

Brief Musings with Exam 2 information—March 31, 2009

1. There is a second exam coming up on Thursday evening. I have provided the question types for it and had a review on them Sunday night. The notes from that review are found on my lecture notes web page. A format and procedure for exam 2 as well as the question types and equation sheet are found at the end of the musings. Here are a few highlights:

- The exam will be Thursday evening from 7:30 till 9:30 pm. You get 120 minutes sharp.
- Exam location: Last name **A-K**, WEL 2.224. Last name **L-Z**, BUR 106
- You will be given a sheet of equations and constants and a periodic table (found at the end of the musings).
- A make-up exam will be given on Sunday evening from 6 to 8:00 pm in Welch 2.224 for those with conflicts.

2. Remember to be getting your extra credit number one in. I will provide extra credits 2 and 3 in the musings next Tuesday.

3. Two practice exams have been generated. One is in the portal and one in on my web site under the worksheet links. I can safely say that if you follow the leads generated in these two documents you will be doing yourself a great favor in preparing for what is undoubtedly the most difficult exam given each year in general chemistry.

4. Public Service Announcements.

- Pratham, a world-wide organization that contributes towards universalizing primary education, has the goal of ensuring that "every child is in school and is learning well". Over a 9 year period Pratham has reached out to a million children. An accelerated learning method, in which an unlettered child starts reading and computing basic mathematics in 3 weeks, has been in use since late 2002 and has taught over 160,000 children since then to become literate. The Austin chapter is hosting an Ultimate Frisbee tournament on Sunday, April 5th at the IM Fields from 11-4. Sign up with a team of 5 members! The cost is \$10 a person, and there will be free T-shirts and food, and prizes for 1st and 2nd place. Register at prathamaustin.org, at Jashan on Friday April 3rd, or at the Forty Acres Fest this Saturday!
- The UT Learning Center is currently accepting applications for the position of tutor for the Fall 2009 semester. The UTLC hopes to draw from a large pool of qualified students who are interested in tutoring here at UT. A part-time job as a tutor for the UTLC has many benefits for your students. For qualified students who are seeking employment on campus, a tutoring position provides a great opportunity to work at a centrally located place (Jester Center) with working hours that conform to the student's academic schedules. This position also allows students a great opportunity to strengthen their background academic skills, while continuing their education. Many educators often suggest that the best way to learn something well, is to teach it.
 - The pay starts at \$11 / hr with a flexible work schedule
 - Students of any college-level classification with an avg. GPA 3.0 or better are welcome to apply.
 - To learn more, see: www.utexas.edu/student/utlc or call: 471-3614

5. Poetry corner. Spring is here—I saw red buds in the redbuds. Rebirth and all, I should be happy but even rebirth reminds me that I am one spring season closer to death. To help spring along I am offering up a couple of poems about spring. One is by a favorite poet of mine, Gerard Manley Hopkins, (though this one is way too positive to be a personal favorite) and for the cynics in the world, spring from a slightly skewed perspective by Edna St. Vincent Millay.

Spring --Gerard Manley Hopkins
Nothing is so beautiful as spring--
When weed in wheels, shoot long and lovely and lush;
Thrush's eggs look little low heavens, and thrush
Through the echoing timber does so rinse and wring
The ear, it strikes like lightening to hear him sing;
The glassy peartree leaves and blooms, they brush
The descending blue: that blue is all in a rush
With richness; the racing lambs too have fair their fling
What is all this juice and all this joy?
A strain of the earth's sweet being in the beginning
In Eden garden--Have, get, before it cloy,
Before it cloud, Christ, lord and sour with sinning.
Innocent mind and Mayday in girl and boy,
Most, O maid's child, thy choice and worthy the
winning.

Spring -- Edna St. Vincent Millay
To what purpose, April, do you return again?
Beauty is not enough,
You can no longer quiet me with the redness
Of little leaves opening stickily,
I know what I know,
The sun is hot on my neck as I observe
The spikes of the crocus,
The smell of earth is good,
It is apparent that there is no death.
But what does that signify?
Not only underground are the brains of men
Eaten by maggots,
Life in itself
Is nothing,
An empty cup, a flight of uncarpeted stairs.
It is not enough that yearly,
Down the hill,
April, Come like an idiot, babbling and strewing flowers

And I have no idea what this is, but here is a poem written by one of you all.

