

Updated Information for Students Taking the Final Exam (extracted from last musings, but with correct number 25 on question types)

21. Final Exam. The final exam is scheduled for Saturday, May 15 from 9 a.m. until noon. The exam will consist of 60 equally weighted multiple-choice questions that I have listed twice in previous musings. The time limit for the exam is three hours but you should not be as rushed as on regular exams. As I have mentioned before, there can be no make-up or time changes allowed. However I will allow incompletes in cases where a non-academic issue arises.

22. The final exam locations are in Welch Hall. Please go to the following rooms based on your last name:

Last name K-Z in Welch 2.224

Last name A-J in Welch 1.316

23. Lunches with Dave—review for the final exam: There can be no regular help sessions during final exam week—those classrooms are now used for final exams. However I enjoy your companionship so much that I will offer review sessions the three days before the final. During each session I will review, by question type, a subject area from the course as it relates to the final exam:

- Wednesday 5/12 Welch 3.502 from noon to 1 p.m. Questions from exam 1
- Thursday 5/13 Welch 3.502 from noon to 1 p.m. Questions from exam 2
- Friday 5/14 Welch 3.502 from noon to 1 p.m. Questions from exam 3

24. Additional grading information for those taking the final exam:

- Don't worry about which grading scheme I will use. If the final exam for everything gives you a higher score, I will use that. If the cumulative score with the final gives you a better grade, I will use that instead.
- Don't worry about cutoffs varying from grading scheme to grading scheme. Across the board I am giving back 3% on every grade cutoff as was described in the
- I will have seen almost 100 people since spring break about doing well on the final. Let me encourage you to do what I have suggested so you can greatly improve your grade for the course. Many of you will see a profound change in how you have been performing in this class—last fall 40 students aced the final after having Cs, Ds and Fs. This could be you.

The 60 questions on the final exam

Physical Equilibria

1. Theory: temperature and physical equilibria
2. Theory: dissolving gases, liquids, solids
3. Theory: dissolving gases, liquids, solids
4. Ranking: miscibility of liquids
5. Problem: phase diagram navigation
6. Calculation: ΔH for heating across phases
7. Calculation: vapor pressure in binary system
8. Calculation: Clausius Clapeyron
9. Ranking: Van't Hoff and solution conc.
10. Calculation: colligative property

Chemical Equilibria

11. Setting up K from equilibrium expression
12. Calculation: equilibrium concentrations from K
13. Problem: Reaction direction from Q and K
14. Problem: LeChatelier and reaction direction

Water Equilibria

15. Temperature dependence of K_w
16. Ranking A/B strength from K values
17. Approximations of A/B equations
18. Simple A/B calculation (strong, weak, buffer)
19. Simple A/B calculation (strong, weak, buffer)
20. Identifying buffers (after neutralization)
21. Buffer neutralization calculation
22. Identifying features of a titration curve
23. Titration strong A/B with strong A/B
24. Titration weak A/B with strong A/B to buffer regions
25. Titration weak A/B with strong A/B to endpoint
26. Estimating solubility from K_{sp} values
27. Calculating molar solubility from K_{sp}
28. Common ion calculation, K_{sp}
29. Equilibrium expressions for a polyprotic acid
30. Amphiprotic polyprotic acid calculations
31. Mass and charge balance
32. Equilibria Calculations: dilute solutions

Questions on Electrochemistry

33. relating E, ΔG and K
34. balancing redox equations
35. ranking oxidizing and reducing agents
36. stoichiometry calculation from current
37. interpreting electrochemical cell diagrams
38. cell convention: electrolysis versus voltaic
39. understanding standard reduction potentials
40. calculating cell potentials (not Nernst)
41. calculating cell potentials (Nernst)

Question Types for Kinetics

42. assigning rate expressions
43. calculating reaction rates
44. units of rate constants
45. method of initial rates
46. integrated rate law calculation
47. extracting information from straight line plots
48. kinetic theory
49. Arrhenius equation theory
50. combined Arrhenius calculation
51. reaction mechanisms
52. E_a and energy profiles
53. Famous catalysts

Descriptive Chemistry

54. properties and reactivity of main group elements
55. properties and reactivity of main group elements
56. properties and reactivity of main group elements
57. famous names of chemical manufacturing processes
58. naming organic molecules
59. organic polymer chemistry
60. biomolecule structure