FALL CHEMISTRY 102 2011

SECTION 501 Tuesdays & Thursdays 9:35-10:50am

Dr. Wendy L. Keeney-Kennicutt (kennicutt@chem.tamu.edu)

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public webpage: www.chem.tamu.edu/class/fyp/wkk-chem.html
elearning webpage for grades and turnitin.: elearning.tamu.edu
Second Life (SL) orientation: http://bit.ly/mGWNr1 . In SL, click on my sign to the left of the orientation entrance to be transported to my chemistry SL space.
Office Hours: Mondays 3-6pm, by appointment and whenever you can catch me. .

Welcome to CHEM 102! As the science that describes matter, chemistry is vital to our understanding many of the problems facing our world today from global warming to feeding the world to fighting cancer. Rapid new developments in all of these areas virtually guarantee that chemistry will become even more important in the years to come. Knowledge of chemistry is thus an important ingredient in a liberal arts education, and an essential foundation for a technical education. The ability to communicate that knowledge is also critical in this day and age. So writing about chemistry and topics related to this class will be an integral part of our class. We will also use clickers and do a couple quizzes in Second Life (SL) – an on-line virtual world.

TABLE OF CONTENTS:

I will strive to make this course a meaningful and enjoyable experience for you. Please feel free to call upon me whenever I can be of help. I am giving weekly review sessions on lecture material and our SI leader will be giving weekly sessions. I will be available in Room 116 HELD (in the back) during office hours to answer both laboratory and lecture questions.

Finally, it is important to check your official TAMU email regularly. I will be sending messages to you.

Sincerely,
Dr. Wendy L. Keeney-Kennicutt, Associate Director, First Year Chemistry Program
Presidential Professor for Teaching Excellence & Piper Professor of 2010

MY TEACHING PHILOSOPHY

My teaching philosophy is straightforward: I will be teaching you the way I would want to be taught - with enthusiasm, and with a passion for the subject combined with respect and understanding. My aim is to give each of you every opportunity to do your best in learning chemistry despite our large classroom setting. Chemistry is a subject that I have studied, practiced, taught and enjoyed since I was 17 years old – over 40 years. On my part, effective teaching involves time, dedication, patience, understanding, firmness, and a sense of humor. On your part, effective learning involves your participation inside and outside the classroom.

My job is to encourage you and give you every opportunity to be successful in this class and leave the class knowing some Chemistry. All of the sciences require more work and studying than most of you are used to, and Chemistry is no exception. I have specifically designed this course so that you can do well, even if you bomb an exam, providing you do all the work I assign, both during class and on your own time. The student evaluations on Pick-A-Prof are valid; I do assign a great deal of work: 2 kinds of homework, 3 optional writing assignments using Calibrated Peer Review and Turnitin, and in-class and SL quizzes. However, this is not busy work, made to make your life miserable, but it provides you an opportunity to practice your chemistry skills and earn a good grade aside from the 3 exams and comprehensive final that we will have. This additional work (writing, in-class quizzes and homework) can make up 30% of your grade. So you can be a terrible test taker and still do fine, if you do the work and come to class. I am also allowing you a little leeway in what work you will do for the class.

I know that I'm asking that you do a great deal of work. So, I have incorporated several things to make your life more agreeable.

(1) I do think that you are much better off taking our exams at the scheduled time. My regular exams are about 80% multiple choice and 20% free response and have a review session. However, I know that you are very busy and circumstances can just crop up. To that end, my exam makeup policy is rather lenient. To take my makeup exam, you must send me an email giving me the reason (I expect the truth) for why you want to take the makeup, instead of the regularly scheduled exam. Reasons include the regularly approved university excuses (illness, a school-related trip, etc.), but also having to go to your sister's wedding, staying up all night with a sick roommate, or having your alarm not go off or another decent reason for not being prepared. The slightly more difficult makeups are usually 10 days later, at 4pm on a Friday afternoon and are all free response exams, with no multiple choice.

(2) I am giving you an opportunity to counteract lower test grades. I am assigning 3 writing assignments using Calibrated Peer Review throughout the semester. I will take the best 3 scores out of your 3 writing assignments and your 3 class-time exams and that will become a 4th "exam grade."

(3) The on-line homework (OWL) can count either 20% or 100% of an exam grade. I will calculate your grade both ways and give you the better final average.

(3) I give weekly review sessions every Sunday. I know that Chemistry is probably not your favorite subject. However, with a little help and support, you may surprise yourself as to how well you can do.

(4) Besides my regularly scheduled office hours in my office and in Second Life, I have an open door policy to answer all kinds of questions about the course, homework, lab or anything else. I am a TAMU Mentor and an Ally. I also do pretty well at answering my emails in a timely way.

I hope you'll have a good semester and also learn a little chemistry.

Dr. K :)

GENERAL POLICIES and INFORMATION

I. Plagiarism: Students are expected to be the sole source for any work submitted in their name. The utilization or submission of the work of others as your own is a violation of Texas A&M University scholastic dishonesty policies and is called plagiarism. If you are found guilty, you may receive a 0 on the assignment, an F in the course or worse, as determined by the Office of the Aggie Honor System (aggiehonor.tamu.edu). As commonly defined, plagiarism consists of passing off as one's own the ideas, words, writings, etc., which belong to another. You are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research and knowledge cannot be safely communicated. The teaching assistants in lab specifically look for copied work and will give zeros to work that has been copied. If you have questions regarding plagiarism, please consult the Texas A&M University Student Rules under "Academic Misconduct." on the Aggie Honor System's website (aggiehonor.tamu.edu).

II. AGGIE HONOR CODE

"An Aggie does not lie, cheat, or steal or tolerate those who do."

Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor System. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the TAMU community from the requirements or the processes of the Honor System. This code also applies to "clicker" use. All clicker quizzes should be done only by the clicker owner and no one else.

For additional information please visit: aggiehonor.tamu.edu

On all examinations and appropriate assignments at Texas A&M University, the following Honor Pledge shall be signed by the student:

"On my honor, as an Aggie, I have neither given nor received unauthorized aid on this academic work."

III. Copyright:

The handouts used in this course are copyrighted. By "handouts," I mean all materials generated for this class, which include but are not limited to syllabi, quizzes, exams, lab problems or study sheets, in-class materials, review sheets, and additional problem sets, notes, etc. Because these materials are copyrighted, you do not have the right to copy the handouts, unless I expressly grant permission.

IV. Texas A&M Disability Services (845-1637 and http://disability.tamu.edu/):

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, either temporary (e.g. broken arm) or permanent (including a learning disability), please contact Disability Services in Rm B118 of Cain Hall. If you have any questions, see me.

V. Important Dates (See Due Dates on the Calendar)

August 29:	Monday, First Day of Class
September 2:	Friday, Last day to add/drop courses with no record
October 17:	Midsemester Grades Due.
November 4:	Last day to Q-drop or to officially withdraw from the University.
	Last day to change Kinesiology 198/199 to S/U grade.
November 18:	Bonfire 1999 Remembrance Day.
November 24-25	Thanksgiving holiday
December 5:	Monday. Redefined day. Students attend Friday classes.
	Prep day, classes meet.
December 6:	Tuesday. Last day of Fall classes. Redefined day.
	Students attend Thursday classes. Prep day.
December 7-8:	Reading days. No classes or examinations.
December 9:	CHEM 102, Section 501 Final Exam:
	Friday: 7:30-9:30am, Rm 100 Held

COURSE POLICIES AND PROCEDURES

VI. Required Materials:

(1) OWL (on-line homework) with E-book/YouBook (Chemistry & Chemical Reactivity, 8th Edition; Kotz, Treichel, & Townsend) and full solution manual. You have options.

Visit http://www.cengagebrain.com/micro/tamuchem **to buy your code. There is a link on http://owl.chem.tamu.edu. Follow the directions on Page 3 and 12.**

There is a 2 week trial period so that you can start your homework right away. When you register, you can choose to use the trial period or enter your code.

I know the CengageBrain site is wordy.
In the middle of the page, select your course from the drop-down menu:
Chem 101 or Chem 102 or Chem 101/102 – different choices will appear below.
Ebook and YouBook are the same thing.

Bookstore pricing:

- Kotz, General Chemistry, 8th ed. Full text in Loose-Leaf 3 hole drilled format with OWL/eBook (24 Months) for net $99.00.

Website Pricing

- Chem 101 (split) Loose Leaf text with OWL/eBook (6 month) $ 57.00
- Chem 102 (split) Loose Leaf text with OWL/eBook (6 Month) $57.00
- Full Text Loose Leaf with OWL/eBook (24 Month) $99.00
- OWL/EBook/Solution Manual (24 Month) $89.00
- OWL/EBook/Solution Manual (6 Month) $55.00

. Register your code at http://owl.chem.tamu.edu – see pages 3 and 11.

Hardcopies of the textbook are on reserve at the library.

(2) Calculator suitable to use on lecture exams. May not have multi-line screen (two lines are acceptable) nor extensive memory. (See later discussion.)

(3) **i>clicker2**. Buy at bookstore or on-line and register at www.iclicker.com.
Additional information and rebate info is included on page 8.

VII. Optional Materials:

(1) hardback textbook ("Chemistry & Chemical Reactivity" by J.C. Kotz, P.M. Treichel & J. Townsend, 8th Edition, 2012 ISBN-10: 0840048289 ISBN-13: 9780840048288) can be bought discounted from www.cengage.com/gateway/tamuchem, or better yet, buy it used from Amazon.com or elsewhere. There are copies of it on reserve at the library.

(2) The full solution manual for the 8th Edition of the textbook can be purchased online, but it does come with some of the book options. Use the ISBN number to search textbook sites: ISBN-10: 1111426988 | ISBN-13: 9781111426989.

(3) Visit http://writingcenter.tamu.edu/how-to/ for help with writing (how to write abstracts, grammar, etc.) This link and others are also on our class public webpage.

(4) My notes and old exams are available free on our public website. You can also purchase a bound copy with old exams and answers to multiple choice from COPY CORNER located at 2307 Texas Ave. S in College Station.

VIII. Lecture Reading Assignments:

Lectures are designed to help you in developing an understanding of the material being emphasized. To get the most out of lecture, one should always read the appropriate sections before they are discussed in class. The link to the ebook and solution manual is available through OWL. The setup procedure for getting started is below.

IX. Homework: BOPs and OWL

Written Bonus Opportunity Problems (BOPs): These are study questions from the back of each chapter of the ebook. The solutions need to written out and handed in. BOPs are NOT truly optional since I grade on a curve. You will find which questions are due on our public webpage (www.chem.tamu.edu/class/fyp/wkk-chem.html) where my notes and old exams are. You will find the link to the ebook and the complete solution manual near the bottom of the left hand column of OWL. You are welcome to use the solution manual to help you, but if we see that you blatantly copied, you will get a 0 on the entire assignment. The BOPs will be divided into 4 sets as we cover the material in class. The first three sets will be due on the Thursday following each exam; the last set will be due on the final review day. You can turn them in late for 10% loss in points until the makeup for the exam is given. You must turn your original work, but you might keep a copy for your own use. You will be able to pick up your homework at a later date. Bonus points will be awarded and added to the "course average" according to the percentage of completed problems as shown below (although I'm a little more generous at the semester's end).

Percentage of problems completed correctly and turned in on time	<70%	70-89%	≥90%
Total number of bonus points to be added to your course average	0	1	2

On-Line Web Learning (OWL): You will be accessing the textbook, OWL problems and the BOP problems through OWL. Problems worth either 20 or 100 points (a whole exam grade) will be assigned from OWL – I will calculate your average both ways and give you the higher average. OWL is **NOT** optional. The due dates are the same as the BOPs to limit confusion. You only have to do the assigned ones, not the optional ones. If you are working on late OWL problems, you may have to access them through a tab at the top of the page marked "Past Due".

(1) Electronic Textbook (ebook or YouBook) and OWL homework are required for the course.

