Summary 12 (11/15 ~ 11/21)

Concepts & Definitions:
Column chromatography; planar chromatography; chromatogram; stationary & mobile phases; packed & capillary columns; retention time (t_R) and dead time (t_M); distribution constant (a.k.a: partition ratio) (K); capacity factor (k'); selectivity factor (α); resolution (R_s); theoretical plates; plate height; van Deemter equation/plot; eddy diffusion; longitudinal diffusion; eluent; the general elution problem; solid support material in GC columns; column bleeding; packed column; open tubular column; WCOT; SCOT

Questions & Calculations:
- There are a lot of symbols used in this part of material. Make sure that you know what they are and how they are used.
- What variables are likely to affect the α value for a pair of analytes?
- How can we manipulate the capacity factor for a solute?
- What kinds of information are contained in chromatograms?
- What is the plate theory? How does each component characterize a column?
- How to extrapolate information about plate height and number of plate from a chromatogram?
- What is the van Deemter equation and what parameters can be optimized using a van Deemter plot?
- What are the 3 factors which cause band broadening in chromatography?
- What is the general elution problem? What is the solution to this problem?
- Calculate k', H, N, R and α from relevant data (t_M, t_R, W, L). Calculate the effect of changes of L on R, N, and t_R.
- Describe how a split/splitless injector is used with a capillary column.
- Describe a typical temperature program.
- What are some of the desirable characteristics of GC detectors?
- What are the advantages of capillary columns over packed columns?
- What determines the order of elution for analytes with similar polarity?
- Sketch and describe the operation, sensitivity, dynamic range and selectivity of the two major types of GC detectors: TCD, FID.

Homework:
26-1 (read); 26-2; 26-3; 26-10; 26-12; 26-13; 26-14; 26-21; 26-22; 27-10; 27-15; 27-21; 27-22