Get a Room

As I sit here in chem,
I stifle a smile
I cant help but to notice
Some largely false guile
Always whispering and talking
Giggling with glee
Oh how excited
This awkward couple must be.
They think they are sneaky
But we all know
These mild mannered gestures
Are not hollow.
Leans over to her
All up in her space
Oh how he wants
To plant a kiss on her face.
And she loves it!
She eats it up!

But pretends not to agree
Yet all her body language
Still points at he.
How he hates to get up
In the middle of class
Of leaving her side,
But he is always back fast.
Some day they'll have kids
And I can already tell
They will love chemistry
And be as weird as hell..
But that's okay
The "fam" is endearing
Such a happy life
They shouldn't be fearing.
They'll work in a lab,
Living life not so lavished
And this is the love life
Of Vanessa and Travis

CH 302 Exam 2 Procedures: Format and Administration

Exam format:

1. A major CH302 exam covering Chapters 8 through the beginning of 10 will be administered Thursday, April 2, from 7:30 till 9:30 pm. The exam will be worth 180 points. Only problems similar in content and difficulty to those from quizzes and worksheets will be included on the exam. Many of the problems are more challenging than the quiz questions.
2. Test structure: The exam will consist of 30 questions with each question worth 6 points. Questions are in a multiple-choice format. Look below for an exact breakdown of problem types.
3. In addition to the problems, you will be provided a bubble sheet, a table of the elements, and a list of useful equations and constants. Plenty of space for working problems is provided on the exam. Do not bring your own scratch paper.

Exam Administration: READ THIS CAREFULLY. IF YOU DO NOT FOLLOW PROCEDURES, YOU MAY NOT BE ALLOWED TO TAKE THE EXAM. The supreme rule for my exams: everyone has the right to an optimum test-taking environment. I am less concerned with cheating than I am with you making life miserable for others taking the exam. All of the rules for this exam are constructed with this in mind.

1. Exam location: Last name A-K, WEL 2.224. Last name L-Z, BUR 106 ***** Burdine is a mess to get to these days because of renovation so plan ahead to keep yourself out of the labyrinth of fencing that takes you everywhere except to Burdine. Also, if you go to the wrong room, you will not be allowed to take the exam. There is only enough seating for the students as listed above.
2. Exam start time: 7:30 pm. We may decide not to administer the exam to late arrivals if it becomes too disruptive to those taking the exam. Once you start the exam, you may not leave to take the make-up. You must turn in scantron with validated identity.
3. What you may bring to your seat for the exam: number 2 pencils, calculator (I don't care what kind you bring), something to drink. What you may not bring to your seat: anything else including coats, food, back packs, books, paper, portable audio devices. If you must bring them to class, place them at the bottom of the class room before the exams begins.
4. During the exam, the TAs will be available to answer questions. Raise your hand and one of us will come to help you as best we can. Do not leave your seat unless you are finished and are leaving the room.
5. When you leave, do so quietly. AS YOU LEAVE YOU MUST SHOW YOUR UT IDENTIFICATION when you turn in your exam. Make sure your name, special code and SSN are bubbled in.
6. Exam finish time 9:30 pm. You will be given fair warning that the exam is about to end so you can start guessing on questions you don't know. I WILL NOT TOLERATE ANYONE WRITING AFTER YOU ARE TOLD TO PUT DOWN YOUR PENCILS. Anyone who is observed to be writing on their exam after the exam ends will be assumed to be cheating and will receive a 0 for the exam and will face additional academic penalties. READ THIS AGAIN IF YOU DON'T UNDERSTAND. I WILL NOT TOLERATE ANYONE ANSWERING QUESTIONS AFTER THE EXAM STOPS AT 9:30 PM.
7. If all goes well the exam scores will be posted by Thursday morning. Please don't hassle us if they are not up right away. We are doing our best.
8. If you have any special considerations please contact me immediately by e-mail so we have documentation.
9. Responsibility. There is an increasing tendency for you to think you can be irresponsible and mommy or daddy will take care of you in class. I am not your father and Travis is not your mother. So your decision to show up unprepared for quizzes and exam without sharpened pencils or a calculator is not our problem. I will have some pencils and some calculators available because the lower division office is nice, and I will look after folks whose batteries die. But if the collection of calculators I bring to class is runs out, you are on your own.

