

Some Thoughts on the Reading Assignments

WEEK 3

Day 1: Absorption Spectrophotometry: Fundamentals, Techniques & Instrumentation

Chapter 18: This fundamental chapter is a review of material from Chemistry 107, but at a much higher level. We will have a lot of practice with spectrophotometry during the class. It is one of the most important techniques in the bioanalytical chemist's arsenal. If you have taken P-Chem II some of this chapter may be a review. We will review questions from pages 378-391 today.

Chapter 19: We will only discuss the section on mixtures pp. 402-407.

Chapter 21: We will discuss how an absorption instrument works without going into all the nitty-gritty details of the components that you should have seen in physics classes: pp. 424-425. We will skip the sections on optodes and FT-IR spectrometers. The material on pp. 429-435 may be useful for your spectrophotometer practicum. We will review the very useful bioanalytical technique of surface plasmon resonance spectroscopy (pp. 440-442) as a literature article review.

Problems: **18-C**, 6, 7, 16, 19; **19-A**, 2, 7; **20-B**, 1, 5, 6, 11.

Day 2: Molecular Luminescence Techniques

Chapter 18: We will review any questions from pp. 387-397.

Chapter 19: Sections 19-5 and 19-6 are commonly used in biochemistry. Give these a read.

Chapter 20: We will cover the material on lasers today (pp. 426-428).

Problems: **18-21**, 22, 23, 24, 25; **19-16**(in class), 17, 18, 19.

Day 3: Potentiometric Methods

Chapter 15: This is mostly new stuff. In class we will learn how to construct a simple ion selective electrode for detecting silver. Many potentiometric sensors and drug delivery systems are now being used in medicine such as in situ glucose sensors for diabetics. pH measurements are arguably one of the most important measurements in all of biochemistry and ion selective electrodes are used extensively for clinical measurements. Section 15-8 is interesting because solid-state electrodes offer the potential (no pun intended) for implantable electrodes for in-vivo monitoring.

Demonstration: Ag electrode construction

Problems: **15-D**, 5, 6, 13, 15, 16, 20, 22, 24, 26, 29, 30, 31, 36, 37.

Day 4: Electroanalytical Techniques

Chapter 17: Though this chapter covers a host of electroanalytical techniques, we will focus mostly on fundamentals (pp. 348-353), and amperometry and voltammetry (pp. 357-369). Increasingly, bioanalytical papers are employing the technique of amperometry and cyclic voltammetry and though electroanalytical techniques are not used as often in biochemistry labs as techniques employing separations and spectrophotometry, the principles involved are relevant and interesting. This is also the first time we will discuss kinetically controlled measurements. The principles of diffusion that govern the kinetic control are very important in biochemistry! Much of the material in this chapter follows nicely from the material on diffusion that we covered in the separations chapter.

Problems: **17-G**, 3, 19, 20, 22, 23, 25, 27, 28, 31