 in the book “Chemical Interactions”
  - Review the Guided Reading handouts you completed for those sections.