Chem 115 - Section 1
Fall, 2006
Study Guide for Exam I

The first hour exam will be given in our usual location (Lipke Auditorium), during regular class time on Friday, October 13th. You will have the full hour to complete the test, but you will need to work efficiently to complete it. When you come to the test, please take alternate seating; i.e., there should be a vacant seat to the left and right of you, if possible. Bring lead pencils and erasers (*no pens or colored pencils*) and your calculator. Be sure your calculator is working and that you have spare batteries, if needed. You may bring a spare calculator, if you wish. In addition to the test packet, you will be given a separate copy of the periodic table, which you can use in conjunction with any question. Use the back of it for scrap paper. The test will consist of five pages, including the cover page (four pages of questions). **You will be required to write your UMass Boston student number on the cover of the test.** Your answers will be written on the test pages, not a separate answer sheet. *Be sure to write all numeric answers to the proper number of significant figures.* You may begin working as soon as you receive the test, although it may be a few minutes before you receive the periodic table.

Arrive on time. If you come late to the test you will not be given extra time, except in extraordinary circumstances. *If you arrive after the first test has been turned in, you will not be allowed to take the test.* I would urge you to leave home early to allow for commuting problems.

Do not even think about cheating! No notes, books, or your own scrap paper should be available to you during the test. There will be multiple versions of the test, which differ in subtle ways that will make cheating obvious. Your test will probably not be identical to others around you. If it is evident that you have cheated, expect a zero for the test. Further action may be taken, as well, which could result in your expulsion from the University. As indicated in the initial information for the course, anyone bringing any device capable of communicating with any other device (e.g., activated cell phone, pager, communicating calculator) will receive a zero for the test. Furthermore, no sharing of calculators is allowed.

The test will cover lecture material corresponding to the assigned sections of Chapters 1 - 3 in the text and Assignments 1 - 4. The format of the test is very similar to the Sample Test, posted separately on the web site. The test will consist of the following parts.

1. (10 points; 2 points each) Who did what? Match the person with the concept or discovery.

   You will be given the following list of twelve names from which you will fill in the blanks to match five concepts or discoveries. Know what each of the following contributed to the material covered in the course so far. Some individuals are notable for more than one accomplishment.

Becquerel	Chadwick	Dalton	Davy
Lavoisier	Mendeleev	Millikan	Moseley
Nagaoka	Proust	Thomson	Rutherford

2. (8 points; 4 points each)

Two brief calculations dealing with concepts such as moles of compound; numbers of molecules, atoms, or ions; and percent composition. Be sure your answers are given to the proper number of significant figures. You *do not* need to show work leading to your answers for this part.

3. (12 points; 6 points each) In the spaces provided, balance the following skeletal equations, using lowest whole number coefficients.

Complete and balance two skeletal equations, using lowest whole-number coefficients.

4. (36 points; 6 points each part) Fill in the blanks with the correct answers.

These questions deal with various topics from Chapters 1 through 3, covering fundamental concepts, nomenclature, empirical and molecular formulas, nuclide composition and notation, terms related to the periodic table, predicting formulas of ionic compounds, relationships between molecular formulas and empirical formulas, and significant figures. Each of the six parts has two to six blanks to be filled in, so the points for each answer vary accordingly, giving a total of 6 points for each lettered part.

5. (16 points) Answer both parts.

A two-part question involving calculations dealing with empirical and molecular formulas either from percent composition, combustion analysis, or another form of analysis based on stoichiometric relationships. You must show mathematical set-ups that lead to the answers you give. Answers without mathematical justification receive no credit. On the other hand, partial credit is given for correct parts of a mathematical set-up when the final answer is not correct. Simple mathematical errors lose 1 point, as do final answers quoted to the wrong number of significant figures. (Do not worry about being rigorous about the number of significant figures for an intermediate result that is simply calculated on the way to the final answer.)

6. (18 points + 5 point bonus) Consider the following reaction:

Calculations dealing with stoichiometric relationships in a chemical equation and the concept of the limiting reagent. As with the preceding problem, you must show mathematical set-ups that lead to the answers you give. In particular, you must show calculations that lead to the identification of the limiting reagent. If you guess at which is the limiting reagent, even if you guess correctly, you will lose 4 points if you do not show an explicit determination of the limiting reagent.

BONUS (5 points)

A follow-up question to the limiting reagent problem in question 6. Your answer to question 6 must be essentially correct to receive credit for this bonus question. Do not attempt this question unless you have completed all other parts of the test.

All questions on this test are similar in style and level of difficulty to problems you have seen in class and have been assigned for homework. Good luck!