

## CH302 Random Musings, March 31, 2011 A Brief Musings—Sad Songs and Exam Hints

0. I want to spend some time on the exam tonight so I will keep this musings short and have a lengthy one next Tuesday when I will provide the question types for the rest of the course including the final exam and the other two extra credits.

1. The quiz 4 results were a 70 which was pretty good. I would have hoped for more like 80—it was a pretty easy quiz. But that was just a warm up—your chance to shine on the exam in hours away.

2. There is an exam coming up tonight. 20 question types on water chemistry that you know backwards and forwards.. Things to know:

- The exam will be Thursday evening from 7:30 till 9:30 pm. You get 120 minutes, sharp.
- Room locations are just like last time: Last name A-L will be Welch 2.224. Last name M-V will be in W. C. Hogg 1.120 and W – Z will be in Welch 2.256.
- You will be given a sheet of equations and constants and a periodic table.
- This is a calculator-free exam. No electronic devices are to be used during the exam, and you may not be in possession of any electronic devices while the exam is in progress.
- A make-up exam will be given the following Sunday evening from 6 to 8:00 pm in Welch 2.224.

2. You don't need to e-mail to let me know. Repeat. You don't need to e-mail to let me know you are taking the make-up on Sunday. You don't need to e-mail to let me know. Repeat. You don't need to e-mail to let me know you are taking the make-up on Sunday. You don't need to e-mail to let me know. Repeat. You don't need to e-mail to let me know you are taking the make-up on Sunday. You don't need to e-mail to let me know. Repeat. You don't need to e-mail to let me know you are taking the make-up on Sunday. You don't need to e-mail to let me know. Repeat. You don't need to e-mail to let me know you are taking the make-up on Sunday.

3. For the make-up exam I will try to make it as consistent with my review materials on question types as I can.

4. A reminder that the extra credit for science haters is due by the time I wake up in the morning.

5. Some things I would be able to do if I was taking this exam:

- You have to be able to separate the standard seven step acid base stuff we are doing from the new material that does not assume approximations. So start acid base question by asking, step 0, can I do the seven step approximation stuff? The answer is yes if  $C$  is high and  $K_s$  are far apart. If no, then it must be one of the several special case problems you know are coming.
- Being able to do the seven step procedure to find a pH is not the same as being able to explain what is happening physically in an acid base system. Titration curve theory, polyprotic acid theory, ranking from  $K_s$ , acid-base approximations, sulfuric acid calculation, the two complex equilibrium questions and the alpha diagram interpretation require you to think, not calculate.
- There are at least three actual calculations of pH on this exam for which the answers provided eliminate all but the correct answer WITHOUT doing a calculation. This only benefits those who know what to look for.
- Do you know how often knowing that  $\text{pH} = \text{pKa}$  is good to know? It directly impacts several answers in providing immediate access to the right answer. So if you see a buffer and it is 1:1 as a starting point in solving a problem, you are very close to an answer already.
- I haven't covered the structure of amino acids specifically, and one will be on the test, so be aware of the following. In an amino acid with two acid base sites (one and acid and one a base) you can have either 2, 1 or 0 protons depending on the pH.
  - HOOC- R- NH<sub>3</sub><sup>+</sup> is most protonated and at the lowest pH (like the H<sub>2</sub>A form)
  - OOC- R- NH<sub>3</sub><sup>+</sup> is the amphiprotic species equivalent to HA<sup>-</sup>
  - OOC- R- NH<sub>2</sub> is the deprotonated form and is found at the highest pH (like the A<sup>-</sup> form)
- You have to be able to back-substitute and will do it twice for problems with quadratic equations on this exam. Set up the equation, know that what you solve for in the equation is what is wanted, and then plug away. Only one answer will make the equality happen. You can solve the quadratic equation as an alternative, but this way will work. Promise.
- There are four solubility problems on the quiz. In order of challenge they are: molar solubility, ranking solubility, common ion and selective precipitation. Before you work one of them, know what it is. They aren't in order.
- PLEASE write down both the solubility reaction and its RICE array AND the full  $K_{sp}$  equilibrium expression on each problem. It will save the guaranteed stupid mistakes when you forget to divide by 4 or take square a number.
- For the selective precipitation problem, look at the bullet just above and appreciate that salts of different types, when compared (like AB versus AB<sub>2</sub>) do not have solubilities that scale proportionally with the  $K_{sp}$  as occurs with acids.

### Bad Science Joke Corner:

A physicist, a biologist and a chemist were going to the ocean for the first time. The physicist saw the ocean and was fascinated by the waves. He said he wanted to do some research on the fluid dynamics of the waves and walked into the ocean. Obviously, he drowned and never returned. The biologist said he wanted to do research on the flora and fauna inside the ocean and walked inside the ocean. He too, never returned. The chemist waited for a long time, until finally he noted and wrote down the observation, "Hmm, so physicists and biologists are soluble in ocean water..."

