Grossmont College Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Chemistry 141, Fall 2015

Quiz 4 (20 points) Date: \_\_\_\_\_\_\_\_\_\_\_\_

1 L\*atm= 101.3 J

1. (6 points) A gas absorbs 300.0 J of heat and is compressed from 20.0 to 10.0 L at a constant pressure of 2.00 atm. What is ΔE?
2. (8 point) Adding 2.00 g Mg metal to 95.0 mL 1.00 M HCl in a coffee cup calorimeter forming 95.0 ml MgCl2 (18.02 g/mol) solution with a density of 1.00 g /ml. After the Mg metal was added to the HCl the temperature of the solution rose from 23.7 ºC to 32.9 ºC. (Note: this is a limiting reactant problem) (variation of problem 5.69 from book)

Mg (s) + 2H+ (aq) 🡪 Mg2+ (aq) + H2 (g)

If the molar heat capacity of the MgCl2 solution is the same as that of water (cp=75.3 J/mol x ºC). The heat capacity of the coffee cup calorimeter is negligible. What is ΔHrxn?

1. (6 point) From the following enthalpy changes,

4NH3 (g) + 5O2 (g) 🡪 4NO (g) +6H2O (l) ∆H°= -1602 kJ

4NH3 (g) + 3O2 (g) 🡪 2N2 (g) +6H2O (l) ∆H°= -1530 kJ

Calculate the value of ∆H° for the reaction

N2(g) + O2(g) 🡪 2NO(g)