**Chemistry – Semester 2 Exam Study Guide – 2016**

**At the end of each chapter there are starred questions that have the answers printed in appendix E. Take advantage of these!**

**Chapter 8:**

1. Practice drawing Lewis structures for atoms and molecules and polyatomic ions.
2. You are responsible only for the molecular shapes we’ve used in class.
3. What is the difference between molecular and structural formulae?
4. What is the unit for a covalently bonded compound? An ionic compound?
5. List the diatomic molecules.
6. What is the octet rule? How does it apply to this chapter?
7. What is shared in single, double, and triple covalent bonds?
8. How do you figure out if you have a multiple bond? What is the calculation for # of bond lines?
9. What is a coordinate covalent bond?
10. What is bond dissociation energy and how does it relate to bond strength?
11. What is potential energy and how does it relate to atoms and bonding?
12. What is a resonance structure?
13. What is VSEPR theory? Explain it…not just what words the letters represent!
14. Why are there polar and non-polar bonds?
15. What is electronegativity? How does it relate to bond type?

**Chapter 9:**

1. Be able to determine the charge of an ion and write ion names.
2. Explain the difference between monatomic and polyatomic ions.
3. Name and write formulas for binary ionic compounds.
4. Name and write formulas for compounds with polyatomic ions.
5. Determine whether a compound is ionic or molecular.
6. Name and write formulas for binary molecular compounds. (know prefixes)
7. ![C:\Documents and Settings\mahenry\Local Settings\Temporary Internet Files\Content.IE5\25IQWMHG\MC900233834[1].wmf]()Know what the suffixes –ite and –ate mean.

**Chapter 10:**

1. What is a mole?

2. Avogadro’s number

3. Convert moles to particles, particles to moles.

4. Convert moles to grams, grams to moles.

5. Convert particles to grams, grams to particles. (2 steps)

6. Be able to calculate average atomic mass and molar mass.

7. Be able to determine empirical formulas when given % composition.

8. Calculate % composition.

9. Know when to use different labels: atom, ion, molecule, formula unit.

10. What do subscripts in a chemical formula tell you?

11. Why aren’t atomic mass whole numbers?

12. What are isotopes?

13. Be able to give formulas for compounds.

**Chapter 11:**

1. What is the Law of Conservation of Mass, and how does it relate to balancing equations?

2. What is the difference between a coefficient and a subscript?

3. Know all symbols for states of matter, heat, catalyst, etc. that are found in chemical equations.

4. What is a catalyst?

5. What are the reactants/products for a combustion reaction?

6. What is a synthesis reaction? Give an example.

7. What is a decomposition reaction? Give an example.

8. What is a double displacement reaction? Give an example.

9. What is a single displacement reaction? Give an example.

![C:\Documents and Settings\mahenry\Local Settings\Temporary Internet Files\Content.IE5\25IQWMHG\MC900291934[1].wmf]()10. What is the activity series? How is it used to predict the outcome in single displacement reactions?

11. Practice naming compounds.

12. Know diatomic molecules. **HONClBrIF**

**Chapter 12:**

1. What is stoichiometry?

2. What is a mole ratio? Be able to use a balanced equation to find a mole ratio.

3. Solve stoichiometry problems involving moles by using mole ratios.

4. Solve stoichiometry problems involving mass by using molar mass.

5. Solve stoichiometry problems involving volume by using density.

6. Solve stoichiometry problems involving number of particles by using Avogadro’s number.

7. What is the molar volume of a gas at STP?

8. What is a limiting reactant? Excess reactant?

9. Be able identify the limiting reactant in a reaction and use it to calculate theoretical yield.

10. What is the difference between actual yield and theoretical yield?

11. What is the formula for calculating percentage yield?

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**Chapter 17 (plus 13)**

1. What is energy?

2. Endothermic vs. exothermic

3. Law of conservation of energy

4. Heat vs. Temperature

5. What is specific heat? What does it mean if something has a high or low specific heat?

6. Enthalpy

7. Molar heat capacity

8. Q = mCΔT

9. Thermochemistry

10. Describe characteristics of the different states of matter (movement of particles, shape, volume, etc.)

11. What is viscosity?

12. Explain the energy changes involved in changes of state.

13. molar heat of fusion, vaporization, fusion, and condensation

14. What is vapor pressure? What is normal atmospheric pressure?

15. Know how to interpret phase diagrams.

**Chapter 14:**

1. Describe the general properties of gases.

2. Know the SI unit for pressure and force. Be able to convert between units of pressure.

3. Know what STP means and the values associated.

4. What is the kinetic molecular theory?

5. State Boyle’s Law. Use it to solve problems involving pressure and volume.

6. State Charles’s Law. Use it to solve problems involving temperature and volume.

7. State Gay Lussac’s Law. Use it to solve problems involving pressure and temperature.

8. State the Combined Gas Law. Use it to solve problems involving pressure, temp and volume.

9. What is the ideal gas law? Be able to solve problems using it.

10. Explain diffusion and effusion.

11. What is partial pressure? Explain Dalton’s Law of Partial Pressure.

**Chapter 16:**

1. Define molarity and know how to calculate.

Problem Solving:

1. # of atoms in molecules
2. Moles -- > atoms
3. Molar mass
4. Mol 🡪 grams
5. Gas from L 🡪 mol at STP
6. % composition from grams
7. Empirical formula from % composition
8. Mol 🡪 stoichiometry (A🡪B)
9. Gram 🡪 gram stoichiometry (A🡪B)
10. Gram 🡪 mol stoichiometry(A🡪B)
11. Reaction stoichiometry figuring out which reactant is limiting
12. % yield
13. Pressure conversions
14. Boyle’s law calc
15. Charles’ law calc
16. Dalton’s law calc
17. Gay-Lussac’s law calc
18. Combined gas law
19. Graham’s law
20. Ideal law calc