Spring 2009 CH 302 Random Musings—March 24, 2009

1. Welcome back from Spring Break. One of the things that will amaze those of you new to college is how rapidly the last half of the spring semester disappears leading to final exams. For many of you it will be the most challenging academic experience of your life if you are in a bunch of science courses. I still vividly recall my own experience that first spring semester trying to do well in chemistry, calculus, biology, chemistry lab and biology lab plus two liberal arts courses. I don't think I slept the week I had five finals in three days. So just strap on a seat belt and enjoy the ride. It will make what comes later in college seem like a walk in the park.

2. Starting four years ago I decided that my second round of children would not grow up thinking that spring break was when your dad stayed home and caught up on his e-mail. So beginning with New Orleans, and then the Smokey Mountains, and then New York, and now a beach in Destin, Florida, my spring breaks involve carting a very large family around in a minivan somewhere far from home. Below are photos of Andrew, post-burial, Maddie being buried by Nate Dog and Sam, and the family on a beach as a pirate ship passes by.

By the way, it was my first spring break when I hung out where the college kids hang out. Just the family and a million frat kids from southern schools. And I don't mean to demean their partying nature, but from what I could tell, it was mostly a bunch of kids lying on a beach, playing volleyball, and barbequing while drinking light beer. Seriously, is all that MTV over-the-top partying debauchery contrived--or are southern frats a bunch of losers like CNS students?

3. And how do I know CNS students are losers? Because I read your extra credits, and for the most part, 90% of you simply hung out with your families. I have enjoyed many of your responses, here is one I found especially amusing:

> *You see when I went to school I bought my girlfriend a beta fish. She loved it and named it Squirt. It has been a long time overdue but the fish finally died this spring break. As I drove to see her at her college she called me, her voice sad and forlorn. Squirt was dead, and this was my chance. I told her to wait to flush him, because this was the opportunity of a lifetime. When I arrived I surveyed the lifeless body of her fish, both eyes were protruding and red looking upside-down from a glass of crystal clear water. I asked if she had changed the water of the tank recently. She had the night before, and Squirt paid the ultimate price for it. I sat her down and looked deep into her eyes, "Baby, the reason your fish died was because of the osmotic pressure difference between Squirts body and the water surrounding him. When you changed his water it rushed inside him and essentially blew his tiny fins to that big toilet bowl in the sky." With large sad eyes she asked, "Why would say something like that now?" I sighed knowing I would pay full price for the next words, "Because if I get you to say that you had no idea chemistry was interesting I get 3 extra credit points on my final exam….." Then we went and bought her another fish.*

4. So here it is, a final reminder of the EC instructions for the 276 of you who haven't yet turned it in. Note the looming deadline.

I have promised that there will be three extra credit opportunities this semester that will permit you to lower the cut scores for grades by up to three percent (one percent for each extra credit submitted.) Here is the first one.

Extra Credit 1. To earn 1% of your course grade that you can add to your point totals for the semester, complete the assignment below and follow the specific instructions given. This EC can be used to calculate exemptions. Depending on your method of grading, 1% will be worth 7 points for exemption, 10 points for overall course grade or 3 points if the final counts for everything.

Procedure:
- Complete the assignment below.
- Write it up (probably 100 words or so, but write as much as you want to tell the story.
- Submit it to my e-mail address: **dalaude@mail.utexas.edu**
- IMPORTANT. You must title the extra credit: **EC1s09 Spring Break**
- (If you do not use this EXACT subject you will not be filtered into the file from which I assign extra credit.)
- Due Date: Friday, March 27 at 11:59 pm.. I am going to be strict about the deadline this semester. You will receive an e-mail reminder over the break and one in the musings afterward.

Extra Credit Assignment:

> During spring break I want you to teach a science-hater something interesting about chemistry that you learned in this class. To get the points, the person you teach has to say to you, "gee, I had no idea chemistry was that interesting" when you have finished (you can make them say it even if they don't mean it.). You can choose what you teach but it should be something of interest and utility that you have learned from your experiences with chemical and physical equilibria.

5. As I indicated in an e-mail over the weekend, Quiz 4 is on Thursday and will cover the 8 question types below:

- assigning oxidation numbers
- balancing redox reactions
- identifying strongest oxidizing or reducing agent
- charge calculation in stoichiometry
- standard E_{cell} calculation
- electrolysis reactions
- cell nomenclature
- relationship of E to G to K

Two practice quizzes have been written in support of this quiz which I intend to be really easy, given the short time frame for gearing up after spring break. So really pay attention to the practice quizzes (the one in the portal and the TA quiz posted with the worksheets) to know that you are in fact prepared.

