

## Chem 101A Exam 2 Concepts

### Chapter 2

- ✓ Nomenclature of acids

### Chapter 3 – Stoichiometry

- ✓ Average atomic mass - isotopes and abundances calculations
- ✓ atomic mass, molar mass, formula weight, molecular weight (all the same thing more or less)
- ✓ moles  $\leftrightarrow$  {molecules, atoms, formulas}  $\leftrightarrow$  grams
- ✓ formula  $\rightarrow$  percent composition
- ✓ mass data OR percent composition  $\rightarrow$  empirical formula
- ✓ empirical formula & molar mass  $\rightarrow$  molecular formula
- ✓ balancing chemical equations
- ✓ grams  $\rightarrow$  moles  $\rightarrow$  moles  $\rightarrow$  grams (see stoichiometry chart)
- ✓ limiting reactant, excess reactant, theoretical yield, actual yield, percent yield

### Chapter 4 – Solutions & Redox Stoichiometry

- ✓ Strong electrolytes, weak electrolytes, non-electrolytes
- ✓ Strong acids (HCl, HBr, HI, HNO<sub>3</sub>, H<sub>2</sub>SO<sub>4</sub>, HClO<sub>4</sub>) vs weak acids (all other acids)
- ✓ Molarity
  - calculate given grams or moles and volume
  - (molarity)(liters) = moles
  - Dilution/Concentration:  $M_1V_1 = M_2V_2$
  - molarity ions = molarity formula x # ions per formula
  - as a pathway to and from moles in stoichiometry (see stoichiometry chart)
- ✓ Qualitative Solubility Rules (handout) – Predict solubility: Soluble, Slightly Soluble, Insoluble (handout) and use to predict precipitation reactions (see below)
- ✓ Precipitation reactions
  - Write and balance: molecular, complete ionic, net ionic
  - Predict precipitate (see solubility rules handout)
  - stoichiometry of (see stoichiometry chart), limiting reactant concepts in Chapter 3
- ✓ Acid-Base reactions
  - Predict products and balance
  - stoichiometry of (see stoichiometry chart), limiting reactant concepts in Chapter 3
- ✓ Oxidation-Reduction Reactions
  - Assign oxidation state of any atom (handout)
  - Predict which species are oxidized or reduced
    - Oxidation, Losing Electrons, Reducing Agent
    - Reduction, Gaining Electrons, Oxidizing Agent
  - Determine number of electrons transferred in balanced redox equation
  - ~~Balance Redox Reactions~~