- You are buying the OWL code that is specifically for TAMU students. **THIS IS IMPORTANT!** See page 2 and 12 of the syllabus for info on buying and registering OWL for Aggies. You will need to log into the Cengage brain website as a returning or new student. If you have already used Cengage brain for another class, use that same login ID (your e-mail) and password. If you are new to Cengage brain, you will be prompted for information. Finally, you will be prompted for your credit card info. Be sure that the billing address matches that on your credit/debit card. Click to make the shipping address the same as the billing address. You will NOT be shipped anything, unless you are purchasing the optional paper-copy book.

Print your receipt, then go to 'my stuff'. You will see your purchase. Click on 'open' to get your access code. Your code should also be emailed to you, but it will take a while. Better yet, ask for a new browser window leaving your access code up in the old window. In the new window, immediately access OWL on the TAMU server and get registered right away by copying/pasting the code directly (see the next section)

Registering OWL: Access Owl at http://owl.chem.tamu.edu

At this point, you can choose which course (general, honors, liberal arts, engineering, or organic) for instructor/student login and registration. Next you choose between "User Login" or "Student Registration". You must first register your code.

- "Student Registration" You will click on your lecture section. Do this the first time you log on. You will be asked for information (name, uin, etc.) and for the login and password that you want for OWL. Finally, you will need the access code or pincode, which you can paste in. This will set up your OWL account.

  NOTE: If you are in Chem 102 and used OWL for Chem 101, try using the same login and password that you had last semester. The system will recognize that you are returning. You will be asked to confirm that you are same person and that your info is the same. This will extend your account, rather than having to set up a new one.

- "User Login" This is the spot you will bookmark and enter OWL after you are registered. You are now ready to use OWL. The first time you enter OWL, you will be given a screen that has your password blank. Just hit continue, if you want to leave your password the same. You will be in OWL and should see your course!

X. Calibrated Peer Review (CPR): Calibrated Peer Review (CPR™) is web-based software designed to promote writing and critical thinking in our classroom on topics important to chemistry. There will be 3 assignments and I will count the average of your best three scores out of 3 CPR assignments and 3 exam scores as your 4th exam score. CPR is optional. To help you guard yourself against plagiarizing someone's work, your essays must also be submitted to Turnitin.com to check for plagiarism by the writing due date or you won't get credit. If you see that you indeed plagiarized, you can resubmit as many times as you wish. Feel free to drop by and have me look over your essay before submission. The CPR handout is in the handout, on-line and in Copy Corner notes with information on Turnitin, accessed through our class on elearning.tamu.edu. Times might change. See next page.

Assignment 1: Plagiarism
Part A (Write): Mon. 9/1 6am --Thurs. 9/15 11:50pm
Part B (Calibrate & Critique): Thurs. 9/15 11:50pm – Tues.. 9/27 11:50pm

Assignment 2: Dynamic Equilibrium
Part A (Write): Mon. 10/10 6am - Tues. 10/25 11:50pm
Part B (Calibrate & Critique): Tues. 10/25 11:50pm - Tues. 11/1 11:50pm

Assignment 3: The Carbonic Acid/Bicarbonate Buffer System
Part A (Write): Tues. 11/1 6am - Thurs. 11/10 11:50pm
Part B (Calibrate & Critique): Thurs. 11/10 11:50pm - Wed. 11/23 11:50pm

XI. Lecture Attendance: I will not be taking attendance as such throughout the semester. However, to encourage you to attend class, there will be occasional in-class quizzes that will account for ~5% (30 pts) of your course grade. See Section XII.

XII. In-Class Team Quizzes: During the semester, I will give group clicker quizzes every period to be done in class by self-appointed teams, consisting of ~3-6 of your fellow students, sitting around you. The total quiz grade will be worth 40 points and I will count only your best 20 quizzes – each one is worth 2 points. The purpose of the exercise is to encourage you to (1) come to class and (2) think about the subject matter as we go through the course. Quiz 1 is the results of the two web personality quizzes found at the bottom of our public web page. Email me your results. Quiz 2 is the Information Card with personal information and a picture of you. Quiz 3 (worth 2 quizzes) is finishing the Molecule Game in my Second Life space.

XIII. Exams: There will be 3 exams (Exams 1, 2, and 3) given on the days indicated on the Calendar. Additionally, there will be a Final Exam and make-up exams. These exams will be a combination of multiple choice questions that will be machine graded and free response questions that will be hand graded.

(A) (A) Lecture Exams: These are 70 minute exams given during the regular lecture times. Each carries a value of 100 points with 80% multiple choice and 20% free response. I will only test on material I have covered in class or told you specifically you were responsible for. One or two review questions may also be included.

(B) Final Lecture Exam: The 2 hour Final Exam will be comprehensive, covering all the chapters taught during the semester. It is worth 160 pts with 140 pts multiple choice and 20 pts free response.

The scheduled time for the final exam is:
12/9 Friday **Section 501 FINAL EXAM:** 7:30-9:30am Room 100 HELD
You must bring your student I.D. to the Final Exam.

(C) Make-up Lecture Exams: There will be a make-up for each of the exams given during the semester if you miss any of them. The makeups are all free response exams and a little more difficult. If you took the regular exam, you cannot take the makeup exam unless there was a severe medical condition. The makeup exam is generally scheduled 10 days after each exam at 4:00 pm on Friday in Room 100 HELD. See the calendar for specific dates. I require a written statement about the excuse for the absence - it must be e-mailed to me or given to me during class time. My policy is fairly lenient - see "My Teaching Philosophy" on page 1. If the exam time conflicts with your other classes, please contact me immediately. The make-up exams will be at least as difficult as the regular exams.

XIV. Exam Administration: (WE PROVIDE THE SCANNING SHEETS)

(A) Check the exam seating assignment on the bulletin board outside Room 100 Held one day in advance. **Each exam has a different seating assignment.**

(B) If you are left-handed or have a special seating request and want to be assigned a left-handed or table seat, I have the sign-in sheet. Sign up as soon as possible in class.

(C) Arrive at the exam on time and wait outside until invited in. Cheating or bringing in material with intent to cheat will result in a zero for the exam or a more severe penalty, as determined by the Office of the Aggie Honor System (aggiehonor.tamu.edu)

(D) Bring to the exam at least two sharpened #2 pencils, an eraser, and your TAMU I.D. card. You will be provided with a scantron, periodic table and scratch paper. Pencil sharpeners and calculators (with certain restrictions) may also be brought. There must be **NO** "sharing" of calculators during an exam. Any other items must be "enclosed" out of sight in a briefcase, pack, purse, or sack, **and** placed in the front against the wall before taking the assigned seat.

(E) Students can not use calculators that are programmable or have alphanumeric capabilities for the exams. Some of the acceptable and unacceptable calculators are listed on the bulletin board outside Room 100 Heldenfels. **Any student attempting to use an unacceptable calculator will receive a zero for the exam plus we will turn your name into the Office of the Aggie Honor System.**

(F) Students may not have any electronic device, capable of communicating with anything or anybody at their seat during the exam. This includes telephones, pagers, computers, etc. If you must have such a device with you, you can put it in your backpack and place at the front of the room or you must turn it in at the front of the room; we will return it after the exam. We are not responsible if it is stolen – so don't bring it to the exam. **If we find such a device on your person, you will receive a zero for the exam plus your name will be turned into the Office of the Aggie Honor System.**

(G) Follow the directions on the front page of your exam. **Do not write on the back of the scanning sheet.** In addition, note that the answers have to be recorded on the standard color coded scanning sheet to be graded.

(H) During the exam, keep all work covered as much as possible. Talking or looking around the room will result in a withheld grade for the exam.

(I) Work carefully, but you must finish in the allotted time; exams handed in late will not be graded. Please remain seated quietly until asked to leave.

(J) You will be able to pick up the multiple choice part of your exam with an answer key after the exam outside my office in Rm 116 HELD.

You will also be able to access your grades through e-learning website. More details in Section XV. If your score is different from what you believe it should be, or if your score is not posted, please see me.

XV. World Wide Web:

Public website: www.chem.tamu.edu/class/fyp/wkk-chem.html. Included are my last year's exams, all my notes for Chem 101 and 102, a test-bank of selected multiple choice questions, a math review, videos and lots more.

TAMU website: elearning.tamu.edu. Included are link to check grades, links to my public website, clicker rebate info, Turnitin links to check plagiarism for CPR assignments. Go to http://elearning.tamu.edu/ , and click on TAMU (net id). Enter your netID and password to access your scores, Turnitin and other material..

XVI. Second Life (SL) on the TAMU Second Life Campus (itsinfo.tamu.edu/Services/TAMU_Second_Life_Campus.php)

In the summer of 2009, TAMU bought and developed two islands – Aggieland Island and 12th Man Island, which became the TAMU Second Life Campus – a public virtual extension of the main Texas A&M University campus in College Station, Texas. Now there are several islands. It is a unique educational environment in which students, instructors, and visitors can discover, connect, and learn. Many familiar campus landmarks have been faithfully replicated in Second Life, such as the Academic Plaza, the Memorial Student Center, and the Bonfire Memorial. In addition, several historic points of interest have been recreated—the Train Depot, the Water Tower—along with some new locations unique to virtual worlds, such as an "Aggie Beach" and teleport hubs. I see Second Life as a solution to a major issue:

- It allows people to meet and converse without having to physically get together on campus. In SL, you can chat, IM, and even talk with a microphone. If you use your computer's microphone, please use your ear buds so that your microphone doesn't pick up other people's conversations. Irritating echoes will occur if you don't. So, students can meet at the MSC and faculty can meet with students for class, office hours and review sessions.

Directions for getting into Second Life and creating your virtual personality, called an avatar, are on pages 9-11 and info movies will be on the elearning.tamu.edu page.

XVII. Grade Calculations

In calculating the lecture grades, each of the three exams counts as 100 points for a total of 300 points; the average of your best 3 scores out of 3 CPR assignments and 3 exams for a total of 100 point ("Ex4"); the OWL points will count for either 20 or 100 points; the clicker quizzes count for a total of 40 points, while the Final Exam counts as 160 points. All scores used for grade calculations are carried to 3 decimal places, but posted as rounded integers.

$$\text{Lecture Average} = \frac{\text{Total of 3 Exams + "Ex4" + OWL + In-Class Quizzes + Final Exam}}{\text{6.0 + OWL (either 0.2 or 1.0)}} + \text{BOPs}$$

The ranges of the letter grade will be determined at the end of the semester. In the past for a typical semester, the Chem 101 grades were determined using: A, $\geq$89; B, 78-88; C, 65-77; D, 50-64. **This semester's ranges could be different**.

Students missing a small portion of the course, but having at least a 50 average, will receive a grade of "I" (Incomplete) if they request this grade and meet the University criteria for this temporary grade.

XVIII. Review Schedule:

I am giving weekly review sessions on most Sunday afternoons at 4 pm in Room 100 HELD, covering lecture and a little lab material, including a section on writing with CPR and Turnitin. Check the calendar. We start this Saturday with Chapter 1 material on chemistry fundamentals, the math review and CPR.

