

Chemistry 1500, Dr. Hunter

Summer 2004

Quiz # 4 (Individual Part)

Name: _____,
 Last name **First name**

Student Number (your social security number): _____

Signature: _____

The individual portion of this quiz has one page of questions plus this title two pages. Please make sure you have all pages. Place your name (last name first) and your student number (or your Social Security number) in the spaces above and sign on the line. *Initial each page of the exam in the top right hand corner* so that if your exam pages get separated I can match them to you.

To obtain maximum credit for each question, show your work in detail. Partial credit for questions will not be assigned if no work is shown. **Indeed, no credit will be granted if complete work is not shown even for correct answers.** Feel free to use pictures/diagrams to illustrate your text answers and/or to use short text explanations to explain your drawings if your pictures are ambiguous. If you have to make assumptions, etc., to complete any answers, write me a short note stating and/or explaining your assumptions and testing them to the degree possible.

On some questions on this exam, you are given a choice about which 3 out of 4 parts to answer. On these questions, be sure that you circle the part numbers of those parts you want me to grade. [Note: If you do not indicate your choice, I will count only the first 3 parts towards the grade.]

You have 20 minutes for the individual part of this quiz. The thirty points for the individual part of this quiz correspond to 7.5% of the 100 overall points for this course.

Grade /30 (individual) \Rightarrow /7.5%

1 (30 points total). Answer 3 out of 4 parts below. Indicate the 3 parts you want me to grade by circling their part numbers.

- a. Explain each of the observations.
1. The inside of a car left in the sun may become hot enough to endanger the lives of pets and small children
 2. Clear winter nights tend to be colder than cloudy ones.
 3. There is a much wider daily temperature variation in a desert than in a moist environment.
- b. Calculate the formula weight and the percent oxygen in water.
- c. Write the Lewis structures and indicate the approximate bond angles associated with each carbon and nitrogen in the molecules.
1. H_2O
 2. NH_3
 3. CO_2
 4. (Freon) CCl_2F_2
- d. Nitrogen gas comprises nearly 78 % and oxygen gas 21% of our atmosphere but they are not greenhouse gases such as methane, carbon dioxide and CFC's. Explain the greenhouse effect in terms of the greenhouse gases.

Chemistry 1500, Dr. Hunter

Summer 2004

Quiz # 4 (Group Part)

Name: _____, _____ Signature: _____

Name: _____, _____ Signature: _____

Name: _____, _____ Signature: _____

Name: _____, _____ Signature: _____

Name: _____, _____ Signature: _____

Name: _____, _____ Signature: _____

Last name**First name**

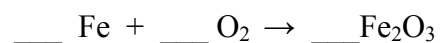
The group portion of this quiz has one page of questions plus this title two pages. Please make sure you have all pages. Place the names (last name first) and signatures of each group member above. *Initial each page of the exam in the top right hand corner* using the initials of the first group members so that if your exam pages get separated I can match them to your group.

To obtain maximum credit for each question, show your work in detail. Partial credit for questions will not be assigned if no work is shown. **Indeed, no credit will be granted if complete work is not shown even for correct answers.** Feel free to use pictures/diagrams to illustrate your text answers and/or to use short text explanations to explain your drawings if your pictures are ambiguous. If you have to make assumptions, etc., to complete any answers, write me a short note stating and/or explaining your assumptions and testing them to the degree possible.

You have 20 minutes for the group part of this quiz. The ten points for the group part of this quiz correspond to 2.5% of the 100 overall points for this course.

Grade /10 (group) \Rightarrow /2.5%

1 (10 points total). Balance the following equation:



2 Determine the number of moles of iron present in 224 g Fe.

3 Use your balanced equation to determine the number of moles of iron(III) oxide that is produced.

4 How many grams of Fe_2O_3 would be produced?

1 (30 points total). Answer 3 out of 4 parts below. Indicate the 3 parts you want me to grade by circling their part numbers.

a. Explain each of the observations.

1. The inside of a car left in the sun may become hot enough to endanger the lives of pets and small children

Radiation enters car.
Absorbed
(IR) Heat trapped inside car.

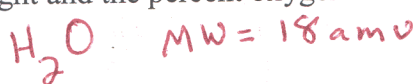
2. Clear winter nights tend to be colder than cloudy ones.

Cloud cover retains heat.

3. There is a much wider daily temperature variation in a desert than in a moist environment.

Moisture & cloud cover are not present.

b. Calculate the formula weight and the percent oxygen in water.



$$\%O = \left(\frac{16}{18}\right)100 = 88.8\%$$

c. Write the Lewis structures and indicate the approximate bond angles associated with each carbon and nitrogen in the molecules.

1. H_2O



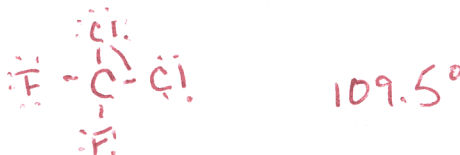
2. NH_3



3. CO_2



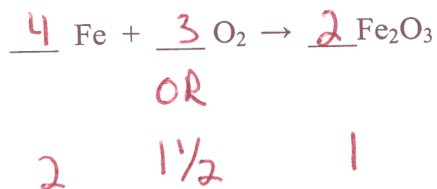
4. (Freon) CCl_2F_2



d. Nitrogen gas comprises nearly 78 % and oxygen gas 21% of our atmosphere but they are not greenhouse gases such as methane, carbon dioxide and CFC's. Explain the greenhouse effect in terms of the greenhouse gases.

Greenhouse gases absorb radiated energy from the earth and vibrate at certain frequencies.

1 (10 points total). Balance the following equation:



2 Determine the number of moles of iron present in 224 g Fe.

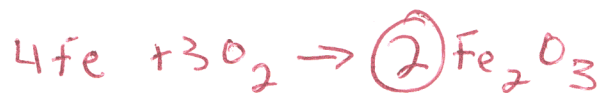
$$\frac{x \text{ mol}}{224 \text{ g}} = \frac{1 \text{ mol}}{56 \text{ g}}$$

$$x = \frac{224 \text{ g} (1 \text{ mol})}{56 \text{ g}}$$

$$x = 4 \text{ mol}$$

3 Use your balanced equation to determine the number of moles of iron(III) oxide that is produced.

if Fe = 4 mol normal reaction



$$2 \text{ mol Fe}_2\text{O}_3$$

4 How many grams of Fe₂O₃ would be produced?

from PT

$$\frac{x \text{ g}}{2 \text{ mol}} = \frac{160 \text{ g}}{1 \text{ mol}}$$

$$x = \frac{160 \text{ g} (2 \text{ mol})}{1 \text{ mol}}$$

$$x = 320 \text{ g}$$