

City College, Chemistry Department
Chemistry 10301, sections T and T2, Prof. T. Lazaridis
Second Midterm exam, Nov. 3, 2005

Name (last name first): _____

I.D. Number: _____

Workshop leader: _____

**Note: There are 7 questions in this exam (check both sides of the sheet).
Fill in your answer in the blank space provided immediately following each
question. 1/2 point will be subtracted every time you report a numerical result
with an incorrect number of significant figures. The last sheet of this exam
contains information that may or may not be needed to answer these questions.**

1. (20) a. (5) What will you obtain by adding MgSO_4 to water?
(Use information provide on your data sheet)

Solution

Heterogeneous Mixture

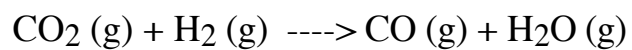
- b. (5) Will a lead pipe dissolve in a solution of silver nitrate and why ?

- c. (5) How many ml of 2.0 M HCl are required to make 500 ml of 0.50 M HCl ?

- d. (5) 50 L of a gas at 5 atm pressure expands at constant temperature until the pressure becomes equal to atmospheric. What will be the volume of the gas after the expansion?

2. (15) How many liters of oxygen, measured at 0 °C and 1.00 atm, are required for the complete combustion of 5.00 g of liquid pentane (C₅H₁₀)?

3. (10) What is the standard enthalpy of the following reaction at 25 °C:



(Hint: use information on your data sheet)

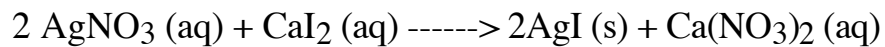
4. (15) The combustion of 1.53 g of glucose, $C_6H_{12}O_6$, raised the temperature of a bomb calorimeter from $22.50\text{ }^\circ\text{C}$ to $25.25\text{ }^\circ\text{C}$. The total heat capacity of the calorimeter was $8.65\text{ kJ/}^\circ\text{C}$. Calculate the constant volume heat of combustion per mole of glucose.

5. (15) The thermochemical equation for the combustion of CO is:



How much heat is generated by burning 50.0 L of CO at $25.00\text{ }^\circ\text{C}$ and constant pressure of 1.00 atm?

6. (15) All the silver in a 45.0-mL portion of silver nitrate solution is precipitated as silver iodide by 26.0 mL of a 0.250 M calcium iodide solution:



Calculate the molarity of the silver nitrate solution.

7. (10) Give the oxidation number of each element in the following compounds:

