**Thermochemistry review** Name \_\_\_\_\_\_\_\_\_­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_ Calculate the ∆ H for the following reaction:

C2H5OH + O2 → CH3CO2H + H2O (g)

\_\_\_\_\_\_\_\_\_\_\_\_\_Calculate the heat of combustion for 500 g of ethane (C2H6)

\_\_\_\_\_\_\_\_\_\_\_\_\_A calorimeter contains 125 mL of water at 20.0 °C. A reaction in the calorimeter raises the temperature of the water to

96.0 °C. What is the heat of the reaction?

\_\_\_\_\_\_\_\_\_\_\_\_\_How much heat is needed to melt 75 g of water?

\_\_\_\_\_\_\_\_\_\_\_\_\_ How much heat is released when 75 g of steam freezes to ice.

\_\_\_\_\_\_\_\_\_\_\_\_\_ 5 g of iron (shc = 0.89 J/g°C) at 200 °C is placed in 200 mL of H2O at 20 °C. Calculate the final temperature of both.

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Consider the following reaction: 2 K + 2 H2O → 2 KOH + H2 ∆H rxn = -278 kJ

\_\_\_\_\_\_\_\_\_\_\_A 75 g sample of potassium is put into 250 mL of water at 21 °C. What is the final temperature after this reaction is

completed?

\_\_\_\_\_\_\_\_\_\_\_ What will the final temperature of the water be if the amount of potassium put into the water is doubled?

\_\_\_\_\_\_\_\_\_\_\_\_\_ Calculate the heat of formation for the underlined compound.

4 V + 3 O2 →2V2O3 ∆Hrxn = -6425 kJ

Temperature

\_\_\_\_\_\_\_\_5. Draw the heating curve

for water on the axes provided.

Please label all 3 states of matter,

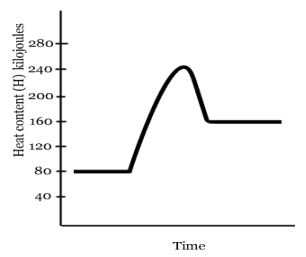
2 phase changes and the melting

and boiling of water. Starting temp

is 0oC and ending temp is 115oC

Time

\_\_\_\_\_\_\_\_ How much heat is needed to boil 5.0 g of ice at a temperature of 0oC to 115oC? Your graph above should help guide you. Show on a separate sheet of paper.

Use Energy Diagram to the right to answer the following.

\_\_\_\_\_\_\_\_ The Hf of the reactants of the forward reaction is about

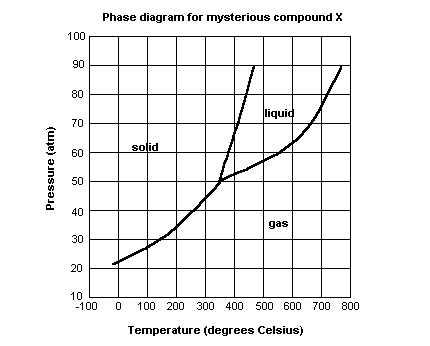
\_\_\_\_\_\_\_\_ The Hf of the products of the forward reaction is about

\_\_\_\_\_\_\_\_ The activation energy of the forward reaction is about

\_\_\_\_\_\_\_\_ The heat of reaction (∆H) of the forward reaction is about

\_\_\_\_\_\_\_\_ Is the forward reaction exothermic or endothermic

\_\_\_\_\_\_\_\_ The heat of reaction (∆H) of the reverse reaction is about



**Use Phase Diagram above to answer the following:**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ At what temperature and pressure will all three phases coexist?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ If I have a bottle of compound X at a pressure of 45 atm and temperature of 1000 C, what will happen if I raise the temperature to 4000 C? (Specify phase change.)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ If compound X is nontoxic, would you be able to drink it in the liquid form?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ If I have a bottle of compound X at a pressure of 70 atm and temperature of 7500 C, what will happen if I lower the temperature to 6000 C? (Specify phase change.)

Which sugar will give you more energy per molecule: glucose, C6H12O6 or sucrose, C12H24O12  and why?