6. Travis will be holding a review session for Quiz 4 in Welch 2.224 (our lecture hall) from 7-8 tonight. I have it on good authority that these are valuable events.

7. New course materials found, or to be found, under the worksheet link:
   - Just before the break I posted a delightful 30 multiple choice question survey of the kind of equilibrium calculations (acid/base and solubility) you would be expected to see on the upcoming exam 2.
   - A brief worksheet from 2008 on how to balance a redox reaction.
   - A very nice survey of relatively qualitative electrochemistry from 2008 that teaches the basics of what you will do on exam 2.
   - A collection of more quantitative electrochemistry problems from 2008 that you should be able to do after the lectures this week
   - By Thursday: a brand new20 question survey of electrochemistry problems
   - By Sunday a new practice exam 2 from the TAs

8. Here are the certain 30 question types (these were posted before break and there have been no changes)
   1. Calculating simple buffers
   2. Identifying buffers (after neutralization)
   3. Ranking acidity and basicity based on K values
   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 acid
   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 Ecell at standard conditions
   28. Relating E, ΔG and K
   29. Stoichiometry calculation from current
   30. Calculating cell potentials (Nernst)

9. Undergraduate Research Forum. I'm big on doing and since I am not your father so you can listen to me when I say that your education here at UT will be mightily improved if you take the bold step of deciding to engage in an active learning environment. The best such environment, of course, is found in one of the hundreds and hundreds of research labs where people are curing cancer and figuring out how old the universe is. On Friday, April 17 right outside this room, about 150 of your undergraduate peers in the College will be displaying their efforts at original scientific research. You should wander through and be amazed that people just like you are doing all kinds of science that you are just beginning to fathom right now. Use this as motivation to get started yourself—I believe it is the principle reason to go to a large university like UT—surely it isn't the machine graded exams. For more information on the research forum go to:

http://cns.utexas.edu/current_students/research/forum.asp

.

10. Extra credit number 2 is coming soon. Okay, so some of you remain unconvinced that you should spend time staring at posters about science that might make you feel inadequate compared to your peers. Well what if I offered up 1% of your grade to go to the poster session, find a poster you like, talk to the person standing in front of it for 5 minutes, and then going home and e-mailing me about your experience. More details to follow but the procedure for getting credit will be the same.

11. Poetry Corner. So now that I am on my research kick, I take a time out from regular poetry to read some prose from a scientist's scientist, C. P. Snow, who is describing that warm tingly feeling he would get in the lab. If you can of well up as I read this, maybe earning a graduate degree in scientific research is the course in life you should chart.

And so for weeks I was alone in the laboratory, taking photographs, gazing under the red lamp at films which still dripped water, carrying them to the light and studying them until I knew every grey speck on them, from the points which were testing my structures down to the flaws and scratches on the surface.

Then, when my eyes tired, I put down my lens and turned to the sheets of figures that contained the results, the details of the structure and the prediction I was able to make…For days my predictions were not only vaguely right, but right as close as I could measure. I still possess those lists of figures, and I have stopped writing to look them over again. It is ten years and more since I first saw them and yet as I read:

Predicted	*Observed*
1.435	*1.44*
2.603	*2.603*

and so on for long columns, I am warmed with something of that first glow….It was as though I had looked for a truth outside myself, and finding it had become for a moment part of the truth I sought; as though all the world, the atoms and the stars, were wonderfully clear and close to me, and I to them, so that we were part of a lucidity more tremendous than and mystery

C.P. Snow,
The Search

12. Poetry Corner, Part II: A Spring Break postscript on the dangers of not going to your grandmother's for spring break.

The Day After Spring break

The day after spring break
And all through my mind
No brain cells are functioning
I have begun to unwind

All the things that I did
In the name of fun
Have landed me in this cell
To think over what I have done

I didn't do anything bad
I just had one drink
How am I supposed to know
That would make me lose my ability to think

Apparently one drink's enough
To make me violent
The only thing I remember hearing is
"You have the right to remain silent"

Now I sit in this cell
In some Mexican jail
Hey Dr. Laude
Can you please post my bail?