

Review for Exam 2***Chapter 6 Equilibrium***

Section 6.1 – Be able to write equilibrium expressions and calculate equilibrium concentrations,

Section 6.2 – Understand basic thermodynamics as it applies to chemical equilibrium,

Le Chatelier's Principle, Free energy diagrams

Section 6.3 – Understand and be able to perform calculations as they relate to the solubility product
(i.e. common ion effect, separation by precipitation)

Section 6.4 – SKIP (extra credit)

Section 6.6 – Be able to identify a Bronsted-Lowry acid and base in a given acid-base reaction,
know examples of strong acids and strong bases

Sections 6.6 and 6.7 – Be able to determine the pH of any acid or base, be able to calculate K_b from
 K_a and vice versa, know how to use K_w in all of these calculations

Chapter 7 – Volumetric Analysis

Section 7-1 – know basic volumetric analysis terminology (titrant, analyte, equivalence point,
endpoint, titration error, etc), primary standards and standardization

Section 7-2 – be able to perform basic calculations as they relate to titrations (including Kjeldahl
analysis)

Section 7-3 – skip for now

Section 7-4 – Understand how a titration curve is constructed, be able to determine component
concentrations before, at, and after the endpoint.

Section 7-5 – skip

Section 7.6 – skip

Section 7.7 – Understand end-point detection

Chapter 11 – Acid-Base Titrations

Skim over sections 1-3 – understand the difference between 3 types of acid/base titrations:

strong acid – strong base, strong acid – weak base, and strong base – weak acid.

Lab Stuff: Make sure you can do any of the calculations we have done in lab so far!

Practice Problems.

(you may need to use Appendix F or Appendix G in the back of your book to answer some of these questions)

1. Calculate the solubility of $\text{Ba}(\text{IO}_3)_2$ in an aqueous solution.
2. Calculate the molar solubility of $\text{Ba}(\text{IO}_3)_2$ in a solution that is 0.0200 M in $\text{Ba}(\text{NO}_3)_2$ (hint: common ion effect)

3. What is the K_b for the equilibrium
$$\text{CN}^- + \text{H}_2\text{O} \leftrightarrow \text{HCN} + \text{OH}^-$$

4. Calculate the hydronium ion concentration and pH in 0.120 M nitrous acid. The principle equilibrium is:



5. Calculate the pH of each of the following. Use data from appendix G in your text when necessary.

- a. 0.185M HCl
- b. 0.185M $\text{HC}_2\text{H}_3\text{O}_2$
- c. 0.185M HF
- d. 1.12M NH_3
- e. 1.12M sodium acetate
- f. 0.012M calcium hydroxide