CHM151 Quiz6A 25 Pts Fall 2012 Name: ****SHOW ALL WORK TO RECEIVE CREDIT****

- 1. The heat of neutralization of HCl by NaOH is $\Delta H^{\circ}_{rxn} = -56.2$ kJ/mol. How much heat is released when 125 mL of 1.750 M HCl is mixed with 195 mL of 0.667 M NaOH? (Be sure to write a balanced equation.)
- 2. Given the specific heat for aluminum is 0.900 J/g·°C, how much heat is released when a 3.8 g sample of Al cools from 450.0°C to 25°C. (atomic mass of Al is 26.98)
- 3. Calculate the heat released (kJ) in the reaction : $C_2H_2(g) + 2H_2(g) \rightarrow C_2H_6(g)$

Given:

$$\begin{array}{ll} 2C_2H_2(g) + 5O_2(g) \to 4CO_2(g) + 2H_2O(g) & \Delta H = -2320 \text{ kJ/mol} \\ 2C_2H_6(g) + 7O_2(g) \to 4CO_2(g) + 6H_2O(g) & \Delta H = -3040 \text{ kJ/mol} \\ 2H_2(g) + O_2(g) \to 2H_2O(g) & \Delta H = -572 \text{ kJ/mol} \end{array}$$

4. The value of ΔH°_{rxn} for the following reaction is –6535 kJ/mol.

$$2C_6H_6(1) + 15O_2(g) \rightarrow 12CO_2(g) + 6H_2O(g)$$

How many kilojoules of heat will be evolved during the combustion of 16.0 g of C₆H₆(1)?

5. Find ΔH°_{rxn} for the reaction

$$\begin{split} 2Ag_2S(s) + 2H_2O(l) &\to 4Ag(s) + \ 2H_2S(g) + O_2(g). \\ [\Delta H^\circ_{\,f} \left(Ag_2S(s) \right) &= -32.6 \ \text{kJ/mol}; \ \Delta H^\circ_{\,f} \left(H_2S(g) \right) = -20.5 \ \text{kJ/mol}; \ \Delta H^\circ_{\,f} \left(H_2O(l) \right) = -285.5 \ \text{kJ/mol}] \end{split}$$

6. Given the following ΔH° values,

$$\begin{split} H_2(g) + \ \ \frac{1}{2} \, O_2(g) \to H_2O(l) & \Delta H^{\circ}_{\,\, f} = -285.8 \ kJ/mol \\ H_2O_2(l) \to H_2(g) + O_2(g) & \Delta H^{\circ}_{\,\, rxn} = 187.6 \ kJ/mol \\ \text{calculate } \Delta H^{\circ}_{\,\, rxn} \text{ for the reaction } H_2O_2(l) \to H_2O(l) + \ \frac{1}{2} \, O_2(g), \end{split}$$