Chem II – Enthalpy Worksheet II Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Calculate the molar enthalpy of solidification (ΔHsolidification) when 10.00kJ of energy are lost as 30.00g of water are frozen at 0ºC. Remember that this value will be negative, because energy is lost when water freezes. (Hint: start by finding out how many moles of water that are freezing)

1. Calculate the molar enthalpy of condensation (ΔHcondensation) for ammonia when 50.0g of NH3 gas turn into a liquid at its boiling point. 68,500J of energy are released in the process.

1. Calculate the energy absorbed when 2000 g of dry ice (CO2) sublimate at the normal sublimation point. The molar enthalpy of sublimation is 8.647kJ/mol.

1. Methane (CH4) has a normal boiling point of -161.6 ºC. At this temperature, the ΔHcondensation = -8.17kJ/mol. If 16.5g of liquid methane vaporize, how much energy is absorbed?

1. How much energy is required to melt a 20.0 lb bag of ice at 0ºC? A pound (lb.) of ice is equivalent to 0.4536 kg. The ΔHfusion of ice is +6.009kJ/mol.

1. When water vaporizes at its normal boiling point, its ΔHvaporization is +40.79kJ/mol. Calculate the number of moles of water that condense if 3456kJ of energy are released.

1. What mass of aluminum metal would absorb 250.0 kJ when it melted at its melting point? The molar enthalpy of fusion for aluminum is +10.71kJ/mol.
2. 9.0 grams of charcoal (C) were completely consumed in a bomb calorimeter. If we assume that the 2.0 L of water absorbed all of the heat released by the charcoal, and if the temperature of the water increased from 20.25 to 56.04oC, what is the molar enthalpy of carbon?
3. CS2, a very flammable liquid, has a molar enthalpy of -1028 kJ/mole. What do you expect aluminum's final temperature to be if 1.0 kg of Al is initially at 20.0 C, and it absorbs all the heat from the following sample of CS2:
* mass of CS2 before burning: 22.6 g
* mass of CS2 after burning: 11.6 g
* specific heat capacity of Al: 0.900 J/[g C]
1. 300 mL of 0.2 M aqueous KOH neutralizes 150 mL of aqueous 0.2 M H2SO4. We go from an average initial temperature of 22.3 ۫C to a maximum of 29.2 ۫C. Calculate the molar heat(enthalpy) of neutralization of KOH.
2. A student mixed 50.00 mL of 1.00 M HCl and 51.00 mL of 1.00 M NaOH both solutions having an initial temperature of 25.5 $۫$C. After mixing, a maximum temperature of 32.2 °C is measured. Calculate the enthalpy change for the neutralization reaction.