CHEM 102 Dr. Williamson EXAM III Fall 21

You should be successful on Exam III, if you can do the following in addition to the skills from CHEM 101, Exam I, and Exam II:

EQUILIBRIUM -Unit 16, Sections 1-4

9. Use K and initial concentrations to find the equilibrium concentrations
10. Explain and Calculate how changes in conc, temp, volume, & pressure effect equilibrium
11. Calculate K from ΔG **Unit 20.3c -e**

ACIDS & BASES –Unit 17, Sections 1-6

1. ID general properties of acidic and basic solution and calculate electrolyte ion conc.
2. Describe Arrhenius, Bronsted, and Lewis theories
3. ID and describe weak, strong, and nonelectrolytes
4. ID Bronsted acids, bases, and conjugate acid-base pairs and their strengths
5. Predict the strength of binary and ternary acids
6. Explain what is meant by autoionization of water AND write the ion-product constant
7. ID strong acids and bases and calculate their pH, pOH, $[H^+]$, or $[OH^-]$
8. Describe Ka and Kb; Predict the strength of an acid or base from Ka or Kb.
9. Use 2 of these to find the 3rd for weak acids and bases: Ka or Kb, pH or pOH, conc., Kw
10. Calculate % ionization using equil concentration, pH or pOH, & Ka or Kb v.v.
11. Relationship between acid strength and K
12. Relationship between conjugate acid-base pair strength, Ka/Kb, and K
13. Write the products of acid/base rxns, including net ionic equations
14. Predict & calculate the pH of a salt
15. Predict & calculate the pH of a polyprotic acid.

Buffers & Titrations –Unit 18 Sections 1-4

1. Predict and Calculate the effect of a common ion added to a weak acid or base
2. Describe a buffer solution
3. Calculate the pH or conc. of species in a buffer solution given K (v.v.)
4. Describe and calculate the pH or conc. of species in a buffer solution after the addition of strong a or b
5. Describe the titration curve for SA by SB, WA by SB, and WB by SA
6. Calculate the pH or $[H^+]$ / $[OH^-]$ at any point in an acid-base titration
7. Choose an appropriate indicator for a titration

Slightly Soluble Salts –Unit 19, sections 1-4

1. Give the expression for the solubility-product constant for a slightly soluble salt
2. Calculate Ksp from solubility data (vv)
3. Calculate molar solubility
4. Calculate precipitation or the effects of a common ion on solubility