

Spring 2009 CH 302 Random Musings—March 23, 2010—A huge one to get started back up

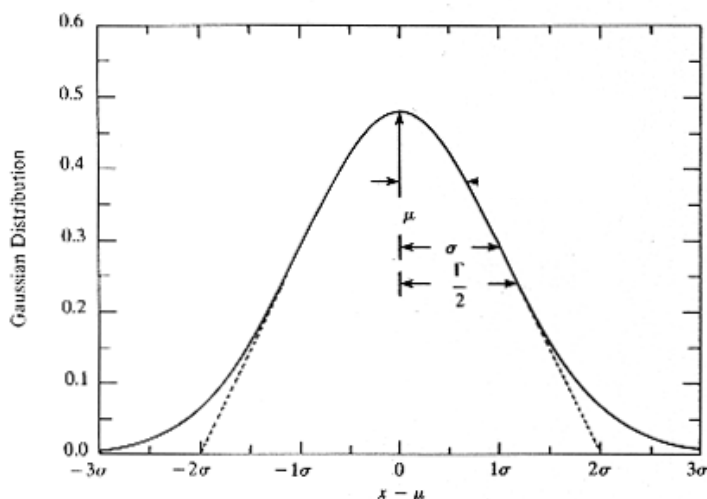
1. Welcome back from Spring Break. One of the things that will amaze those of you new to college is how rapidly the last half of the spring semester disappears leading to final exams. For many of you it will be the most challenging academic experience of your life if you are in a bunch of science courses. 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, my spring breaks involved carting a very large family around in a minivan somewhere far from home. This year it was back to New York and I have no pictures to share. Why? It was the worst spring break of my life— The worst sinus infection of my life and my one year old catching the flu? Or maybe the two days in a dingy Arlington hotel waiting for a plane after a canceled flight? Or five days without luggage? Or midnights spent in dingy Laundromats washing the clothes off our backs because of the lost luggage? Or 2.5 hours in the Lincoln Tunnel when I should have been at my son's Juilliard concert?

But I am a contented man. And here is why.

Dr. Laude's deep thought on the fundamental difference between old people and young people: Very simply, old people have had more chances at stuff--more relationships, more jobs, more vacations--and we get to build this collection of chances into real populations with real distributions—it makes for perspective. Like, “she was in the top half of all the girl friends I have had.” So while youngsters like you have had maybe a couple spring breaks at most, not enough to know all the variations, I have had 30 spring breaks and know the truth. The truth is that when you have done the same thing enough, like spring breaks, you know that half of them have to be the worst half, and half have to be the best half. And the great spring break I had in Destin last year wouldn't be as great if I didn't have the awful spring break I had this year.

Dr. Laude's Spring Breaks fit a Gaussian distribution



The worst spring breaks over here

The best spring breaks over here

And even better, that awful spring break trip I just had made a meal of an average meal of hotdogs and cantaloupe, after I got the family home safe last Friday night, just about the best meal I have eaten in a very long time—at least in the top half of all the meals I have ever eaten.

3. And how do I know CNS students are not the coolest? Because I read your extra credits, and for the most part, 90% of you simply hung out with your families over break. 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.

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: **EC1s10 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: Tuesday, March 30 at 11:59 pm.. I am going to be strict about the deadline this semester.

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, 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 Thursday will cover the following question types.

- ranking solubility from K_{sp}
- common ion solubility calculation
- identifying a buffer after neutralization
- titration of weak A or B with strong A or B
- mass and charge balance in a complex equilibrium expression
- setting up a polyprotic acid equilibrium
- amphiprotic acid calculation
- ranking concentrations of polyprotic acids in solution

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 one the TAs will write that I will post this evening.

6. My office hours this week are in the classrooms because of the upcoming quiz.

7. 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, here are new worksheet links on electrochemistry to get you started.

- 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

Be aware that quiz 5 will be on electrochemistry so we can get you caught up in knowing the material.

Important Updates on Exam 2.

8. 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 but I promise that the math will be variations on powers of ten and will not have the kind of algebra on it that Travis used on quiz 3. For an example of what the math will look like, view my practice exam 4. You will notice that there is not a single problem that isn't easily done in your head since every result ends in a unit pH.

9. I will have a review session for the exam next Monday evening from 9 till 10. Travis will have one on Tuesday from 9 till 10. The make-up exam needs to be rescheduled to Monday evening because of the religious holiday. I will have more details on this, but expect to take it Monday night, April 5. You can always find the details at <http://laude.cm.utexas.edu/courses/ch302/sessionss10.pdf>.

10. I will post a practice exam 2 this weekend in the portal. Travis and the TAs will have a version by Monday evening.

11. Here are the certain 25 question types for exam 2—with a slight expansion of water chemistry and elimination of electrochemistry questions. The electrochemistry material will appear on the third exam which will now be 35 questions in length.

1. Calculating simple buffers (no neutralization)
2. Identifying buffers (after neutralization)
3. Ranking acidity and basicity based on K_a or K_b values
4. Buffer capacity
5. Buffer neutralization calculation
6. Identifying features of a titration curve
7. Titration calculation—Strong with strong
8. Titration calculation—Strong with weak to buffer region
9. Titration calculation—Strong with weak to equivalence point
10. Ranking solubility based on K_{sp} values
11. Estimating solubility from K_{sp}
12. Calculating molar solubility from K_{sp}
13. Common ion calculation
14. Selective precipitation
15. Approximations of acid base equations—competing K values
16. Approximations of acid base equations—concentration effects on error
17. Setting up complex equilibria—number of equations
18. Setting up complex equilibria— mass and charge balance
19. Equilibria Calculations: dilute solutions case
20. Polyprotic acid expressions and equations
21. Ranking concentrations in polyprotic acid solutions using alpha diagrams
22. Polyprotic acid calculation-amphiprotic case
23. Polyprotic acid calculation-weak or buffer case
24. Approximations in polyprotic acid calculations
25. Sulfuric acid calculation

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 16th 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/research/undergraduate-opportunities/undergraduate-research-forum>

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.

15. 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?