**Poetry Corner.** If you are wondering if I was a little different from the average college student, use the following as a guide: one of my hobbies in college was typing up the words to really sad songs and putting them on the walls of my room. The weirder thing is that my roommate shared a similar fascination. And we went at this with a vengeance, at the beginning of our sophomore years spending hundreds of hours filling three full walls with hand typed half pages extracted from repeated listening to bad eight-track tapes. Listed below are some of these sad songs. Enjoy.

**I Wish I Had a River-Joni Mitchell**

Its coming on Christmas  
They're cutting down trees  
They're putting up reindeer  
And singing songs of joy and peace  
Oh I wish I had a river  
I could skate away on  
But it don't snow here  
It stays pretty green  
I'm going to make a lot of money  
Then I'm going to quit this crazy scene  
I wish I had a river  
I could skate away on  
I wish I had a river so long  
I would teach my feet to fly  
Oh I wish I had a river  
I could skate away on  
I made my baby cry

He tried hard to help me  
You know, he put me at ease  
And he loved me so naughty  
Made me weak in the knees  
Oh I wish I had a river  
I could skate away on  
I'm so hard to handle  
I'm selfish and I'm sad  
Now I've gone and lost the best baby  
That I ever had  
Oh I wish I had a river  
I could skate away on  
I wish I had a river so long  
I would teach my feet to fly  
Oh I wish I had a river  
I made my baby say goodbye

Its coming on Christmas  
They're cutting down trees  
They're putting up reindeer  
And singing songs of joy and peace  
I wish I had a river  
I could skate away on

**Souvenirs-Dan Fogelberg**

Here is a poem  
That my lady sent down  
Some morning while  
I was away.

Wrote on the back of  
A leaf that she found  
Somewhere around Monterey.

And here is the key  
To a house far away  
Where I used to live  
As a child.  
They tore down the building  
When I moved away  
And left the key unreconciled.

And down in the canyon  
The smoke starts to rise.  
It rides on the wind  
Till it reaches your eyes.  
When faced with the past  
The strongest man cries...cries.

And down in the canyon  
The smoke starts to rise.  
It rides on the wind  
Till it reaches your eyes.  
When faced with the past  
The strongest man cries...cries.

And here is a sunrise  
To set on your sill.  
The ghosts of the dawn  
Moving near.  
They pass through your sorrow  
And leave you quite still...  
Sitting among souvenirs.

### **At Seventeen-Janis Ian**

I learned the truth at seventeen  
That love was meant for beauty queens  
And high school girls with clear skinned smiles  
Who married young and then retired

The valentines I never knew  
The Friday night charades of youth  
Were spent on one more beautiful  
At seventeen I learned the truth

And those of us with ravaged faces  
Lacking in the social graces  
Desperately remained at home  
Inventing lovers on the phone  
Who called to say come dance with me  
And murmured vague obscenities  
It isn't all it seems  
At seventeen

A brown eyed girl in hand me downs  
Whose name I never could pronounce  
Said, pity please the ones who serve  
They only get what they deserve

The rich related hometown queen  
Married into what she needs  
A guarantee of company  
And haven for the elderly

Remember those who win the game  
Lose the love they sought to gain  
Indebentures of quality  
And dubious integrity  
Their small town eyes will gape at you  
In dull surprise when payment due  
Exceeds accounts received  
At seventeen

To those of us who know the pain  
Of valentines that never came  
And those whose names were never called  
When choosing sides for basketball

It was long ago and far away  
The world was younger than today  
And dreams were all they gave for free  
To ugly duckling girls like me

We all play the game and when we dare

To cheat ourselves at solitaire  
Inventing lovers on the phone  
Repenting other lives unknown  
That call and say, come dance with me  
And murmur vague obscenities  
At ugly girls like me  
At seventeen

### **American Tune-Paul Simon**

Many's the time I've been mistaken  
And many times confused  
Yes, and I've often felt forsaken  
And certainly misused  
Oh, but I'm alright, I'm alright  
I'm just weary to my bones  
Still, you don't expect to be  
Bright and bon vivant  
So far a-way from home, so far away from home

And I don't know a soul who's not been battered  
I don't have a friend who feels at ease  
I don't know a dream that's not been shattered  
or driven to its knees  
but it's alright, it's alright  
for we lived so well so long  
Still, when I think of the  
road we're traveling on  
I wonder what's gone wrong  
I can't help it, I wonder what has gone wrong

And I dreamed I was dying  
I dreamed that my soul grows unexpectedly  
And looking back down at me  
Smiled reassuringly  
And I dreamed I was flying  
And high up above my eyes could clearly see  
The Statue of Liberty  
Sailing away to sea  
And I dreamed I was flying

We come on the ship they call the Mayflower  
We come on the ship that sailed the moon  
We come in the a-ge's most uncertain hours  
and sing an American tune  
Oh, and it's alright, it's alright, it's alright  
You can't be forever blessed  
Still, tomorrow's going to be another working day  
And I'm trying to get some rest  
That's all I'm trying to get some rest