

City College, Chemistry Department
Chemistry 10301, sections T and T2, Prof. T. Lazaridis
First Midterm exam, Sep. 22, 2005

Name (last name first): _____

I.D. Number: _____

Workshop leader: _____

**Note: There are 5 questions in this exam (check both sides of the sheet).
Fill in your answer in the blank space provided immediately following each question. Half
a point will be subtracted every time you report a numerical result with an incorrect
number of significant figures. A copy of the periodic table is attached. Good luck!**

1. a. (4) What is the formula of ammonium phosphate?

- b. (4) What is the mass of one mole of methanol (CH_3OH) ?

- c. (4) How many protons and electrons does the sodium ion have?

- d. (4) What is the formula for magnesium hydroxide?

- e. (4) Write the atomic symbols of the elements:

Calcium:

Copper:

Silicon:

Sulfur:

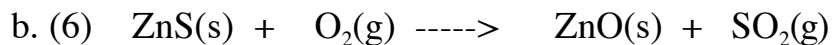
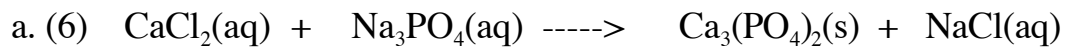
2. Write a balanced equation for each of the following reactions (it is not necessary to indicate the states of each substance):

a. (6) Burning of butane (C_4H_{10}) in oxygen

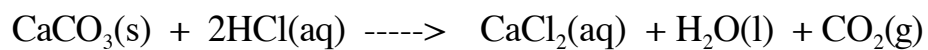
b. (6) Reduction of cassiterite (SnO_2) by carbon to produce metal and carbon monoxide

c. (6) Formation of aluminum chloride from aluminum powder and chlorine gas.

3. Balance the following chemical equations:



4. (15) Consider the following reaction:

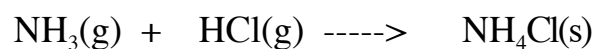


How many grams of calcium chloride will form if 40.0 g of calcium carbonate react with 0.500 mol of HCl, assuming 100% yield?

5. (15) Calculate the percentage composition of Freon-12 (CCl_2F_2)

6. (10) The combustion of 9.29 g of phosphorus produced 21.29 g of a phosphorus oxide. Calculate the empirical formula of the oxide.

7. (10) Consider the reaction of ammonia and hydrogen chloride gases:



A reacting mixture contains 50 g of ammonia and 60 g of hydrogen chloride. Which one is the limiting reactant?