

Chapter 8 – Basic Concepts of Chemical Bonding (Syllabus)

Chemistry: The Central Science

1. Read pgs. 297-337 at least 2-3 times!! Read and take notes on sections 8.1-8.2 for tomorrow.
2. 8.1 – 8.2 (Lewis Symbols and the Octet Rule and Ionic Bonding):
 - Lewis symbols: we called them electron dot diagrams last year.
 - 3 major types of chemical bonds: covalent, ionic, and metallic
 - Don't forget about the Octet Rule.
 - Lattice energy:
 - ✓ Represents the stability of ionic compounds (charges & sizes of ions)
 - ✓ Take "A Closer Look" on pg. 305 to see how the Born-Haber cycle can help to calculate lattice energy ($\Delta H_{\text{lattice}}$)
 - Transition metals: covered in Ch. 7; lose *s* electrons first & then *d* electrons as needed; they don't always acquire a noble gas configuration as ions.
 - Polyatomic ions: as a "group" possess a single charge
3. 8.3 – 8.4 (Covalent Bonding and Bond Polarity and Electronegativity):
 - Lewis Structures (a.k.a.: Lewis electron dot structures)
 - single-double-triple bonds: strength & distance
 - nonpolar-polar-ionic: What does the symbol " δ " next to a charge mean?
 - We'll use electronegativities again.
 - Dipole moment, μ : for bonds and for a molecule as a whole. The units are a bit strange. Can you break these problems into more (easy-to-follow) steps to keep track of the units?
4. 8.5-8.7 (Drawing Lewis Structures, Resonance Structures, and Exceptions to the Octet Rule):
 - Drawing Lewis Structures (5-6 Steps): we'll get some practice with this in the lab.
 - Formal charge: What is its purpose?
 - Resonance structures: The "most probable" structures
 - 3 Types of exceptions to the Octet Rule: BF_3 & SF_6 are a couple sweet babies!!
5. 8.8 (Strengths and Lengths of Covalent Bonds):
 - Strengths & Lengths of Covalent Bonds: Tables 8.3 and 8.4
 - ΔH_{rxn} can be estimated from bond energies
6. Labs:
 - ❖ "Molecular Polarity" PhET Lab
 - ❖ "Experiment 11: Molecular Geometries of Covalent Molecules"
7. Chapter 8 Exercises:
 - Visualizing Concepts & Exercises: #'s 1, 2, 9, 11, 13, 15, 19, 24, 26, 29, 33, 35, 39, 41, 44, 47, 51, 53, 55, 63, 69, & 73
 - Additional Exercises: #'s 79, 83, 88, 90, 92, & 93
 - Integrative Exercises: #'s 97, 100, 104, 107 & 108
8. Test: A combined Ch. 8 & 9 will be in 2-3 weeks.