CHM 1045 Summer A, 2013
Quiz 7

Name (print)_____

Show your work for complete (and partial) credit. Express your answers to the correct number of significant figures and include units where appropriate. All chemical equations should balance; indicate phases. $q=Cm\Delta T$

1. If the calorimeter and its contents increase in temperature, then: (True or False)
   a) ____ $q_{calorimeter}$ is a positive value.
   b) ____ the reaction occurring in the calorimeter is endothermic.
   c) ____ ΔH_{rxn} is a negative value.

2. Propane, (C_3H_8, 44.09g/mol) is a common fuel gas. Use the following to calculate the grams of propane you would need to provide 369kJ of heat.
   $C_3H_8(g) + 5O_2(g) \rightarrow 3CO_2(g) + 4H_2O(g)$ $\Delta H = -2044kJ$

25.0g of a metal at 100.0°C was placed into a colorimeter containing 100.g of H_2O (specific heat = $4.184Jg^{-1}°C^{-1}$) at 25.00°C. The metal cooled and the water warmed to 27.00°C. Assume that the water in the calorimeter absorbed all the heat given off by the metal. (next 2 questions)

3. How much heat did the calorimeter and its contents absorb?

4. What is the specific heat of the metal?

5 points extra credit: When 50.0 mL of 0.100M HCl was mixed with 50.0 mL of 0.100M NaOH in a cup calorimeter, the temperature increased by 0.64°C. Assuming that the density and specific heat of the resulting solution was the same as water (1.00g/mL, 4.184 4.184J/g°C), calculate $\Delta H°_{rxn}$ (the enthalpy change per mole) for the reaction $HCl(aq) + NaOH(aq) \rightarrow H_2O(l) + NaCl(aq)$.