Exam 2: 30 question types

1. Calculating simple buffers
2. Identifying buffers (after neutralization)
3. Ranking acidity and basicity based on K
4. Buffer capacity
5. Buffer neutralization calculation
6. Identifying features of a titration curve
7. Titration calculation
8. Titration calculation
9. Estimating solubility from K_{sp}
10. Calculating molar solubility from K_{sp}
11. Common ion calculation
12. Selective precipitation
13. Approximations of acid base equations
14. polyprotic acid equilibria
15. polyprotic acid calculations
16. Mass and charge balance
17. Setting up complex equilibrium problems
18. Equilibrium expressions for a polyprotic acids
19. Equilibria Calculations: dilute solutions
20. Equilibrium Calculations: sulfuric acid case
21. Equilibrium Calculations: weak polyprotic acids
22. Balancing redox reactions (in acid or base)
23. Balancing redox reactions (in acid or base)
24. Ranking oxidizing and reducing strengths
25. Assigning EC cell nomenclature
26. Assigning EC cell nomenclature
27. Calculating E_{cell} at standard conditions
28. Relating E, ΔG and K
29. Stoichiometry calculation from current
30. Calculating cell potentials (Nernst)

CH302 Exam 2 Spring 09 Equations and Constants

Constants:

$$F = 96500 \text{ C per mole } e^{-1}$$

$$\text{Amp} = 1 \text{ Coulomb/second}$$

$$R = 8.314 \text{ J/mol K}$$

$$R = 1.987 \text{ cal/mol K}$$

$$N = 6.02 \times 10^{23}$$

Electrochemistry equations

$$E^{\circ} = E^{\circ}_{\text{cathode}} - E^{\circ}_{\text{anode}}$$

$$E = E^{\circ} - (0.0592/n) \log Q$$

$$Q = [C]^c [D]^d / [A]^a [B]^b E^{\circ}_{\text{cell}} = RT \ln K / nF$$

$$\ln K = nFE^{\circ}_{\text{cell}} / RT$$

$$\Delta G^{\circ} = -RT \ln K$$

$$\Delta G^{\circ} = -nFE^{\circ}_{\text{cell}}$$

$$i = C/t$$

Equilibrium Equations

$$\text{pH} = -\log[\text{H}^+]$$

$$\text{pOH} = -\log[\text{OH}^-]$$

$$\text{pK}_a = -\log K_a$$

$$K_a = [\text{H}^+][\text{A}^-]/[\text{HA}]$$

$$K_w = [\text{H}^+][\text{OH}^-] = 10^{-14} \text{ (@ } 25^{\circ}\text{C)}$$

$$K_w = K_a K_b$$

$$\text{pH} + \text{pOH} = 14$$

$$\text{pK}_w = \text{pK}_a + \text{pK}_b = 14$$

$$[\text{H}^+] = (K_a C_a)^{1/2}$$

$$[\text{OH}^-] = (K_b C_b)^{1/2}$$

$$[\text{H}^+] = K_a (C_{\text{HA}}/C_{\text{A}^-})$$

$$[\text{OH}^-] = K_b (C_{\text{A}^-}/C_{\text{HA}})^{1/2}$$

$$[\text{H}^+] = (K_{a1} K_{a2})^{1/2}$$

$$[\text{H}^+]^2 - [\text{H}^+] C_A - K_w = 0$$

$$[\text{H}^+]^3 + K_a [\text{H}^+]^2 - (K_w + K_a C_{\text{HA}}) [\text{H}^+] - K_a K_w = 0$$

$$K_{\text{sp}} = [\text{B}]^b [\text{C}]^c$$

