

**Some Thoughts on the Reading Assignments****WEEK 2****For Day 1: Acids/Bases II and Complexation**

Chapter 10: We will continue with the material in Chapter 10 section 5.

Chapter 12: We will discuss the material in Ch. 12 on complexation as it affects biological reactions. I suggest becoming familiar with the material on pages 228-237. Unfortunately, there is little written in most textbooks on biological applications of complexation, yet the importance is underscored by the many enzymes that complex metal ions essential for their activity, the interactions between nucleic acids and metals and the fact that compounds like EDTA are added to most buffers used in biochemistry and molecular biology.

Chapter 13: We will cover sections 13.1-2 by using the proton balance equation (handout).

Problems: 12-1, 2, 3, 7; 13-A, 2

**For Day 2: Chemical Separations: Separative Forces**

Chapter 26: We will use a computer program that allows us to virtually separate proteins using chromatographic and electrophoretic techniques. The techniques that are used include those described in pp. 588 – 594 and pp. 599-603. You should understand these techniques before you come to class.

Chapter 23: We will discuss the material in this chapter except we will skip the section on metal extraction. We will also discuss intermolecular forces and their effect on separations as well as the thermodynamics of separations. We will pay particular attention to the topic of diffusion (section 23.4). This is a very important concept in all of biochemistry, not just separations. Skip the sections on asymmetric peaks and scaling up.

Problems: 23-2, 11, 15, 27, 30, 31, 35, 36, 41, 44; 26-B, 5, 7, 16, 21

**For Day 3: Chemical Separations: Diffusive Forces & Optimization**

Chapter 25: We will briefly review the methods in sections 25.1-4 and use them in a computer-based exercise for separating proteins at the end of the week. We will focus on how we use the theory of liquid chromatography to optimize separations by RPHPLC. The sections that will be most useful include: 25.1, 25.3 and 25.4. We will have a hands-on tour of the HPLC to learn the information in Section 25.2.

Problems: 25-3, 9, 11, 12, 15, 17, 18, 34, 35

**Day 4: Fundamentals of Electrochemistry**

Chapter 14: A review of electrochemistry that you should have learned in Chemistry 108. Skim the stuff you already know. The reading in Section 14.7 is new stuff. The relation between  $E^\circ$  and  $E^\circ'$  is most useful for biochemists, so we will spend some time understanding this. Try to follow the example problem in Section 14.7 to fully understand this important difference in standard states.

Problems: 14-A, K, 1, 2, 11, 32, 36, 38 (in-class), 41, 42, 44

**Day 5: Electroseparations & Mass Spectrometry**

Chapter 26: We will cover capillary electrophoresis. Read all of Section 26-5.

Chapter 22: Mass spectrometry is becoming one of the premier analytical techniques in bioanalytical chemistry. Though it would be great to understand all that is in this chapter, we will focus only on Sections

22.1, 22.3 (concepts, not details of instruments), 22.4 (very important for bioanalytical chemists with special emphasis on electrospray of proteins).

Problems: **26**-C, 22, 23, 24, 26, 28, 41, 42, 43; **22**-A, G, 1, 2, 3, 5, 20, 23, 25, 26, 27, 28.