Heat Stoichiometry
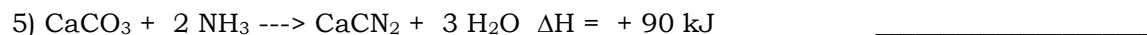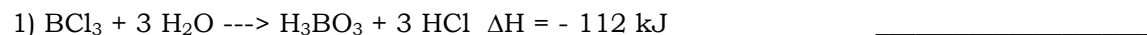
Name: _____

Part 1: Decide whether each of the following is an endothermic or exothermic reaction.
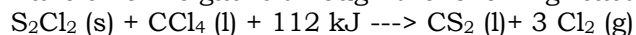
1) BCl_3 + 3 H_2O ---> H_3BO_3 + 3 HCl ΔH = - 112 kJ   _____

2) Br_2 + Cl_2 + 29.4 kJ ---> 2 BrCl   _____

3) 2 HgO ---> 2 Hg + O_2 ΔH= + 181 kJ   _____

4) C_2H_4 ---> 2 C + 2 H_2 + 52.3 kJ   _____

5) $CaCO_3$ + 2 NH_3 ---> $CaCN_2$ + 3 H_2O ΔH = + 90 kJ   _____

6) Si + 2 Cl_2 ---> $SiCl_4$ + 657 kJ   _____

Part 2: Show set up and all work (including units) to receive full credit.

1) Gaseous butane, C_4H_{10}, is burned in cigarette lighters. It reacts with oxygen according to the following equation: 2 C_4H_{10} (g) + 13 O_2 (g) ----->   8 CO_2 (g) + 10 H_2O(g) + 2878 kJ
    How many kilojoules of heat would be provided by the combustion of 20.0 grams of butane?

2) How much heat is absorbed when 3.45 g of MnO_2 decomposes according to the following reaction?
2 MnO_2 (s) ---> 2 MnO (s) + O_2 (g) ΔH = + 264 kJ

3) One way to make chlorine gas is through the following reaction:
        S_2Cl_2 (s) + CCl_4 (l) + 112 kJ ---> CS_2 (l)+ 3 Cl_2 (g)
How many grams of Cl_2 can be produced by supplying 720 kJ of heat to the reaction?

Answers: 1) 496 kJ   3) 1370 g chlorine