Chem 370 - Spring, 2019
Assignment 10

The last lecture in this course will be Wednesday, May 8th. On Friday, May 10th, we will review the assignment below and answer any questions about Test 3, which will be given on Monday, May 13th, in two parts, in our regular morning meeting and in our afternoon meeting. I will give back the tests on Wednesday, May 15th, the last day of classes.

Test 3

Test 3 will cover the material we discussed in lectures concerning transition metal electronic spectra (Chapter 11), transition metal complex reaction mechanisms (covered portions of Chapter 12), and all the descriptive chemistry we covered for hydrogen and groups 1 through 18 (assuming we make it that far). Questions on material in Chapter 11 and 12 will be similar to those shown in the posted third test from last year and those assigned for homework (cf. Assignment 9). The descriptive chemistry, which will be the bulk of the second half of the test, will ask you to complete and balance a certain number of equations, representing the typical chemistry of the main group elements, and to draw structures for some of the compounds we discussed. These questions will be very similar to those in Assignment 9 and this assignment. I usually give a larger number of reaction questions (e.g., 25) than you need to answer (e.g., 15). In other words, you will not be in trouble if you cannot remember some particular reaction. There will also be a few essay questions about overall behaviors and their causes, which we will have discussed in class. Again, I will give you more questions than you need to answer, so you will be able to pick those questions on which you feel most confident. Look at the descriptive parts of the posted test 3, Part 2, on the website to get a feel for the kinds of questions you can expect. I will give further details once I have written the test.
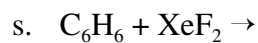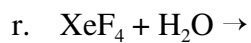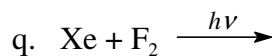
Final Exam

As you know, the final exam in this course, which covers all the material presented in lectures, is optional. It is offered only for those students who at the end of the semester have amassed insufficient points from tests and quizzes to receive an acceptable grade, based on 300 points. To decide whether or not to take the final exam, add up all your points after the third test, plus all your points from the bonus quizzes, and divide by 300. Using the break-points given in the document "General Information and Syllabus", decide if the grade you would receive is acceptable to you. In general, only students who would not otherwise receive a passing grade should take the final exam. If you decide to take the final, your grade will be based on the total of three tests, the bonus quizzes, and the final exam, divided by 500. Please understand that there is some risk involved in electing to take the final – it could hurt your grade, rather than help it. The final exam will be given on Friday, May 24th, 8:00-11:00 am, in room Y04-4120. **If you decide to take the final exam, you must let me know by Monday, May 20th, so that I will know how many copies to prepare.**

Homework Assignment

We will review the following assignment during our regular class time on Friday, May 10th.

1. From the book, do problems 8.20 (8.19), 8.22 (8.21), 8.25 (8.24), 8.31 (8.28), 8.34 (8.31), 8.36 (8.33), 8.42 (8.38), 8.43 (8.39), 8.45 (8.41). (Numbers in parentheses refer to the 4th edition.)

2. Complete and balance the following equations:

a. $Ca_3P_2 + H_2O \rightarrow$

b. $CH_2(CO_2H)_2 + P_4O_{10} \rightarrow$

c. $PbS + O_2 \xrightarrow{\Delta}$

d. $Al_4C_3 + H_2O \rightarrow$

e. $CaC_2 + H_2O \rightarrow$

f. $GeCl_4 + Ge \rightarrow$

g. $Ca_3(PO_4)_2 \cdot 2H_2O + SiO_2 + C \xrightarrow{\Delta}$

h. $NH_4NO_3 \xrightarrow{\Delta}$

i. $NaNO_3 \xrightarrow{\Delta}$

j. $PH_3 + I_2 + H_2O \rightarrow$

k. $BaO_2 + H_2SO_4 \rightarrow$

l. $SO_3 + H_2O \rightarrow$

m. $SO_3^{2-}(aq) + S(s) \rightarrow$

n. $CaF_2 + H_2SO_4 \xrightarrow{\Delta}$

o. $Cl_2 + OH^- \rightarrow$

p. $NH_4ClO_4 + Al \rightarrow$

q. $Xe + F_2 \xrightarrow{h\nu}$

r. $XeF_4 + H_2O \rightarrow$

s. $C_6H_6 + XeF_2 \rightarrow$

3. Write balanced equations for the following name reactions or processes:

a. Preparation of pure silicon

b. Haber process

c. Raschig synthesis

d. Ostwald process

e. Contact process for making sulfuric acid

f. Synthesis of fluorine

g. Industrial synthesis of hydrochloric acid

4. Draw sketches of the following molecules and indicate the point groups.

a. Carbon suboxide

b. P_4O_{10}

c. N_5^+ ion

d. Orthophosphoric acid

e. Xenon trioxide