

**Chemistry 500**

**Spring 2000**

**Dr. Hunter**

**Old Exams for Spring 1998**

## Chemistry 500, First Quiz

Spring 1998

Dr. Hunter

Your Name: \_\_\_\_\_,  
                    last                    first

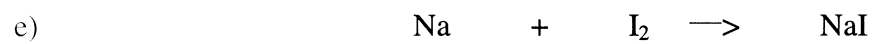
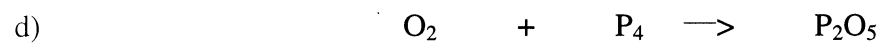
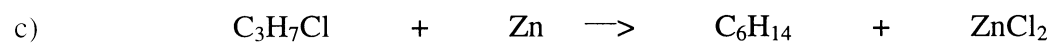
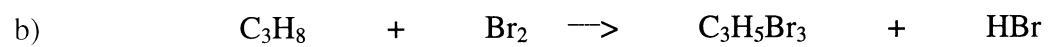
Student Number: \_\_\_\_\_

For all of the questions on the following three pages, make sure you clearly explain your reasoning and show your work. You may use a calculator (you may *not* program information into your calculator) but may not use any other outside materials such as books or notes. If you are unsure of how to interpret any of the questions, please ask me for help. On some of the following questions, you have a choice of which parts to answer. *Circle the letters of the parts you want me to mark.* When you are done, please hand your exam in to me at the front and then either wait quietly in your desk or in the hallway. This quiz is scheduled for 20 minutes at which time class will resume.

Total Grade:           /40 (i.e. 10% of the final grade)



2. (25 marks in total) Balance each of the following reactions. Show your work!!!!



## Chemistry 500, Second Quiz

Spring 1998

Dr. Hunter

Your Name: \_\_\_\_\_ , \_\_\_\_\_  
                    last                    first

Student Number: \_\_\_\_\_

For all of the questions on the following two pages, make sure you clearly explain your reasoning and show your work. You may use a calculator (you may *not* program information into your calculator) but may not use any other outside materials such as books or notes. If you are unsure of how to interpret any of the questions, please ask me for help. On some of the following questions, you have a *choice* of which parts to answer. ***Circle the letters of the parts you want me to mark.*** When you are done, please hand your exam in to me at the front and then either wait quietly in your desk or in the hallway. This quiz is scheduled for 30 minutes at which time class will resume. **Show all of your work!!!!!!!!!!!!!!**

Total Grade:           /40 (i.e. 10% of the final grade)

1. (15 marks in total) For *three out of four* of the following questions, give a short answer in the space provided. Show your reasoning and/or your work.

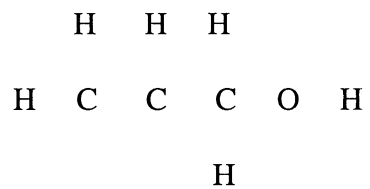
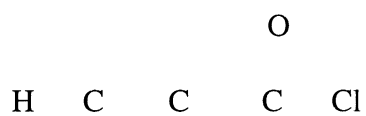
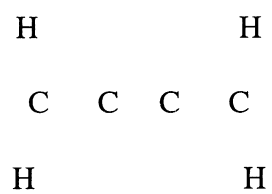
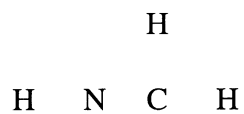
a. Describe the relationship between Ultra-Violet light and O<sub>2</sub>.

b. Clearly explain what the frequency and amplitude of a wave are.

c. Give an example of a specific halon and explain how halons relate to the ozone hole.

d. Clearly describe the structure of the atom using <sup>32</sup>S as an example.

2. (25 marks in total) For the following molecules give the Lewis electron structure in the space provided. Show your reasoning, any assumptions you make, and/or your work.







1. (20 marks in total) For *two out of three* of the following questions, give a short answer in the space provided. Show your reasoning and/or your work.

a. Clearly describe what is meant by the term “clathrate” and how it relates to global warming.

b. Draw the Lewis structures of *five* structural isomers of  $C_6H_6O$ .

c. Clearly describe what is meant in Chemistry by the term “mole”.

2. (20 marks in total) For *four out of six* of the following compounds, draw their Lewis structures, name their key functional group, and describe a use for the compound. [Be sure you draw in each atom and give it the correct number of bonds.]

a. Acetone

b. Diethyl Ether

c. Acetic Acid

d. Ethyl Acetate

e. Benzene

f. Acetylene.



1. (20 marks in total) For *two out of three* of the following questions, give a short answer in the space provided. Show your reasoning and/or your work.

a. Clearly describe the difference between a H-bomb and an A-bomb.

b. Draw the Lewis structures of three polymers and give their names.

c. Clearly describe how crude oil is processed to give the maximum yield of gasoline.

2. (20 marks in total) Below, clearly describe, using text and diagrams, the design of a nuclear power reactor. Include in your discussion how this system generates electricity.



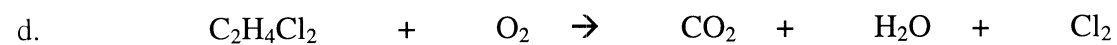
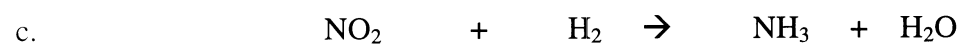
1. (30 marks in total) For *two out of three* of the following, answer the questions. Use the back of this page if necessary.

a. Which are the major sources of ozone at ground level and in the ozone layer? Where do you want ozone and why?

b. What are halons and what are their uses and environmental effects?

c. For the molecule  $\text{C}_2\text{H}_4\text{O}$ , calculate the percent composition for all of the elements, calculate its molecular weight, and draw three structural isomers.

2. (10 marks in total) Balance *all* of the following reactions. Show your reasoning and/or your work.





3. (20 marks in total) For *four out of five* of the following questions, give a short answer in the space provided. Show your reasoning and/or your work.

a. Define the term isotope and give the three important isotopes of hydrogen.

b. Explain why sticking your hand in a hot oven for 5 seconds will not burn it but touching the oven rack in the same oven for even a fraction of a second will produce a burn.

c. Giving your detailed reasoning, predict the effect on global warming of an increase in the amount of rice grown.

d. Give a description of how X-ray diffraction works.

e. What causes the rank of coal to change over time and how does this affect its chemical composition.

4. (20 marks in total) For *four out of six* of the following compounds, draw their Lewis structures, name their key functional group, and describe a use for the compound. [Be sure you draw in each atom and give it the correct number of bonds.]

a. Acetone

b. Diethyl Ether

c. Acetic Acid

d. Ethyl Acetate

e. Benzene

f. Acetylene.

5. (20 marks) For the following molecules give the Lewis electron structure in the space provided. Predict the bond distances and angles around each atoms. Show your reasoning, any assumptions you make, and/or your work.

