**Stoichiometry and ∆H**

Below is the thermochemical equation for the combustion of ethanol in an alcohol burner:

**C2H5OH(l) + 3 O2(g)  2 CO2(g) + 3 H2O (l) + 1418 kJ/mol**

A thermochemical equation includes the amount of heat energy involved in the reaction according to the mole ratios.

Mole ratios:

Write the ∆H notation for the reaction: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

According to the ∆H for this reaction it is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Sketch the graph for this reaction:

**Now for the stoich:**

1) If 5.0 grams of ethanol burns, how many kJ of heat energy will be released?

2) If 1.25 x 105 kJ of heat energy are released, how many grams of water will be produced?

3) If 150 g of carbon dioxide are produced, how many kJ of heat energy were released?

Let’s bring the 4 step problem together with the stoich:

**4)** If 5.00 g of oxygen are used to burn methane gas to heat up 250. mL of water to 92.0 oC, what was the initial temperature of the water?

**CH4 (g)   +   2 O2 (g)    CO2 (g)   +   2 H2O (g) + 802.3 kJ**