XIX. Miscellaneous Notes

1. There will be TAs available in Room 116 HELD during the day (roughly 8:30am - 5 pm). See signs on the door and on the inside bulletin boards for hours. They will help with both lab and lecture questions.
2. Go to the First Year Chemistry Office (Rm 412 HELD) to have your scantrons regraded.
3. **Special announcements and schedule changes will be announced at the beginning of class.**

Tentative Calendar

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
8/28	8/29	8/30 **Introduction** **CHAPTER 14** Solutions	8/31	9/1 **No Class (out of town)** Start **CPR1** Plagiarism Start Writing (See Video/Handout on Elearning and at end of syllabus)	9/2 **Last day to add/ drop*
9/3 **SATURDAY** EXCEPTION (usually Sunday) Review Session Rm 100 Held 2pm	9/5	9/6 **CHAPTER 14** Solutions	9/7	9/8 **CHAPTER 14** Solutions	9/9
9/11 Weekly Review Session Rm 100 Held 2pm	9/12	9/13 **CHAPTER 19** Chemical Thermodynamics (Review Chapter 5)	9/14	9/15 **CHAPTER 19** Chemical Thermodynamics **CPR 1** Writing due Critiquing starts 11:50pm Remember Turnitin	9/16
9/18 Exam Review Session Rm 100 Held 2pm	9/19	9/20 ********** **EXAM 1** **********	9/21	9/22 **CHAPTER 19** Chemical Thermodynamics ****BOPs & OWL**** Set I DUE	9/23

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
9/25 Weekly Review Session Rm 100 Held 2pm	9/26	9/27 **CHAPTER 15** Chemical Kinetics **CPR 1** Critiquing due 11:50pm	9/28	9/29 **CHAPTER 15** Chemical Kinetics	9/30 Last Day for BOPs & OWL Set I ********** **MAKE-UP EXAM 1** 4 pm Rm 100 Held
10/2 Weekly Review Session Rm 100 Held 2pm	10/3	10/4 **CHAPTER 16** Chemical Equilibrium	10/5	10/6 **CHAPTER 16** Chemical Equilibrium	10/7
10/9 Weekly Review Session Rm 100 Held 2pm	10/10 **CPR 2** *Dynamic Equilibrium* Start Writing	10/11 **CHAPTER 16** Chemical Equilibrium	10/12	10/13 **CHAPTER 16** Chemical Equilibrium	10/14
10/16 Exam Review Session Rm 100 Held 2pm	10/17 **Midterm Grades due to Registrar*	10/18 ********** **EXAM 2** **********	10/19	10/20 **CHAPTER 16** Chemical Equilibrium ****BOPs & OWL**** Set II DUE	10/21

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
10/23 Weekly Review Session Rm 100 Held 2pm	10/24	10/25 **CHAPTER 17** Chemistry of Acids and Bases **CPR 2** Writing Due Critiquing Starts 11:50pm	10/26	10/27 **CHAPTER 17** Chemistry of Acids and Bases	10/28 Last Day for BOPs & OWL Set II ********** **MAKE-UP EXAM 2** 4 pm Rm 100 Held
10/30 Weekly Review Session Rm 100 Held 2pm	10/31	11/1 **CHAPTER 18** Other Aspects of Aqueous Equilibria **CPR 2** Critiquing Due 11:50pm **CPR 3** *The Carbonic Acid-Bicarbonate Buffer System* Start Writing	11/2	11/3 **CHAPTER 18** Other Aspects of Aqueous Equilibria	11/4 **Last day to Q-drop* **Last day to officially withdraw* **Last day to change KINE199 to S/U*
11/6 Weekly Review Session Rm 100 Held 2pm	11/7	11/98 **CHAPTER 18** Other Aspects of Aqueous Equilibria	11/9	11/10 **CHAPTER 18** Other Aspects of Aqueous Equilibria **CPR 3** Submit writing Critiquing starts By 11:50 pm	11/11 **CPR 3** Start critiquing
11/13 Exam Review Session Rm 100 Held 2pm	11/14	11/15 ********** **EXAM 3** **********	11/16	11/17 **CHAPTER 20** Electron Transfer Reactions (Electrochemistry) **** BOPs & OWL SET III DUE ******	11/18

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
11/20 Weekly Review Session Rm 100 Held 2pm	11/21	11/22 **CHAPTER 20** Electron Transfer Reactions (Electrochemistry)	11/23 **CPR 3** Submit critiquing By 11:50 pm	11/24 ***THANKSGIVING HOLIDAY***	11/25
11/27 No Review Session	11/28	11/29 **CHAPTER 20** Electron Transfer Reactions (Electrochemistry)	11/30	12/1 **CHAPTER 20** Electron Transfer Reactions (Electrochemistry)	12/2 Last Day for BOPs and OWL Set III ********** **MAKE-UP EXAM 3** 4 pm Rm 100 Held
12/4 Review Session Rm 100 Held 2pm	12/5 *Redefined Day* *Students Attend Friday Classess* *Dead Day*	12/6 **CHAPTER 23** Nuclear Chemistry *Redefined Day Students Attend Thursday Classes* *Dead Day*	12/7 ***READING DAY No Classes*** **FINAL REVIEW 10am-1pm Rm100 Held** **Last Day for BOPs and OWL Set IV**	12/8 ***READING DAY No Classes*** **Office Hours: 2pm - 5pm**	12/9

12/9 Friday **Section 501 FINAL EXAM:** 7:30-9:30am Room 100 HELD

12/12 Monday - **Last Day for BOPs&OWL Set IV** (10% off)

HOW TO GET AND USE YOUR *i>clicker2*

We are changing clicker companies in the First Year Chemistry Program since the E-Instruction clickers were not working well. If you have an E-Instruction clicker or an old i>clicker, you can get a $10 rebate – details and form on the website http://iclicker.com/Customers/education/TexasAMUniversityRebate/
You will need the form from the website, your receipt, the actual UPC bar code cut out from the i>clicker2 box, and the remote id numbers for your old clicker and the new **i>clicker2.**

Buy the **i>clicker2** at the MSC Bookstore or elsewhere - $46.65 (retail) – even on line at www.iclicker.com. The one-time price covers all class registration fees.

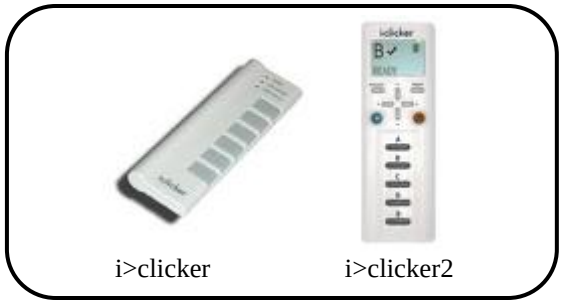
How to Enroll Your **i>clicker2** (easy):

1. Go to www.iclicker.com and click on "Register Your Clicker." You can do this now or wait until after class has begun.

No quiz data will be lost even if you don't get registered for a while.

2. Enter your First Name, Last Name, UIN and Remote ID found on the back of your clicker. Read further on the webpage if your registration is missing.

3. For our class either of the i>clicker versions will work since I will doing only multiple choice quizzes this semester. However, if you are buying a new clicker, get the **i>clicker2**. You can also share the i>clicker with a friend as long as you both are not in the same class. Just know that you will need the clicker every day.



4. For our class:

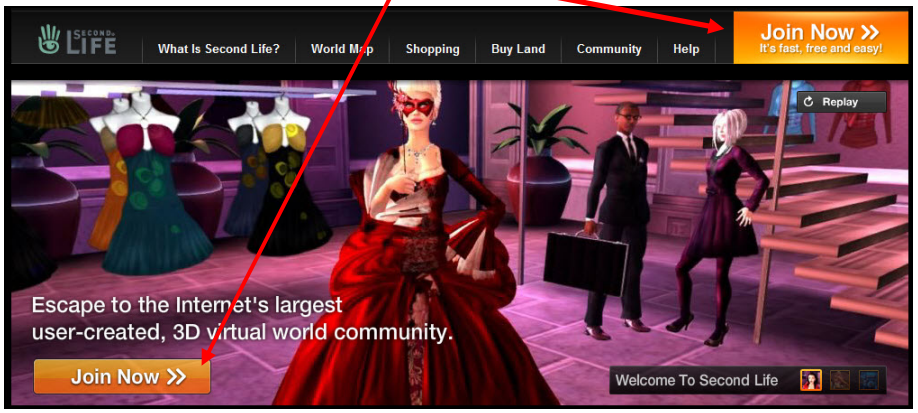
- We may be using a different frequency than the default for this class. The frequency we are using is [AA].
- At the beginning of each class:
  - Hold your On/Off button for 2 seconds until the current two-letter frequency code begins to flash.
  - Enter the new [frequency].
  - Your i>clicker2 remote will flash a ✓ that indicates you have successfully changed your frequency.
- Your frequency is now changed for the duration of the lecture & you may vote.
- Your i>clicker2 remote will stay on the frequency until you manually change it again.

5. To answer a multiple choice/true-false/yes-no question:

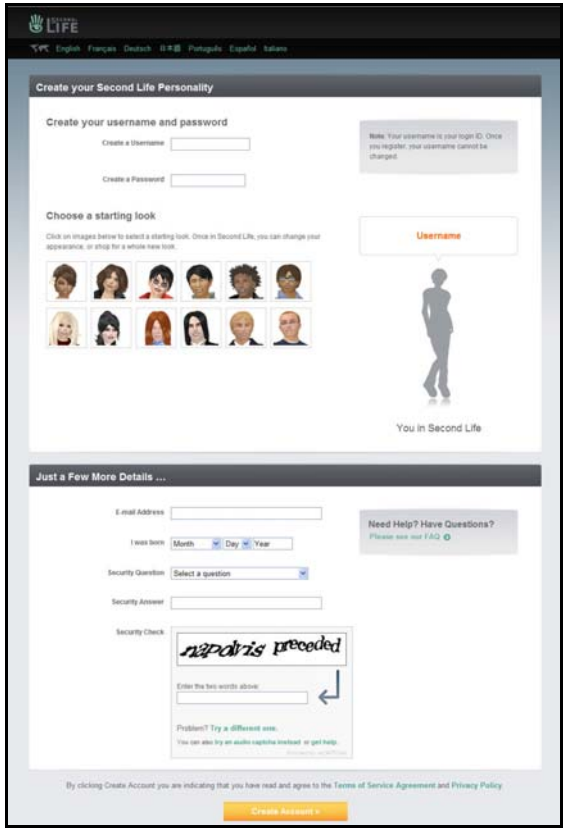
- simply press an A-E button on the Remote
- Your vote displays on the LCD screen
- Your vote is sent automatically; you don't need to press SEND.
- If the vote is received successfully, a checkmark appears.

Second Life

1. There are videos on elearning.tamu.edu to help you out. First go to SecondLife.com and click to join.



2. Fill out the form.

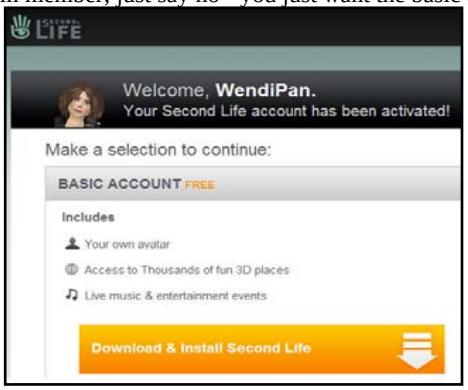


Now pick your User Name. Once you have done this, you cannot change your name. The system will check to be sure it is unique. However, you can always create another avatar later with a different name. Mine is Julia Tiraxibar. You can always change your avatar's look, hair, clothes, etc. later.

Your birthdate is required because Second Life is for folks 13 years and older.

Finish up with a security question and click on the yellow button to create your account.

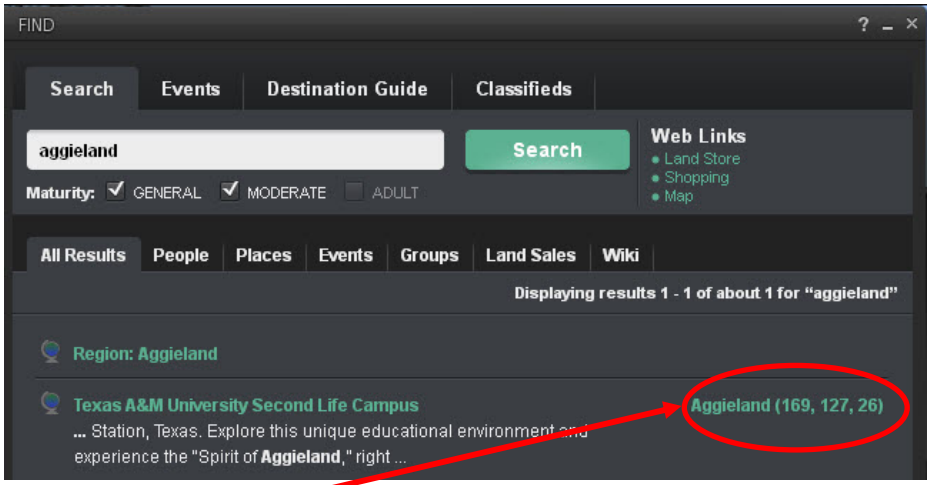
3. You'll get an email asking you to activate your account. You might get a message asking you to become a Premium member; just say no - you just want the basic account.



