

CH 302 Random Musings—March 24, 2011

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 five 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 then a beach in Destin, Florida, and then New York, my spring breaks involve carting a very large family around in a minivan somewhere far from home. This year it was a condo in Panama City and below is the usual beach at sunset picture of Maddiegirl (9), Nate Dogg (6) (by the way, I named my son after the rapper who died during spring break—kind of sad), Sam I Am (11), Andrew (2) (who has no nickname because we named him quick so we could leave the hospital) and my wife (>18).



This was my second spring break when I hung out where the college kids hang out. Just the family and a million frat kids from southern and mid west 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? (p.s. When you have taught about 20,000 students who are currently between the ages of 18 and 24, it is impossible not to have a bunch of them walk up to you on the beach and say, "Hey Dr. Laude, I used to be in your class. Here is a hint—drunk people can't tell that sober people are sober, but sober people can tell that drunk people are drunk.)

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.

3.5 I heard several stories about the pH of water that made me cringe. Specifically this: Neutral water is neutral, no matter the pH. So you can say the ice water had a basic pH just because it has a pH above 7. The definition of neutrality is the $\text{pH} = \text{pOH}$ and has no relationship to the actual value.

4. So here it is, a final reminder of the EC1 instructions for the 276 of you who haven't yet turned it in. Note the looming deadline is the end of the month of March.

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: **EC1s11 Spring Break uteid**
- (If you do not use this EXACT subject you will not be filtered into the file from which I assign extra credit.)
- Due Date: any date in March, 2011. 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. QUIZ 4 UPDATE As I indicated in an e-mail over the weekend, being realistic about what we can hope to accomplish, I am changing the content for exam 2, and limiting it to only water chemistry. Consequently Quiz 4 on Tuesday next week will cover the following question types.

Common ion calculation (K_{sp})

Selective precipitation (K_{sp})

Mass and charge balance

Equilibria Calculations: dilute solutions

Polyprotic acid calculations (estimates using alpha diagrams)

Equilibrium Calculations: sulfuric acid case

Equilibrium Calculations: weak polyprotic acids (amphiprotic case)

Equilibrium Calculations: weak polyprotic acids (non-amphiprotic case)

I have written up some review notes on this subject that I presented in class on Tuesday. They are found with the lecture notes on my archival web site.

Two practice quizzes have been written in support of this quiz—I e-mailed one of them to you the other day. I will post the second practice quiz tonight.

Important Update for Exam 2.

6. The exam will be held on Thursday, April 1. It will be two hours in length from 7:30 till 9:30. It will be calculator free. There will be more information on the exam procedure in next week’s musings.

7. I will have a review session for the exam next Sunday evening from 9 till 10. **(NOTE THE TIME CHANGE FROM MONDAY.)** Travis will have one on Tuesday from 9 till 10. The make-up exam will be the following Sunday evening.

8. Exam Supplemental Materials. I will post a practice exam 2 on Friday night, another TA practice exam 2 on Sunday. On the video clip front, all of my video clips through the material on water chemistry are now posted. I have also posted all of the worksheet video clips through 8. Miranda will get the other clips for worksheets 9 and 10 to me by later in the week and I will e-mail as they are put on line. Do appreciate the enormous amount of work that the TAs and I are doing to turn this class into a “hybrid course” that marries the value of face to face lectures and discussion sections with on-line support material. It is a lot of work and we are doing it on the fly so it will not always be the case that it is available when you want it. But we are trying.

9. Here are the certain 20 question types for exam 2—with elimination of electrochemistry questions. The electrochemistry material will appear on the third exam which will now be 40 questions in length.

1. Identifying buffers (after neutralization)
2. Ranking acidity and basicity based on equilibrium constants
3. Buffer neutralization calculation
4. Identifying features of a titration curve
5. Titration calculation
6. Titration calculation
7. Estimating solubility from K_{sp}
8. Calculating molar solubility from K_{sp}
9. Common ion calculation
10. Selective precipitation
11. Approximations of acid base equations
12. Mass and charge balance
13. Setting up complex equilibrium problems
14. Equilibrium expressions for a polyprotic acid
15. Polyprotic acid equilibria (theory)
16. Polyprotic acid calculations (estimates using alpha diagrams)
17. Equilibria Calculations: dilute solutions
18. Equilibrium Calculations: sulfuric acid case
19. Equilibrium Calculations: weak polyprotic acids (amphiprotic case)
20. Equilibrium Calculations: weak polyprotic acids (non-amphiprotic case)

10. Tragically new material must continue to be presented and it is time to learn about electrochemistry. For those of you confident with the acid base material, I will be posting new worksheets and video clips this weekend. Be aware that quiz 5 will be on electrochemistry so we can get you caught up in knowing the material.

11. Public Service Announcement. The 2011 CNS Undergraduate Research Forum will take place Friday, April 8 from 11am to 3pm, as part of UT's Research Week.

<http://cns.utexas.edu/research/undergraduate-opportunities/undergraduate-research-forum>

12. Undergraduate Research Forum. I'm big on doing and since I am not your father 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 8th 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:

13. 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.

14. 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:

| <i>Predicted</i> | <i>Observed</i> |
|------------------|-----------------|
| <i>1.435</i> | <i>1.44</i> |
| <i>2.603</i> | <i>2.603</i> |

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*

15. 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?