**Thermochemical Equations and Calorimetry #2 Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Short Answer**

1. Write the thermochemical equation for the formation of calcium carbonate from the reaction of calcium, carbon and oxygen. The standard molar enthalpy of formation of calcium carbonate is 1207 kJ/mol.

2. Draw an enthalpy diagram to represent the standard molar enthalpy of the combustion of propane. The standard molar enthalpy of combustion for propane is –2220 kJ/mol.

3. Propane gas, C3H8, is used to heat barbecues.

a) How much heat is released when 10.0 g of propane is formed from its elements?

*H*°f C3H8(g) = –104 kJ/mol

b) How much heat is released when 10.0 g of propane undergoes complete combustion?

*H*comb = –2324 kJ/mol

4. Methane burns in oxygen to form carbon dioxide and water. This process releases 890 kJ/mol of methane.

a) Write the thermochemical equation for this reaction.

b) If 18.5 g of methane is burned, how much heat is released?

5. Butane gas, C4H10, is used in barbecue lighters. The butane reacts with oxygen to form carbon dioxide and water in a complete combustion reaction.

a) How much heat is released when 25.0 g of butane is formed from its elements?

*H*°f C4H10(g) = –126 kJ/mol

b) How much heat is released when 25.0 g of butane undergoes complete combustion?

*H*comb = –3003 kJ/mol

6. 1.13 g of calcium reacts in a coffee-cup calorimeter that contains 250.0 g of water. The initial temperature of the water is 15.9C, and the final temperature is 23.8C. Calculate the standard molar enthalpy change for this reaction.

7. A chemist uses a coffee-cup calorimeter to neutralize completely 50.0 mL of 4.77 mol/L HCl with 50.0 mL of NaOH. The temperature change is 33.4C.

a) Calculate the heat of neutralization, in kJ/mol, of HCl.

b) Write a thermochemical equation for the reaction.