4. At this point, download and install the program. There is a MAC version available (go to secondlife.com). The SCC computers on campus and the ones outside my office have Second Life on them. Type in your avatar's username and password. If the computer has an older version of SL, type in your username and use "resident" in lower case letters as your last name. Click on the blue *Log In* button and you'll be taken to the Welcome Island to learn necessary skills for operating in Second Life.

   Use your arrow keys to turn around and walk.

5. When you're done learning about SL on Welcome Island, type Aggieland into the search box in the top right hand corner of your screen and click on the magnifying glass to search. You'll see the following box.:



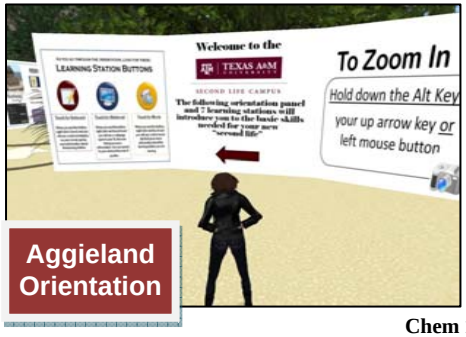
6. Click on the **Aggieland Island link**, then on the Teleport button. You'll be taken to the virtual Sul Ross statue on Aggieland Island. Look around and you'll see this Aggieland sign for travelling around Aggieland Island.

   You can also search for 12th Man and go directly to (7) the TELEPORT HUB.

7. Click on !>TELEPORT HUB to be taken to the boundary between 12th Man Island and Aggieland Island. You'll see a picture of my chemistry place. **Click** on my sign and you can transport directly to my area on the NEcorner of 12th Man Island.

8. On the **12th Man Transport sign**, you'll click on "Second Life Orientation" written especially for Aggies. This Aggie Orientation will teach you many additional necessary skills to be comfortable in the virtual world of Second Life.

   To the left of the entrance to Aggie Orientation, there is another sign to allow you to transport to my chemistry area.

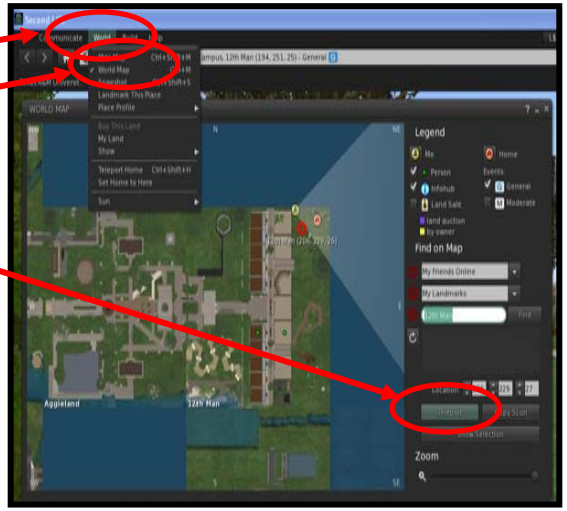


8. After the orientation, click on the sign found at the entrance to the Aggieland Orientation. to be transported to my area at the NE corner of 12th Man Island.

9. At this point, you will probably be in "basic" view. To have more options, quit the program and open up the program again. On the bottom bar under "mode" pick advanced. You'll have to quit and log back in.

10. Now you have the option of getting around the Aggie Second Life Islands in a different way. Click on **World** along the top bar and then the **World Map**. Your cursor becomes a cross on the map. Click on the spot where you want to go. Then hit **Teleport** and you will be instantaneously taken there.

    If it is nighttime in Second Life, you can always change that (I hate working in the dark). Go to **World** again and pick the last choice – Sun. You can set the time of day to your liking.



Don't forget that you can change your preferences – click on **Me** on the top bar and pick Preferences. Try to put Graphics on Moderate to get a better look around.

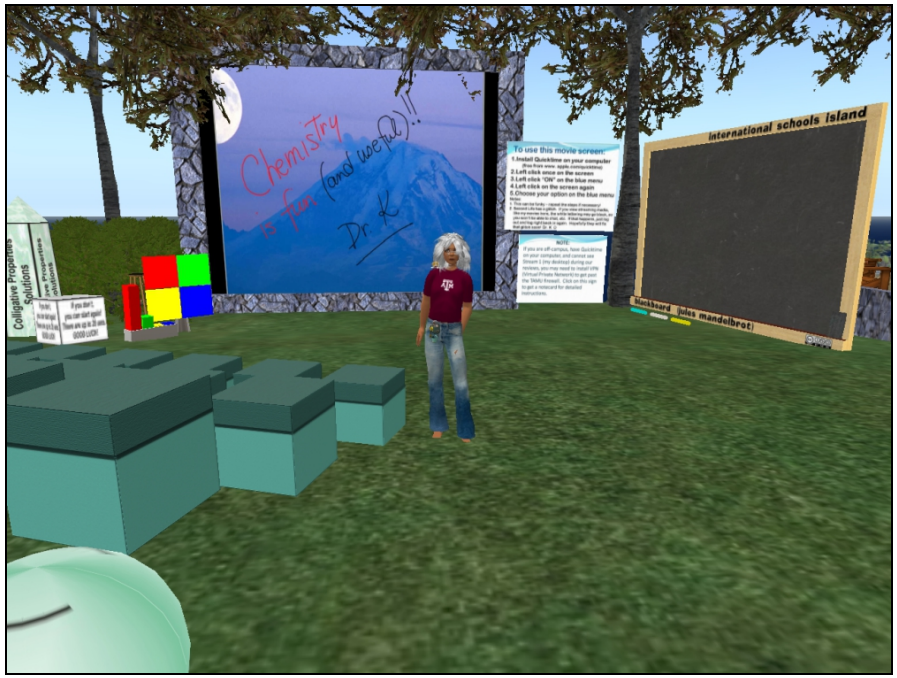
11. Come to my area and look around. We can meet here during office hours or by appointment. You can get double quiz credit if you finish the Molecule Game by the end of the semester. Unlike what the video says, you don't have to email me a picture of yourself playing the game.

12. Note: Just like the web, Second Life has places for mature audiences only. If you ever get into an uncomfortable place, type Aggieland into the search box like we did above to find your way back to dear old Aggieland.

See you in Second Life!

Dr. K (Julia Tiraxibar)

(more on the next page)



13. I will be in Second Life off and on in my area on the NE corner of 12th Man Island, TAMU SL campus. I can speak with you and help you with your assignments throughout the semester and work out problems on the movie screen. Here are the steps to see the screen:

    1. Install Quicktime on your computer - free from www.apple.com/quicktime
    2. Left click once on the screen
    3. Left click "ON" on the blue menu
    4. Left click on the screen again
    5. Choose your option on the blue menu
    6. This can be funky - repeat steps if necessary.

    To see me work problems, follow the directions above and pick WebStream, then Stream 1. You should see a blue Q, a green screen, then my desktop. If you don't see this, you are probably off-campus and you will need to have VPN (Virtual Private Network) so you can get past the TAMU firewall that protects our computers.

    First Way: Download and set up VPN according to TAMU:

    http://nis.tamu.edu/Home/Networking/Virtual_Private_Networks/Connecting_to_VPN.php . You'll be able to download the program and get the directions on how to set it up. If you have any troubles, call 979-845-8300 to get the help desk on campus. They are open 24/7 and are very helpful.

    Second Way: You can use Windows to set up a VPN. Here's how (I still have XP, but the directions should be similar.)

    1. Go to Start, then choose Control Panel, then Network Connections.
    2. Click on "Create a New Connection", then hit "Next"
    3. Choos "Connect to the Network at my Workplace"
    4. Choose "Virtual Private Network Connection"
    5. For Company Name - type TAMU or really anything...
    6. Chose "Do NOT dial the initial Connection"
    7. For Hose Name, type vpn-master.tamu.edu
    8. Add a shortcut to make it easier to connect
    9. Type in your UserName (net-id) and password for TAMU and check the box to allow only you to log in this way
    10. You should then get logged in by the TAMU system. You may have to log out of SL and log back in to see my desktop stream.

    There are also quizzes, my chapter summary videos (on the movie screen) and other activities on my SL classroom that you can use even when I'm not there.

    Join two groups as you enter my Chemistry Place: Dr.K's Chemistry Group and the TAMU Student Group. Simply click on each of the spinning balls and follow the directions.

Dear Student,

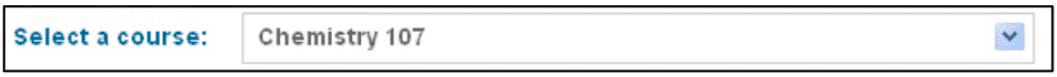
We'll be using OWL (Online Web Learning) as our online homework system this semester. You will need to have an access code and register for OWL in order to get homework credit. Here are your directions to get access.

BUYING ACCESS CODE

1. **First, get your OWL access code**. Codes come bundled with new textbooks purchased in the school bookstore. If you are NOT purchasing a text or are purchasing a used text, you can instead buy stand-alone codes in your school bookstore or online.

To purchase online go to http://www.cengagebrain.com/micro/tamuchem

Select your course from the **Select a course** menu:



Choose your product and click the **Add to Cart** button.

Complete the purchase.

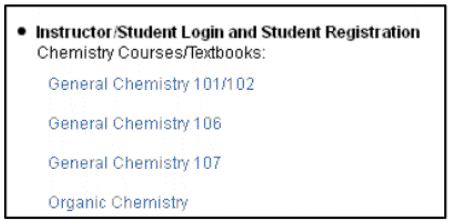
Your code will be emailed to you. If you don't receive your code you can retrieve it at www.cengagebrain.com

TRIAL ACCESS: You can register for OWL without an access code and instead use a 14-day free trial if you are having financial aid issues or other purchasing problems. See Step 5 below.

REGISTRATION

2. After you have your code, you can use it to register in OWL and then you can log in to your course.
   To register, open a web browser on your computer and go to http://owl.chem.tamu.edu/

3. Choose your course under the "Instructor/Student Login and Student Registration" area.



4. Choose the *Chemistry Department* by clicking on the blue arrow under **Student Registration.**

5. Choose the blue arrow next to the correct course and section you want to register for.
   Enter your information into the Self-Registration form. Type your access code into the Access Code space and press **Continue**. *Check the "Use 14-day free trial" box if you don't have your access code yet. You will need to enter a valid access code within 14 days to continue using OWL.

****Be sure to buy your valid code ONLY from http://www.cengagebrain.com/micro/tamuchem****

Once you reach the Student Registration: Successful Registration page, click on the Login Page link at the top. Bookmark this login page and use it whenever you visit OWL. Use the Login and Password you created during registering.

AFTER you register, get back to the login page anytime by going to http://owl.chem.tamu.edu/. Choose your course type and choose **Log in**. Choose the blue arrow under "User Login Page" to get to your login page. Bookmark this page.

Fall 2011

What is "Calibrated Peer Review" (CPR)™ and Why Are We Doing It?

Employers often identify communication skills as the most important characteristics of a prospective employee immediately following graduation from college. Your English and technical writing courses don't give you enough practice writing in a particular discipline. Learning to write well requires regular practice and feedback. Weekly writing assignments are rare because grading large numbers essays is very time consuming. Also, most writing classes don't give you enough practice in critiquing your own work and that of others.

