**CHM 115: Exam 1 Review Sheet**

**Chapter 1**

• Scientific method

* Physical states of matter
* Determine physical state of substances

(Solids, liquids, gases)

* + Know terms for changes of state
  + Melting, freezing, evaporation, condensation, sublimation, deposition
  + Know trend for increasing temperature
  + Know the physical state of all elements at room temperature (25°C)
* Names and symbols of the elements
  + Correct spelling of element names counts!
* Classification of matter
* Given examples, determine which are elements, compounds, or mixtures

**Chapter 2**

• Length, mass, weight, volume

• Significant figures or digits

* Rounding
* In addition, subtraction
* In multiplication, division
* In measurements (uncertainty)

• Scientific notation

• Problem solving by unit analysis method

* Solve problems using unit factors, showing all necessary steps involved

• Percentage: ratio of parts per 100 parts

* + Given amount of part and whole, calculate %
  + Given %, calculate amount of part or whole

• Metric system

* + Know prefixes: micro, nano, milli, centi, deci, kilo
  + Be able to perform metric-metric conversions using these prefixes
  + 1 cm3 ≡ 1 mL (exact)

• Use metric-English conversions given

(e.g. 1 in. ≡2.54 cm; 1 lb.=454 g; 1 qt.=946 mL)

• Volume by calculation

* + Rectangular solid: L x W x T

• Volume by displacement

* Temperature
  + Be able to perform conversions for °F-to-°C or °C-to-K

• Density: d = m /V

* + Be able to determine density, mass, or volume given the other two quantities
  + Identify what items sink or float given densities of items and of liquid

**Chapter 3**

* Periodic Table
  + Group and period names
* Metals, nonmetals, and semimetals
  + Location on Periodic Table and properties
* Compounds
  + Molecules
  + Ionic Compounds
    - cations/anions
* Law of Definite Proportions
* Law of Multiple Proprotions

**Chapter 4**

* Physical and chemical properties and changes
* **Forms of Energy:** heat, light, electrical, mechanical, chemical, and nuclear
* Law of Conservation of Mass
* Law of Conservation of Energy
* Law of Conservation of Mass and Energy
* Heat
  + Specific heat
  + q=mc∆T

**Chapter 5**

* John Dalton’s Model
* Thomson’s Model
* Rutherford’s Alpha Scattering Experiment
* Nuclear Model
* Subatomic particles
* proton (p+): +1 charge, located inside nucleus
* neutron (n): neutral, located inside nucleus
* electron (e–): –1 charge, located outside nucleus
* Atomic notation:
  + - atomic number = Z
    - mass number = A**E =** element symbol
    - mass number (A): # of protons + # of neutrons
    - atomic number (Z): # of protons=# of electrons
* Be able to give atomic notation for any element given element name & mass number
* Mass number, atomic number, element symbol
  + Given 2, determine the missing info
* Recognize the terms: isotope, atomic weight
* Given all naturally occurring isotopes for an element, use the Periodic Table to determine the most abundant isotope
* Chemical formulas