

## CHM1045 Study Guide for Test 3 (Ch. 5, 6, 7, & part of Ch. 11 in Tro textbook)

*Revised April 3, 2014*

This is NOT a complete list of what will be on the Test. You must also study class notes, the homework, and the textbook. This is just a study guide to help you. You still have to know everything on Exam 1 & 2. ☹

### Chapter 5 - Gases

Know definitions in words, equations of, and do calculations with: Gases, pressure, mmHg, in.Hg, Pa, psi, atm, STP, molar volume, Boyle's Law, Charles' Law, Avogadro's Law, Graham's Law, Dalton's Law of Partial Pressures, Ideal Gas Law, density of a gas, molar mass of gas, partial pressures, mole fractions, collecting gases over water, stoichiometry (using mole ratios), kinetic molecular theory, molecular velocity, average kinetic energy, diffusion, effusion, Graham's Law, ideal gases, real gases, van der Waals equation.

### Chapter 6 – Thermochemistry

Know definitions in words, equations of, and do calculations with: thermochemistry, thermodynamics, kinetic energy, potential energy, law of conservation of energy, units of energy, Joule, calorie, Calorie, first law of thermodynamics, internal energy (E), work (w), heat (q), system, surroundings, specific heat, molar heat capacity, heat capacity,

$$\text{heat} = (\text{specific heat})(\text{mass})\Delta T \quad ,$$

enthalpy, constant volume calorimeter, constant pressure calorimeter,  $\Delta H$ , calculate  $\Delta H$  for reactions in kJ/mole of any reactant or product, exothermic, endothermic, Hess' Law, state function, enthalpy of formation, standard conditions, calculate  $\Delta H$  of a reaction using enthalpies of formation, energy consumption, global climate change, atmospheric carbon dioxide.

### Chapter 11

Know definitions in words, equations of, and do calculations with: vaporization, melting, freezing, condensation, sublimation, deposition, evaporation, boiling, heat of vaporization, heat of fusion, heating curve, cooling curve, vapor pressure.

### Chapter 7

- 1) Know definitions in words, equations of, and do calculations with: Define, identify and/or give examples of: light, electromagnetic radiation (emr), wavelength, frequency, gamma ray, x-ray, ultraviolet (UV), infrared (IR), microwave, radio waves, photoelectric

effect, photon, emission spectra, line spectra, deBroglie wavelength, Heisenberg's Uncertainty Principle, probability density, Schrodinger's wave equations, principal quantum number ( $n$ ), angular momentum ( $l$ ), magnetic quantum number ( $m_l$ ), spin quantum number ( $m_s$ ), allowed values of quantum numbers, Bohr model of atom, shapes of atomic orbitals,  $l=0$  is s orbital,  $l=1$  is p orbital,  $l=2$  is d orbital,  $l=3$  is f orbital.

- 2) Know  $\lambda\nu = c$ ,  $E = h\nu$ ,  $\lambda =$  wavelength,  $\nu =$  frequency, calculate energy, wavelength or frequency of light emitted from an atom, calculate  $\Delta E$  of electron in an atom.