In this chemistry class, we will be using a web-based program, called Calibrated Peer Review (CPR). Each CPR assignment can be worth 1/3 of an exam. I'll be taking the best 3 scores from your 3 exams and 3 writing assignments to give a 4th exam score. This is truly optional. You'll get regular practice and feedback, even in our large class; at the same time you will gain the critical evaluation skills that employers want.

Calibrated Peer Review (CPR©) is web-based software designed to increase the amount of writing done while teaching other subjects, including chemistry. The program accomplishes this by having you, as students, evaluate each other's writing. Since "peer review" is useful only if you take the job seriously, CPR "calibrates" you by having you first read essays of known quality. So the process is this:

(1) Time Period A: You will read and/or do the necessary background information on a chemistry-related topic, then write an essay about the topic following guidelines, and submit this on-line through the CPR program. Do not put your name on your paper. You must also submit it to turnitin.com (see page 5). Then wait until Time Period B begins. You can run it by me before you hand it in for pointers.

(2) Time Period B: You will then be "calibrated" so that we know you can with some expertise be able to recognize a poor essay, a reasonable essay and a good one. After calibration, you will be given 3 of your fellow students' essays to review. This is done anonymously. If you do well at the calibration, your reviews of other students' essays will be worth more. Assignment grades depend on the quality of your own essay, your reviews of other students, and the final critique of your own essay. So, you can write a mediocre essay, but still get points because you recognized that you could have done better. I realize that you and your peers are new at peer review, so if you feel your essay was graded unfairly, email me a request to regrade your essay.

Question 0: Where do I find my assignments? Look in the syllabus!

Question 1: This is my first CPR in the class, how do I access my assignment?

- Go to the CPR Login Page (http://cpr.tamu.edu/) and click on "Access CPR at TAMU."
- Enter your CPR username and password. You will not have to take the website tour again if you have already taken it. .If you forgot your CPR username, click on **Users: forgot your login information?** After selecting your institution and student ID (your UIN number), you will be prompted to answer your question. If you do so correctly, you will be asked to give a new password. If you failed to answer your own question, you can send an email to Dr. Wendy Keeney-Kennicutt at Kennicutt@mail.chem.tamu.edu. She will reset your CPR account.
- **If you are a new user, follow the New Users; First time login link.**
- Select your school from the list (we're the only school)
- Enter your UIN number - DO NOT USE DASHES. **If the server does NOT recognize your ID, first make sure you are on the correct website (cpr.tamu.edu). If you are on the correct site, contact Dr. Wendy Keeney-Kennicutt, the Administrator, by e-mail at kennicutt@mail.chem.tamu.edu. Please include your Section in the e-mail.**
- Complete your profile by creating a password and a challenge question. The server will give you your CPR username.. *Write these down somewhere you can find them. Please choose a challenge question that you CAN remember the answer for in the future.*

You will use this username and the password you created to access all your CPR assignments in ALL your courses at TAMU. If you are using CPR in more than one course, this username will allow you to access all of them. I**f your student ID is NOT recognized by the server, first make sure you are on the correct website (cpr.tamu.edu). If you still cannot get in, check with Dr. Wendy Keeney-Kennicutt, the CPR Administrator (kennicutt@mail.chem.tamu.edu) right away - include your section.**

Question 2: What do I do if I need help in writing my paragraph? (More Hints on page 3)

There are several things you can do. Have a friend read your paragraph or simply read it out loud yourself and see if it makes sense. Write it in a word processing program so you can check spelling and grammar. Ask your TA or instructor to give you some pointers to help guide you. Also there is a University Writing Center in Evans Library. UWC is located on the second floor of the Evans Library in Suite 1.214. Check the website for hours: http://writingcenter.tamu.edu. You can even work with consultants on line. Appointments are recommended, but the consultants will take walk-ins as time allows. For more information, see page 3, "How To Do Well On Your CPR Assignment."

Question 3: How do I format my TEXT entry?

You will want to use the minimum of HTML tags in your paragraph, because your work is easier to proof. HTML is very easy to do. One suggestion: write your text using a word processor, paste it into the CPR Text Entry box, then add the HTML tags, given at the bottom of the back of this handout. If you make a mistake in your HTML, your TEXT could be "invisible" to your reviewers and you will receive a lower score. Use the PREVIEW button often. If the PREVIEW button isn't working for you, try a different computer - it may be browser sensitive.

Always save your TEXT entry on your own computer. Be sure to check that you have received confirmation from the server that your text has been submitted. The CPR Administrator, Dr. Wendy Keeney-Kennicutt (kennicutt@mail.chem.tamu.edu) can verify this also. Check the timing for when you will start the reviewing process.

Question 4: The assignment is over, and what does it all mean?

When the assignment END time has passed, you can check your results. To help you understand your results, look at the page 4 of this handout.

Getting Started with CPR:

You will need to know your CPR Username and your password to access the CPR program.

To complete an account profile for a New User:

I. Go to the following URL: http://cpr.tamu.edu/ and click on "Access CPR at TAMU."
2. Select "New Users: first time logging in?"
3. Select **YOUR SCHOOL** from the pull down menu and enter your UIN. **DO NOT INCLUDE DASHES**. You may have to wait until the administrator gets your ID into the system. Check with your instructor. If there is still a problem, contact the administrator at kennicutt@mail.chem.tamu.edu - include your instructor's name and section.
4. Next, you will select a password. You will also need to enter a challenge question and answer. If you forget your login information, this challenge question will be asked of you to confirm your identity, so choose a question/answer that you will not forget and that others do not know.
5. Next, there is a field to enter your email address; this is optional.
6. Upon completion of your account profile, you will be given your unique **CPR username.** Make sure that you save your **CPR username.** You will need it every time you access CPR.

Before starting your first CPR assignment:

·After entering your *CPR* username and password, you will be directed to take a 10-minute tour of the website. If you get returned to the login page and cannot take the tour, email Dr. K (kennicutt@mail.chem.tamu.edu).

·Click on the "CPR Guided Tour" link and then the "Taking an Assignment" link- .Take the short PreTest for new users.
All information necessary to complete the PreTest can be found in the CPR Tour: "Taking an Assignment." You must take this tour prior to taking the PreTest. If you are a CPR veteran, you won't need to take the tour and PreTest.

Assignment Structure -Both stages are required to complete the assignment. There are two parts to a CPR assignment:

Part A: <begins with Assignment Start Time>
During this stage you will
a) explore source material about the assignment topic.
b) write about the topic. (**30 POINTS**) You can submit your paragraph as many times as you want until the due date. You must also submit it separately to Turnitin through the class's elearning website.
<ends with Text Entry End Time>

SUGGESTION: Write your text in MSWord or another program and do spelling and grammar check. This will serve as a backup should a problem occur during the submission process. If you miss the deadline due to technical problems, email me immediately with your paragraph and I can submit your paragraph for you.

Part B: <begins with Text Entry End Time>
During this stage you will evaluate
a) three example texts written specifically for this assignment (**30 POINTS**). These evaluations are called " calibrations." You only have only **two** opportunities to do each calibration, then you must go on.
b) three texts written by your classmates (**30 POINTS**). This stage is called "reviews." **BE KIND BUT FAIR** in your comments to your classmates.
c) your own text. This stage is called the "self-assessment." (**10 POINTS**)
<Ends with Assignment End Time >

After the assignment ends:

You can now check your assignment results. For clarification, go see "How to Interpret Your Results" on page 4 of this handout. **If you don't agree with your classmates' assessment of your work, please email or visit Dr. Wendy Keeney-Kennicutt (kennicutt@mail.chem.tamu.edu, Rm 116 HELD) and she will reassess your work. Her decision is final**.

Important Points:

·CPR is on a secure TAMU server so the official time is Central time on the server. You can check the CPR time by clicking on the "CPR Time" link on the top of the assignment screens.

·**Always save your text entry on the local computer, a separate computer, and/or a flash drive before submitting 'it to CPR.**

·Most Internet Service Providers (ISP's, like Bruin On-Line, Earth link, and MSN) terminate Internet connections that have not been used for more than 10 -20 minutes. If a connection is terminated and you try to submit work, it will be **LOST**.

·CPR does **NOT** work with the AOL browser. Make your internet connection with AOL, then switch to the Internet Explorer (4.x or 5.x) or the Netscape (4.7x) browsers.

HTML Tags for formatting your text: They do not count as words IF DONE CORRECTLY. Always check with Preview button.

<B> text </B> Displays the enclosed text in boldface; <B>Hi</B> gives **Hi.**
<1> text </I> Displays the enclosed text in italics; <I>Hi</I> gives *Hi.*
_{text} Displays the enclosed text subscripted; H₂O gives H_2O.
^{text} Displays the enclosed text superscripted; Na⁺¹ gives Na^{+1}
<CENTER> text </CENTER> Centers the text on the line

 Inserts a line break after the text.
<P> or </P> Inserts a blank line after the text. Always preview your text. If the preview button isn't working, try a different computer.
For a forward arrow (→) in an equation, type --> (dash,dash,ampersand,g,t,semicolon) and a double headed arrow (<-->) can be <--> (ampersand,l,t,semicolon,dash,dash,ampersand,g,t,semicolon).

These are the only tags you will need in this class.

How to Do Well on Your CPR Assignment

Number 1 - Be aware of the deadlines and don't miss them. It is very important to your score. If you miss the deadline for Part 1, you cannot continue and you will miss 70% of your score! The times are given as Central Time.

Number 2 - For questions, check the Frequently Asked Questions (FAQs) at the Login page.

(Note: The grading criteria vary from course to course. The scoring presented here is what we are using in the First Year Chemistry Program at TAMU)

There are 4 parts to a CPR Assignment (You are given about 1 week to complete Part A (1) and about 1 week to complete Part B (2,3,4) - see your schedule.)

Part A Part 1 (30 pts) - Writing your paragraph
Part B Part 2 (30 pts) - Calibrating your skills as a reviewer
Part 3 (30 pts) - Reviewer your peers
Part 4 (10 pts) - Reviewing your own paragraph

Part 1: Writing your paragraph (30 pts).

- DON'T WAIT UNTIL THE LAST HOUR - you may experience technical problems and then it may be too late to fix them.
- If you have any technical problems, contact Dr. Wendy Keeney-Kennicutt (Rm 116 HELD) at kennicutt@mail.chem.tamu.edu.
- Remember to submit your essay twice – once to CPR and once to Turnitin on our class page at elearning.tamu.edu (directions on page 5).
- Read the information and go to the links - DO THE RESEARCH BEFORE WRITING.
- Your writing should be similar in level to a chemistry textbook written for AP or college chemistry, unless otherwise specified.
- You can resubmit your paragraph as many times as you wish up until the deadline.
- Write in a word-processing program - then paste it into the block. If you take too long writing your paragraph directly on the website, you will be timed out and have problems submitting your text. **KEEP A COPY**, so that if there is a problem, you can resubmit.
- Include ALL the answers to the Guiding Questions in your paragraph, but be sure that your paragraph reads smoothly.
- Make sure you have an introductory sentence.
- Make your sentences "tighter" to get within the word limits. Scientists do not use unnecessary words. It is a real skill to be able to write a summary or abstract. Pick your words carefully. Instead of long sentences with lots of prepositional phrases, use adjectives.
  For example: The reaction occurring between acids and bases involves the formation of a salt and sometimes water is also formed.
  Rewritten: Acid-base reactions form salt and sometimes water.
- Always check your paragraph using spell and grammar check. The process is not always perfect since most spellcheckers are not set up to read scientific explanations but it helps. Make sure you use complete sentences and that the subject agrees with the verb - plural subjects require the plural form of the verb. Also, if a word is used incorrectly but is spelled correctly, spell check won't find it, but it is still considered to be a misspelling.
  For example: The main principal used in equilibria is LeChatelier's Principle.
  Problem: "Principal" is the person in charge of a school; the word required here is "principle."
- Have a friend read your paragraph or simply read it out loud yourself and see if it makes sense.
- Ask your TA or instructor to give you some pointers to help guide you.
- Visit the University Writing Center in Evans Library (http://writingcenter.tamu.edu/). UWC is located on the second floor of the Evans Library in Room 1.214 and on West Campus. For more information visit the website. They are aware of CPR and how it is handled.
- Use a minimum of html tags in your paragraph - it makes it easier to read. See other sheet for listing of appropriate html tags.
- BEWARE: If you do NOT submit your paragraph on time, you CANNOT do the rest of the assignment and you lose 70 out of 100 points! If you do miss the deadline - contact ASAP Dr. K at kennicutt@mail.chem.tamu.edu. Sometimes, but not always, we can submit your paragraph for you.
- Your grade will depend on your peer's evaluation of your work, but if you think your peers were in error, please contact Dr. Wendy Keeney-Kennicutt at kennicutt@mail.chem.tamu.edu.

