September 7, 2005

Dear Chem 104 Students:

Please help me by filling out this survey and turning it in at the end of class today. Your answers will be held in confidence, no one but me will see them, and your answers will have no impact on your grade. I will use these surveys to help me judge the best level at which to present material in class so that I can try to be most helpful to you. I will also be using the information in these surveys to assign balanced teams for the weekly problem solving that we will do during class. If you feel uncomfortable providing me with any information, you can leave a question blank. If you would rather talk with me in person, I am always available during office hours, or you can make an appointment with me.

Thank you.
Prof. Sevian

Name:

Email address (please write neatly):

How often do you check your email?

___ More than once a day
___ Once a day
___ A few times a week
___ Once a week
___ I rarely use email

Below is a problem similar to one from this semester's homework. Please tell me about your confidence level with the <u>mathematics</u> involved in solving this type of problem.

___ The mathematics here are easy for me. I feel very confident with the mathematics in these kinds of problems.
___ I can do these kinds of problems, but the mathematics are a little bit of a challenge for me.
___ I am anxious about these kinds of problems because my skills with mathematics are rusty.
___ Other (please explain):

<u>Problem</u>
What is the pH of an acetic acid/sodium acetate buffer when $[CH_3COOH] = 0.600$ M and $[CH_3COO^-] = 0.700$ M?

<u>Solution</u>

Concentration	$CH\ COOH$	$+ H_2O \Leftrightarrow$	H_3O^+	$+$	CH_3COO^-
initial	0.700		0		0.600
change	$-x$		$+x$		$+x$
final	0.700-x		x		$0.600 + x$

$$K_a = \frac{[H_3O^+][CH_3COO^-]}{[CH_3COOH]} = 1.8\times10^{-5} \quad \textit{therefore,} \quad 1.8\times10^{-5} = \frac{(x)(0.600+x)}{(0.700-x)}$$

This leads to a quadratic equation :

$(1.26\times10^{-5}) - (1.8\times10^{-5})x = 0.600x + x$, which simplifies to $x^2 + 0.600018x - (1.26\times10^{-5}) = 0$

Solving for x gives $x = 2.10\times10^{-5}$ or - 0.600039 (which is impossible because that would produce a negative value for $[CH_3COO^-]$

So, $x = [H_3O^+] = 2.10\times10^{-5}$ *therefore* $\text{pH} = -\log[H_3O^+] = -\log(2.10\times10^{-5}) = 4.68$

PLEASE FILL OUT OTHER SIDE ALSO ➦

Below is a problem similar to one from this semester's homework. Please tell me about your confidence level with the <u>reasoning skills</u> involved in solving this type of problem.

___ The reasoning skills here are easy for me. I feel very confident with being able to form the kinds of arguments required to explain answers for these kinds of problems.
___ I can explain answers for these kinds of problems, but setting out the sequence of reasons is a little bit of a challenge for me.
___ I am anxious about these kinds of problems because my skills with explaining reasoning are a little rusty.
___ Other (please explain):

<u>Problem</u>
Which should have the highest boiling point: methane (CH_4), ethane (CH_3CH_3), or propane ($CH_3CH_2CH_3$)?

<u>Solution</u>
These are all nonpolar molecules. In condensed phases, the only force of attraction for them is London dispersion forces (induced dipole – induced dipole interactions). Since a larger induced dipole can be realized in a larger molecule, then propane would have the largest induced dipoles, and therefore the strongest attractive forces between molecules. Therefore, compared to the others, it would require more energy to break these attractive forces and send a liquid into the gas state. So, propane should have the highest boiling point.

Below is a passage from the textbook. Please tell me about your ability level with <u>English language</u> in understanding this passage.

___ The English language used here is easy for me. I feel very confident in being able to understand what I am reading in this passage.
___ I can understand what I read here, but I need to read it several times and may need to look up a word or two in the dictionary.
___ I am confused by this passage because the English language in it is difficult for me to understand.
___ Other (please explain):

The van't Hoff factor approaches a whole number (2, 3, and so on) only in very dilute solutions. In more concentrated solutions, the experimental freezing point depressions tell us that there are fewer ions in solution than expected. This behavior, which is typical of all ionic compounds, is a consequence of the strong attractions between ions. The result is as if some of the positive and negative ions are paired, decreasing the total molality of particles. Indeed, in more concentrated solutions, and especially in solvents less polar than water, ions are extensively associated in ion pairs and in even larger clusters. [from p. 581 of text]

Please tell me anything else you may want me to know about you in order to help me tailor the course better to meet your needs.