Preview Sheet for Test 4 and Final, Friday, May 6, 7:45 a.m. to 10:15 a.m.

Test 4 (50%)

- Chapter 23; references to Chapters 24 and 25 in class
- Lectures from 4/18 through 5/2; Problem Set 8
- Material covered the week of 4/13 will be on the final only

Final (50%)

- All major topics this semester: gravimetric analysis, statistics, activity and solubility, spectroscopy, systematic treatment of equilibrium, acid-base chemistry, titrations, extractions, and chromatography

Instructions before starting the test:

1. Write your name in the space above and on the backs of pages 2-11.
2. Your exam booklet should have **twelve** pages total, with questions on pages 2-11, and a periodic table and other reference data on Page 12. Check to see you have 12 pages now. If you do not, ask for another copy of the exam.
3. You may tear off Page 12 if you wish, but be careful not to remove the staple.
4. **You may use as an additional reference a single sheet of 8.5"x 11" paper, both sides of which you may fill with information.**
5. Part 1 of this test, which is worth 50 points, consists of a series of short essay questions focused on extractions and chromatography. Explain all relevant points completely and succinctly.
6. Part 2 of this test, which is worth 50 points, consists of 20 multiple-choice questions covering all major topics covered this semester. Each question is counted equally in determining your final exam score. Circle the best response to each question. You will not be penalized for incorrect answers. You do not need to justify your answers, and no partial credit will be awarded.
7. This exam will not be handed back, but it is your prerogative to come to my office to look over your exam after it is graded.
8. You may start this exam as early as 7:45 a.m. You must turn in your exam by 10:15 a.m.

Also note the formulas you will be given on the exam:

$$q^n = \left(\frac{V_1}{V_1 + KV_2}\right)^n \qquad D = K + \frac{KK_a}{[\mathrm{H}^+]} \qquad k_i' = \frac{t_i'}{t_m} = K_i \frac{V_s}{V_m} \qquad \alpha_{ij} = \frac{t_j'}{t_i'} = \frac{K_j}{K_i}$$

$$\frac{S_i}{S_{std}} = F\frac{[\mathrm{i}]}{[\mathrm{std}]} \qquad \Re_{ij} = \frac{\Delta t_r}{\overline{w}} = \frac{\sqrt{N}}{4}\left(1 - \frac{1}{\alpha_{ij}}\right)\left(\frac{k_j'}{1+k_j'}\right) \qquad N = \frac{L}{H}$$

$$H = \frac{\sigma^2}{x} = A + \frac{B}{u_x} + Cu_x$$

It is your responsibility to write on your reference sheet other possibly useful equations.