Part 2: Calibrating Your Skills As a Reviewer (30 pts - 10 pts per calibration).

- There will be 3 calibrations. You will be given a good paragraph, a fair paragraph and a poor paragraph on the topic (not necessarily in that order). To pass a calibration, you must (a) get most of the style questions correct (65%), (b) get most of the content questions correct (65%), and (c) your overall score of the paragraph must be within ±2.5 of the rating given by the composer of the assignment. To pass the calibration, you must do well on (a), (b) and (c). You will have 2 chances for each calibration. If you do a good job on your second try, you will still get 10 out of 10 points.
- Be a fair reviewer. Don't think you are doing a favor by grading easy - you will only hurt yourself.
- **Content is more important than grammar, spelling and style**. It is a good rule of thumb to deduct a maximum of 2 - 3 only on the overall score for bad style, which includes bad grammar, spelling errors, absence of an introductory sentence, etc. An easy way to grade objectively is to calculate the % correct and divide by 10.
- To check for spelling errors and grammar problems, copy the paragraph into a word-processing program and do a grammar/spell check. The program will catch most of the problems. You can also visit the University Writing Center or ask me.

Part 3: Reviewing Your Peers (30 pts - 10 pts per review).

- You will be reviewing 3 of your peers, just like you did the calibrations. In this class, for you to get the full 10 points per review, the score you give your peer's paragraph (out of 10 pts), must be within ±2.5 of the weighted average rating given by all the reviewers. The scorings made by reviewers who did well on their calibrations will be weighted heavier; the scorings made by reviewers who did poorly on their calibrations will not be given much weight at all. If your rating lies outside ±2.5 of the average, you will get a 0.
- Be a fair reviewer. Don't think you are doing a favor by grading easy - you will only hurt yourself. On the other hand, don't give someone a terrible grade undeservedly because somehow you think that will help you or the class curve. That person will likely complain about your review to Dr. Keeney-Kennicutt, have the scoring changed and you will lose all your reviewing points.
- Content is more important than grammar and style. It is a good rule of thumb to deduct a maximum of 2 - 3 pts for bad style (use the rubric), which includes bad grammar, spelling errors, absence of an introductory sentence, etc. An easy way to grade objectively is to calculate the % correct and divide by 10.
- To check for spelling errors and grammar problems, copy the paragraph into a word-processing program and do a grammar/spell check. The program will catch most of the problems. You can also visit the University Writing Center.

Part 4: Reviewing Your Own Paragraph (10 pts).

- To get a full 10 points, your self-assessment must be ±1.5 of the weighted average given by your peers. To get 5 points, you must be ±2.5 of your peers' assessment. So, for example, if you wrote a poor paragraph, judged to be a 3.5 by your peers, if you gave yourself a 5.0, you are ±1.5 of the judgment of your peers and you get 10 points. If you gave yourself a 6.0, you are ±2.5 of the peers' assessment and you get 5 points. However if you give yourself a 7.0, you get 0 points for your self-assessment.
- Be a fair reviewer of yourself. Many times a person will give themselves a 10, even if they have obvious spelling mistakes. To check for spelling errors and grammar problems, copy the paragraph into a word-processing program and do a grammar/spell check. The program will catch most of the problems. You can also visit the University Writing Center. Of course, you should have done this before your paragraph was submitted! An easy way to grade objectively is to calculate the % correct and divide by 10.
- Your grade will depend on your peer's evaluation of your work, but if you think your peers were in error, please contact Dr. Wendy Keeney-Kennicutt at kennicutt@mail.chem.tamu.edu. More on the scoring on "Understanding Your Results Page."

How to Interpret Your Results - It's Easier Than It Looks

When the assignment is finally over and you log into your CPR page for the assignment, you will see:

Click on "Assign Info" to get information about this assignment.

Click here and see CPR Time - Central Time

Here are the results of the reviews that you did of other students.

Here is the limit of how far you can be away from the average and still have mastered the reviews and received full credit for your reviews of others.

If you mastered a review, you received 10 points - if not, you got 0

Here are the scoring parameters for the self-assessment: ±1.5 for full 10 points and ±2.5 for 5 points.

HOME | CPR Time | LOG OFF — Calibrated Peer Review™

Assign Info
CPR Stages
Source Material
Calibration Results
Reviews
Self-Assessment
Results

Click here to see the source material for the assignment again.

The small arrow means you are looking at the "Results" page.

Reviews You Performed

Answer Key	Max. Allowable Dev. = 2.5	
Reviews	Rating Deviation	Overall Grade
Review 1	1.00	Mastered
Review 2	0.12	Mastered
Review 3	1.21	Mastered

Click here to see the reviews you did of your peers' work.

Reviews Performed of Your Work

Answer Key				Max. Allowable Deviation = 1.5 / 2.5
Questions	Answers			
	Review 1	Review 2	Review 3	Self-Assessment
1. Does the essay have a descriptive topic sentence? (Does the first sentence of the essay accurately introduce the subject of the entire essay?)	No	Yes		
2. Do ...	No	Yes		
3. Is ...				
4. Is ... best ... Thym				
5. Do ... expe ... sam ... need				
6. Is ... the t ... unkn				
7. Is ... solu ... cove				
8. Do ... the i ... used				
9. Ar ... direc				
10. Are there any spelling errors in the essay?	No	No	No	No
11. Are there significant grammatical errors in the essay? (For example, run-on sentences or sentence fragments, missing articles, or subject-verb disagreements)	No	Yes	No	No
12. How would you rate this text?	5	7	9	7
Weight Applied to Ratings	0.83	0.83	0.83	
Weighted Average Text Rating	7.00			

Click here to see a copy of the paragraph you submitted.

This number tells how far away your rating was from the weighted average of the review scores as set by all the reviewers of that paragraph.

Click here to view your calibration results (if you did a recalibration, only the 2nd one is shown). It will look like this. Anything that is underlined is clickable. So, you can revisit the calibration paragraphs, see your answers and the author's answers and click on why the author's made their decisions. Near the top you see "65% Style" and "65% Content" - meaning you must get at least 65% of the style and content questions correct to master the calibration. "Max.Dev. = 2.5" means your rating of the paragraph must be within ±2.5 of the rating given the paragraph by the assignment's author. To master the calibration, you must pass all 3 parts of it. For more details, see the back page, under Part 2.

Calibration Scores

Answer Key	65% Style	65% Content	Max. Dev. = 2.5	
Calibrations	Min. % Correct Style Questions	Min. % Correct Content Questions	Rating Deviation	Overall Grade
Calibration 1	100%	87.5%	0	Mastered
Calibration 2	100%	75%	0	Mastered
Calibration 3	100%	100%	0	Mastered

Calibration Results

Questions	Answers					
	Calibration 1		Calibration 2		Calibration 3	
	Inst.	You	Inst.	You	Inst.	You
1. Does the essay have a descriptive topic sentence? (Does the first sentence of the essay accurately introduce the subject of the entire essay?)	No	No	No	No	Yes	Yes

Click here to see your peers' explanations of why they gave you the score they did.

This weight factor depends on how well the reviewer did on the calibrations. A person who did terribly on the calibrations has an RCI of 1 (ranges from 1 to 6), a weight of 0 and doesn't affect your self-assessment score.

Scores and Overall Grade

Stage	Performance	Score
Text Entry	Avg. Weighted Text Rating = **7.00**	**21.00** out of 30
Calibrations	Avg. Calibration Deviation = **0.00**	**30.00** out of 30
Reviews	Avg. Review Deviation = **0.78**	**30.00** out of 30
Self-Assessment	Self-Assessment Deviation = **0.00**	**10.00** out of 10
Overall Score		**91.00** out of 100

If the Self-Assessment Deviation is 1.5 or less, you get 10 pts, if 2.5 or less, you get 5 pts, if greater than 2.5, 0 pts.

Your paragraph's score is 3x the rating given it by your peers.

Your total score for the assignment - it can be worth 1/3 of an exam.

If any scores appear in red at the bottom after a week or so, then Dr. Keeney-Kennicutt or some other qualified instructor has looked at a paragraph (either yours or your peers) and reassessed it. This may or may not change your final score. If you have any questions, or want your scores reassessed, contact her at kennicutt@mail.chem.tamu.edu.

How to Use Turnitin in our Class

UNTIL YOU SUBMIT TO TURNITIN, YOU WILL HAVE A 0 FOR YOUR CPR ASSIGNMENT.

I know that many of you are unfamiliar with what constitutes plagiarism, commonly defined as the act of passing off someone else's work as your own. You will learn more about plagiarism at TAMU as you work on your first Calibrated Peer Review assignment.

This semester, we will be using Turnitin, as a monitor so that you can check your writing for plagiarism in your CPR assignments.

Access Turnitin using our class page on elearning.tamu.edu

To submit a paper, log in to elearning.tamu.edu and click on the assignment. Just follow the directions. You can upload your text by cut and paste or by file upload.

Cut and Paste: This is very straightforward. **DO NOT** add HTML tags; it is not necessary and will only confuse you when you look at the report.

Uploading the file: Type your essay title into the text box and click "Browse," and the "Choose File" box will open so that you can locate the correct file on your computer. Click on the file you want; its name will appear in the text box, then click "Open." The file name and address will appear in the Browse box, and then hit "Submit." After submission, you will see the message: "Your paper has been submitted. Below is a digital receipt for your submission. A copy of this receipt will also be emailed to you. If you would like, print the receipt below for your records."

You can resubmit your assignment as many times as you wish. The first time you submit, you should be able to immediately look at your "Originality Report." After submission, click on "Class Portfolio." There is a small colored box to the right of the submission date. The color denotes how original your paper is. If it is gray, either the program hasn't finished checking or you have submitted more than once. When you click on the box after your first submission, you'll see your "Originality Report." Any part of your text in red can be considered by me to be plagiarized IF it hasn't been properly cited. The program cannot tell if you have cited correctly. Even if you put the phrase in quotes, it will still turn up red. Don't worry - if that's the case, we will be able to tell. You can click on "Side-By-Side Version" near the top right hand corner to see your paper and the one to which it was compared.

Your essays for CPR must be submitted to Turnitin on elearning.tamu.edu by the assignment deadlines or you will get a zero for the assignment, even if your work is original. I will be checking everyone's work for each assignment to be sure (1) it was submitted in the time limits and (2) it passed the guidelines for plagiarism.

How to use Turnitin on elearning.tamu.edu for Calibrated Peer Review (CPR):

All CPR assignments are due at 11:50pm (Central Time). So the deadline for submitting your essay to Turnitin will be the same time. However, if you forget, just turn in your essay as soon as you remember. Note that your submission is stamped with the date. The server time for Turnitin is Central Time. Hopefully, you will check yourself for plagiarism before that time, so you can rewrite if necessary. If I discover that you plagiarized the assignment or did not submit your essay to Turnitin.com on time, you will receive a 0 for that entire assignment. I will give you back your grade on a person-by-person basis once you submit it to Turnitin.

Common Writing Errors

(Thanks to Dr. Pat Lynch)

Run-on Sentence:

Incorrect: *The strategy proved to be effective with all students, it was a favorite of many teachers.*

Correct: The strategy proved to be effective with all students**;** it was a favorite of many teachers. (You need to use a semicolon rather than a comma.)

