

To be successful on exam 3, if do the following (in addition to the objectives for exam 1 & II):

**ATOMS AND MOLECULES PART 2****CHAPTER SECTION**

1. ID trends in electron affinity & electronegativity

**Chapter 7, Section 5****Chapter 6, Sections 4, 6-7**

2. Calculate wavelength, mass or velocity, given 2 of the 3.

3. Explain orbital, electron density, & probability

4. Give the shape and number of each type of orbitals

5. Predict similarity of properties by location in the periodic chart.

**Chapter 7, Sections 1-4, 6**

6. Write the ground state electron configurations for atoms & ions

7. Write orbital diagrams for atoms & ions; ID paramagnetic and diamagnetic

**Chapter 6, Section 5**

8. Explain the meaning of each Quantum Number

9. Write the Quantum numbers for an electron

**BONDING AND GEOMETRY-****CHAPTER SECTION****Chapter 8, sections 1-7**

1. Predict what ions are formed from given elements, using electron structure.

2. Determine bond type: ionic, covalent, polar covalent.

3. Determine bond polarity

4. Write electron dot symbols for atoms, ions, and compounds

5. Write resonance structures for molecules

6. Describe the octet rule and its limitations

7. Assign formal charges

8. Summarize VSEPR theory

9. Determine the shape of molecules and ions (geometry)

10. Determine the bond angles in a compound or ion

11. Determine the polarity of a molecule

**Chapter 8, section 8**

12. Determine bond order and bond length

**Chapter 8, section 9**

13. Predict solubilities based on polarity

**Chapter 9, sections 1-3**

14. Summarize Valance Bond Theory

15. Determine the hybridization about an atom in a compound or ion

16. Determine the number of sigma and pi bond in a compound or ion

17. Describe the MO theory

**THERMOCHEMISTRY****CHAPTER SECTION****Chapter 5, Sections 1-8**

1. I.D. endothermic & exothermic rxns

**Chapter 8, Section 9**

2. Define calorie, Calorie, joule. Convert between these units

3. Use 3 of these to calculate the 4th (Q, m, s,  $\Delta T$ )

4. Describe the differences between heat and temperature

5. Predict and calculate changes in internal energy, work, heat
6. Predict  $\Delta H_{\text{rxn}}$  in processes (+, - or  $\approx 0$ )
7. Recognize standard state, standard conditions and state functions
8. Calculate  $\Delta H_{\text{rxn}}$  using:
  - heating curve,
  - calorimetry,
  - $\Delta H_f^\circ$ ,
  - by combining known  $\Delta H_{\text{rxn}}$  values,
  - by using bond energies, or
  - by proportionality