Inappropriate use of Apostrophe:

Incorrect: ***It's*** *use is common.* "It's" is the contraction for "It is"; the apostrophe does NOT denote the possessive case in this instance.

Correct: **Its** use is common.

It's = it is
Its = the possessive form of it
Hints: **DO NOT** use apostrophes for plural nouns (she gave it to her parents'). **DO** use apostrophes to indicate possession: (my mother's book - our mothers' books, except with "its").

Agreement with pronouns:

Incorrect: *If the student loses* ***their*** *books . . .* This is incorrect, because the noun is singular (student) and your pronoun is plural (their).

Correct: If the student loses his or her books . . .

They're, there, their: **Correct:** They're going home. Their book is here. There is the house.

Parallel structure in lists: When writing a sequence, all items in the sequence should be the same format.

Incorrect: *The following are critical: planning instruction, use good teaching, and make evaluations.*

Correct: The following are critical: planning instruction, teaching effectively, and evaluating results.

Vague Pronouns: *This method has been used effectively;* ***they*** *have found it useful with all grades.* Who are "**they**?"

Do not use a colon after a verb or preposition.

"Proven" – avoid using this word in summarizing research. It is very rare that a single study will "prove" something. It may "indicate" or "suggest" but not prove. Similarly, "the study showed." The authors may have "found" certain results in this instance, but that does not show that something is a truth. It is best to avoid absolute statements altogether. This includes the following: all, none, never, always.

Check out These Resources!

1. Common Errors in English (http://www.wsu.edu/~brians/errors/errors.txt)
2. Common Errors in Student Writing (http://www.westminster.edu/staff/brennie/writerro.htm)
3. Common Writing Errors (http://www.arc.sbc.edu/writingerrors.html)
4. Common Writing Errors (http://www.ucalgary.ca/UofC/eduweb/grammar/marking/alpha.htm)
5. Notes on Common Writing Errors (http://www.dartmouth.edu/~sullivan/CommonWritingErrors.html)
6. Writing Rules to Make You Smile: (http://www.ruf.rice.edu/~bioslabs/tools/report/wrules.html)

Periodic Table of Elements

	IA (1)	IIA (2)	IIIB (3)	IVB (4)	VB (5)	VIB (6)	VIIB (7)	VIIIB (8)	VIIIB (9)	VIIIB (10)	IB (11)	IIB (12)	IIIA (13)	IVA (14)	VA (15)	VIA (16)	VIIA (17)	0 (18)
1	2.1 | 1 H 1.008																2.1 | 1 H 1.008	2 He 4.003
2	1.0 | 3 Li 6.941	1.5 | 4 Be 9.012											2.0 | 5 B 10.81	2.5 | 6 C 12.01	3.0 | 7 N 14.01	3.5 | 8 O 16.00	4.0 | 9 F 19.00	10 Ne 20.18
3	1.0 | 11 Na 22.99	1.2 | 12 Mg 24.31											1.5 | 13 Al 26.98	1.8 | 14 Si 28.09	2.1 | 15 P 30.97	2.5 | 16 S 32.07	3.0 | 17 Cl 35.45	18 Ar 39.95
4	0.9 | 19 K 39.10	1.0 | 20 Ca 40.08	1.3 | 21 Sc 44.96	1.4 | 22 Ti 47.88	1.5 | 23 V 50.94	1.6 | 24 Cr 52.00	1.6 | 25 Mn 54.94	1.7 | 26 Fe 55.85	1.7 | 27 Co 58.93	1.8 | 28 Ni 58.69	1.8 | 29 Cu 63.55	1.6 | 30 Zn 65.39	1.7 | 31 Ga 69.72	1.9 | 32 Ge 72.61	2.1 | 33 As 74.92	2.4 | 34 Se 78.96	2.8 | 35 Br 79.90	36 Kr 83.80
5	0.9 | 37 Rb 85.47	1.0 | 38 Sr 87.62	1.2 | 39 Y 88.91	1.3 | 40 Zr 91.22	1.5 | 41 Nb 92.91	1.6 | 42 Mo 95.94	1.7 | 43 Tc (98)	1.8 | 44 Ru 101.07	1.8 | 45 Rh 102.91	1.8 | 46 Pd 106.42	1.6 | 47 Ag 107.87	1.6 | 48 Cd 112.41	1.6 | 49 In 114.82	1.8 | 50 Sn 118.71	1.9 | 51 Sb 121.75	2.1 | 52 Te 127.60	2.5 | 53 I 126.90	54 Xe 131.29
6	0.8 | 55 Cs 132.91	1.0 | 56 Ba 137.33	1.1 | 57 La 138.91	*	1.3 | 72 Hf 178.49	1.4 | 73 Ta 180.95	1.5 | 74 W 183.85	1.7 | 75 Re 186.21	1.9 | 76 Os 190.2	1.9 | 77 Ir 192.22	1.8 | 78 Pt 195.08	1.9 | 79 Au 196.97	1.7 | 80 Hg 200.59	1.6 | 81 Tl 204.38	1.7 | 82 Pb 207.2	1.8 | 83 Bi 208.98	1.9 | 84 Po (209)	2.1 | 85 At (210)	86 Rn (222)
7	0.8 | 87 Fr (223)	1.0 | 88 Ra (226)	1.1 | 89 Ac (227)	**	104 Rf (261.11)	105 Db (268)	106 Sg (271)	107 Bh (270)	108 Hs (269)	109 Mt (278)	110 Ds (281)	111 Rg (281)	112 Cn (285)	113 Uut (286)	114 Uuq (289)	115 Uup (289)	116 Uuh (293)	117 Uus (294)	118 Uuo (294)

Pauling Electronegativity →

* Lanthanide Series	1.1 | 58 Ce 140.12	1.1 | 59 Pr 140.91	1.1 | 60 Nd 144.24	1.1 | 61 Pm (145)	1.1 | 62 Sm 150.36	1.1 | 63 Eu 151.97	1.1 | 64 Gd 157.25	1.1 | 65 Tb 158.93	1.1 | 66 Dy 162.50	1.1 | 67 Ho 164.93	1.1 | 68 Er 167.26	1.1 | 69 Tm 168.93	1.0 | 70 Yb 173.04	1.2 | 71 Lu 174.97
** Actinide Series	1.2 | 90 Th 232.04	1.3 | 91 Pa 231.04	1.5 | 92 U 238.03	1.3 | 93 Np (237)	1.3 | 94 Pu (244)	1.3 | 95 Am (243)	1.3 | 96 Cm (247)	1.3 | 97 Bk (247)	1.3 | 98 Cf (251)	1.3 | 99 Es (252)	1.3 | 100 Fm (257)	1.3 | 101 Md (258)	1.3 | 102 No (259)	1.5 | 103 Lr (260)

SOLUBILITY PRODUCTS (25°C)

Substance	K_{sp}
Aluminum compounds	
$Al(OH)_3$	1.9×10^{-33}
$AlPO_4$	1.3×10^{-20}
Barium compounds	
$BaCO_3$	8.1×10^{-9}
$BaCrO_4$	2.0×10^{-10}
BaF_2	1.7×10^{-6}
$Ba_3(PO_4)_2$	1.3×10^{-29}
$BaSO_3$	8.0×10^{-7}
$BaSO_4$	1.1×10^{-10}
Cadmium compounds	
$CdCO_3$	2.5×10^{-14}
$Cd(OH)_2$	1.2×10^{-14}
CdS	3.6×10^{-29}
Calcium compounds	
$CaCO_3$	4.8×10^{-9}
$CaCrO_4$	7.1×10^{-4}
CaF_2	3.9×10^{-11}
$Ca(OH)_2$	7.9×10^{-6}
$CaHPO_4$	2.7×10^{-7}
$Ca(H_2PO_4)_2$	1.0×10^{-3}
$Ca_3(PO_4)_2$	1.0×10^{-25}
$CaSO_4$	2.4×10^{-5}
Chromium compounds	
$Cr(OH)_3$	6.7×10^{-31}
$CrPO_4$	2.4×10^{-23}
Cobalt compounds	
$CoCO_3$	8.0×10^{-13}
$Co(OH)_2$	2.5×10^{-16}
$CoS(\alpha)$	5.9×10^{-21}
$CoS(\beta)$	8.7×10^{-23}
$Co(OH)_3$	4.0×10^{-45}
Co_2S_3	2.6×10^{-124}
Copper compounds	
CuI	5.1×10^{-12}
Cu_2S	1.6×10^{-48}
$CuCO_3$	2.5×10^{-10}
$Cu(OH)_2$	1.6×10^{-19}
CuS	8.7×10^{-36}
Gold compounds	
$Au(OH)_3$	1.0×10^{-53}
AuI_3	1.0×10^{-46}
Iron compounds	
$FeCO_3$	3.5×10^{-11}
$Fe(OH)_2$	7.9×10^{-15}
FeS	4.9×10^{-18}
$Fe(OH)_3$	6.3×10^{-38}
Fe_2S_3	1.4×10^{-88}
Lead compounds	
$PbBr_2$	6.3×10^{-6}
$PbCO_3$	1.5×10^{-13}
$PbCl_2$	1.7×10^{-5}
$PbCrO_4$	1.8×10^{-14}
PbI_2	8.7×10^{-9}
$Pb_3(PO_4)_2$	3.0×10^{-44}
$PbSeO_4$	1.5×10^{-7}
$PbSO_4$	1.8×10^{-8}
PbS	8.4×10^{-28}

Substance	K_{sp}
Magnesium compounds	
$MgCO_3$	4.0×10^{-5}
MgF_2	6.4×10^{-9}
$Mg(OH)_2$	1.5×10^{-11}
Manganese compounds	
$Mn(OH)_2$	4.6×10^{-14}
MnS	5.1×10^{-15}
$Mn(OH)_3$	$\sim 1 \times 10^{-36}$
Mercury compounds	
Hg_2Br_2	1.3×10^{-22}
Hg_2CO_3	8.9×10^{-17}
Hg_2Cl_2	1.1×10^{-18}
Hg_2CrO_4	5.0×10^{-9}
Hg_2I_2	4.5×10^{-29}
Hg_2SO_4	6.8×10^{-7}
Hg_2S	5.8×10^{-44}
$Hg(OH)_2$	2.5×10^{-26}
HgI_2	4.0×10^{-29}
HgS	3.0×10^{-53}
Nickel compounds	
$NiCO_3$	6.6×10^{-9}
$NiS(\alpha)$	3.0×10^{-21}
$NiS(\beta)$	1.0×10^{-26}
$NiS(\gamma)$	2.0×10^{-28}
Silver compounds	
Ag_3AsO_4	1.1×10^{-20}
$AgBr$	3.3×10^{-13}
Ag_2CO_3	8.1×10^{-12}
$AgCl$	1.8×10^{-10}
Ag_2CrO_4	9.0×10^{-12}
AgI	1.5×10^{-16}
Ag_3PO_4	1.3×10^{-20}
Ag_2SO_3	1.5×10^{-14}
Ag_2SO_4	1.7×10^{-5}
Ag_2S	1.0×10^{-49}
Strontium compounds	
$SrCO_3$	9.4×10^{-10}
$SrCrO_4$	3.6×10^{-5}
$Sr(OH)_2$	3.2×10^{-4}
$Sr_3(PO_4)_2$	1.0×10^{-31}
$SrSO_3$	4.0×10^{-8}
$SrSO_4$	2.8×10^{-7}
Tin compounds	
$Sn(OH)_2$	2.0×10^{-26}
SnI_2	1.0×10^{-4}
SnS	1.0×10^{-28}
$Sn(OH)_4$	1.0×10^{-57}
SnS_2	1.0×10^{-70}
Zinc Compounds	
$ZnCO_3$	1.5×10^{-11}
ZnS	1.1×10^{-21}

PHYSICAL CONSTANTS/CONVERSION FACTORS

Speed of light = 3.00×10^8 m/s
Planck's const. = 6.63×10^{-34} J·s
Avogadro's Number = 6.02×10^{23}
Electron charge = 1.602×10^{-19} C
Faraday's const. = 96,485 C/mole e^-
Molar gas constant (R) = 0.0821 L·atm/mol·K
= 62.4 L·torr/mol·K
= 8.314 J/mol·K
= 1.987 cal/mol·K

0°C = 273 K
1.00 atm = 760 torr
1 inch = 2.54 cm (exact)
1.00 lb = 454 g
1 Å = 1.0×10^{-10} m
1.00 cal = 4.184 J
Mass of e^- (m_e) = 0.00055 amu
Mass of p (m_p) = 1.0073 amu
Mass of n (m_n) = 1.0087 amu

SPECIFIC HEATS OF COMMON SUBSTANCES

Substance	Specific Heat (J/g·°C)	Substance	Specific Heat (J/g·°C)
H_2O (s)	2.09	Hg (ℓ)	0.138
H_2O (ℓ)	4.18	C_6H_6 (ℓ)	1.74
H_2O (g)	2.03	C_6H_6 (g)	1.04

HEATS OF TRANSFORMATION AND TRANSFORMATION TEMPERATURES

Substance	MP (°C)	Heat of Fusion (J/g)	BP (°C)	Heat of Vap. (J/g)
H_2O	0.00	334	100	2260
Hg	– 39	11	357	292
C_6H_6	5.48	127	80.1	395

MOLAL FREEZING POINT AND BOILING POINT CONSTANTS

Solvent	FP (°C)	K_f (°C/*m*)	BP(°C)	K_b(°C/*m*)
H_2O	0	1.86	100	0.512
C_6H_6	5.48	5.12	80.1	2.53
Camphor	178.40	40	207.42	5.61

SELECTED IONIZATION CONSTANTS

(aqueous solutions at 25°C)

Acid	K_a	Acid	K_a
Acetic	1.8×10^{-5}	Propanoic	1.3×10^{-5}
Benzoic	6.3×10^{-5}	Sulfuric	K_1 = very large
Carbonic	$K_1 = 4.2 \times 10^{-7}$		$K_2 = 1.2 \times 10^{-2}$
	$K_2 = 4.8 \times 10^{-11}$		
Formic	1.8×10^{-4}		
Hydrocyanic	4.0×10^{-10}		
Hydrofluoric	7.2×10^{-4}	**Base**	K_b
Hypobromous	2.5×10^{-9}	Ammonia	1.8×10^{-5}
Hypochlorous	3.5×10^{-8}	Aniline	4.2×10^{-10}
Nitrous	4.5×10^{-4}	Dimethylamine	7.4×10^{-4}
Phenol	1.3×10^{-10}	Hydroxylamine	6.6×10^{-9}
Phosphoric	$K_1 = 7.5 \times 10^{-3}$	Methylamine	5.0×10^{-4}
	$K_2 = 6.2 \times 10^{-8}$	Pyridine	1.5×10^{-9}
	$K_3 = 3.6 \times 10^{-13}$	Trimethylamine	7.4×10^{-5}

SELECTED STANDARD REDUCTION POTENTIALS (25°C)

Acidic Solution	Standard Reduction Potential, E° (volts)
$Li^+(aq) + e^- \rightarrow Li(s)$	− 3.045
$K^+(aq) + e^- \rightarrow K(s)$	− 2.925
$Rb^+(aq) + e^- \rightarrow Rb(s)$	− 2.925
$Ba^{2+}(aq) + 2e^- \rightarrow Ba(s)$	− 2.90
$Sr^{2+}(aq) + 2e^- \rightarrow Sr(s)$	− 2.89
$Ca^{2+}(aq) + 2e^- \rightarrow Ca(s)$	− 2.87
$Na^+(aq) + e^- \rightarrow Na(s)$	− 2.714
$Mg^{2+}(aq) + 2e^- \rightarrow Mg(s)$	− 2.37
$H_2(g) + 2e^- \rightarrow 2H^-(aq)$	− 2.25
$Al^{3+}(aq) + 3e^- \rightarrow Al(s)$	− 1.66
$V^{2+}(aq) + 2e^- \rightarrow V(s)$	− 1.18
$Mn^{2+}(aq) + 2e^- \rightarrow Mn(s)$	− 1.18
$Cr^{2+}(aq) + 2e^- \rightarrow Cr(s)$	− 0.91
$Zn^{2+}(aq) + 2e^- \rightarrow Zn(s)$	− 0.763
$Cr^{3+}(aq) + 3e^- \rightarrow Cr(s)$	− 0.74
$Ga^{3+}(aq) + 3e^- \rightarrow Ga(s)$	− 0.53
$Fe^{2+}(aq) + 2e^- \rightarrow Fe(s)$	− 0.44
$Cr^{3+}(aq) + e^- \rightarrow Cr^{2+}(aq)$	− 0.41
$Cd^{2+}(aq) + 2e^- \rightarrow Cd(s)$	− 0.403
$PbSO_4(s) + 2e^- \rightarrow Pb(s) + SO_4^{2-}(aq)$	− 0.356
$Tl^+(aq) + e^- \rightarrow Tl(s)$	− 0.34
$Co^{2+}(aq) + 2e^- \rightarrow Co(s)$	− 0.28
$Ni^{2+}(aq) + 2e^- \rightarrow Ni(s)$	− 0.25
$Sn^{2+}(aq) + 2e^- \rightarrow Sn(s)$	− 0.14
$Pb^{2+}(aq) + 2e^- \rightarrow Pb(s)$	− 0.126
$2H^+(aq) + 2e^- \rightarrow H_2(g)$ (reference electrode)	0.00
$Sn^{4+}(aq) + 2e^- \rightarrow Sn^{2+}(aq)$	0.15
$Cu^{2+}(aq) + e^- \rightarrow Cu^+(aq)$	0.153
$SO_4^{2-}(aq) + 4H^+(aq) + 2e^- \rightarrow H_2SO_3(aq) + H_2O$	0.17
$SO_4^{2-}(aq) + 4H^+(aq) + 2e^- \rightarrow SO_2(g) + 2H_2O$	0.20
$Cu^{2+}(aq) + 2e^- \rightarrow Cu(s)$	0.337
$Cu^+(aq) + e^- \rightarrow Cu(s)$	0.521
$I_2(s) + 2e^- \rightarrow 2I^-(aq)$	0.535
$O_2(g) + 2H^+(aq) + 2e^- \rightarrow H_2O_2(aq)$	0.682
$Fe^{3+}(aq) + e^- \rightarrow Fe^{2+}(aq)$	0.771
$Hg_2^{2+}(aq) + 2e^- \rightarrow 2Hg(\ell)$	0.789
$Ag^+(aq) + e^- \rightarrow Ag(s)$	0.7994
$Hg^{2+}(aq) + 2e^- \rightarrow Hg(\ell)$	0.855
$Pd^{2+}(aq) + 2e^- \rightarrow Pd(s)$	0.987
$Br_2(\ell) + 2e^- \rightarrow 2Br^-(aq)$	1.08
$Pt^{2+}(aq) + 2e^- \rightarrow Pt(s)$	1.23
$O_2(g) + 4H^+(aq) + 4e^- \rightarrow 2H_2O$	1.229
$MnO_2(s) + 4H^+(aq) + 2e^- \rightarrow Mn^{2+}(aq) + 2H_2O$	1.23
$Cr_2O_7^{2-}(aq) + 14H^+(aq) + 6e^- \rightarrow 2Cr^{3+}(aq) + 7H_2O$	1.33
$Cl_2(g) + 2e^- \rightarrow 2Cl^-(aq)$	1.36
$Au^{3+}(aq) + 3e^- \rightarrow Au(s)$	1.50
$MnO_4^-(aq) + 8H^+(aq) + 5e^- \rightarrow Mn^{2+}(aq) + 4H_2O$	1.51
$Au^+(aq) + e^- \rightarrow Au(s)$	1.68
$H_2O_2(aq) + 2H^+(aq) + 2e^- \rightarrow 2H_2O$	1.77
$Co^{3+}(aq) + e^- \rightarrow Co^{2+}(aq)$	1.82
$F_2(g) + 2e^- \rightarrow 2F^-(aq)$	2.87
Basic Solution	
$2H_2O + 2e^- \rightarrow H_2(g) + 2OH^-(aq)$	− 0.828
$MnO_4^-(aq) + 2H_2O + 3e^- \rightarrow MnO_2(s) + 4OH^-(aq)$	0.588

Examples of Inorganic Nomenclature and Charges of Ions:

CATIONS		**ANIONS**	
Formula	**Name**	**Formula**	**Name**
Li^+	lithium ion	N^{3-}	nitride ion
Na^+	sodium ion	P^{3-}	phosphide ion
K^+	potassium ion	O^{2-}	oxide ion
Rb^+	rubidium ion	S^{2-}	sulfide ion
Cs^+	cesium ion	Se^{2-}	selenide ion
Mg^{2+}	magnesium ion	F^-	fluoride ion
Ca^{2+}	calcium ion	Cl^-	chloride ion
Sr^{2+}	strontium ion	Br^-	bromide ion
Ba^{2+}	barium ion	I^-	iodide ion
Cr^{2+}	chromium(II) ion	CN^-	cyanide ion
Cr^{3+}	chromium(III) ion	OH^-	hydroxide ion
Mn^{2+}	manganese(II) ion	CO_3^{2-}	carbonate ion
Fe^{2+}	iron(II) ion	HCO_3^-	hydrogen carbonate ion (bicarbonate ion)
Fe^{3+}	iron(III) ion	NO_3^-	nitrate ion
Co^{2+}	cobalt(II) ion	NO_2^-	nitrite ion
Co^{3+}	cobalt(III) ion	PO_4^{3-}	phosphate ion
Ni^{2+}	nickel(II) ion	HPO_4^{2-}	hydrogen phosphate ion
Cu^+	copper(I) ion	$H_2PO_4^-$	dihydrogen phosphate ion
Cu^{2+}	copper(II) ion	PO_3^{3-}	phosphite ion
Sn^{2+}	tin(II) ion	AsO_4^{3-}	arsenate ion
Sn^{4+}	tin(IV) ion	SO_4^{2-}	sulfate ion
Zn^{2+}	zinc ion*	HSO_4^-	hydrogen sulfate ion
Al^{3+}	aluminum ion*	SO_3^{2-}	sulfite ion
Ag^+	silver ion*	ClO_4^-	perchlorate ion
Cd^{2+}	cadmium ion*	ClO_3^-	chlorate ion
NH_4^+	ammonium ion	ClO_2^-	chlorite ion
$**CH_3NH_3^+$	methylammonium ion**	ClO^-	hypochlorite ion
$**(CH_3)_2NH_2^+$	dimethylammonium ion**	BrO_4^-	perbromate ion
$**(CH_3)_3NH^+$	trimethylammonium ion**	BrO_3^-	bromate ion
		BrO_2^-	bromite ion
		BrO^-	hypobromite ion
		IO_4^-	periodate ion
		IO_3^-	iodate ion
		IO_2^-	iodite ion
		IO^-	hypoiodite ion
		CH_3COO^-	acetate ion
		$CHOO^-$	formate ion
		MnO_4^-	permanganate ion
		CrO_4^{2-}	chromate ion
		$Cr_2O_7^{2-}$	dichromate ion

* no Roman numerals a necessary since the ion only exists in one oxidation state

** for Chem 102

Required Weak Acids and Weak Base Nomenclature for Chem 102:

(See notes for required acids and bases for Chem 101)

WEAK ACIDS		**WEAK BASES**	
Formula	**Name**	**Formula**	**Name**
CH_3COOH	acetic acid	NH_3	ammonia
CHOOH	formic acid	CH_3NH_2	methylamine
HCN(aq)	hydrocyanic acid	$(CH_3)_2NH$	dimethylamine
HF(aq)	hydrofluoric acid	$(CH_3)_3N$	trimethylamine
HClO	hypochlorous acid		
HBrO	hypobromous acid		
HNO_2	nitrous acid		

For interest: