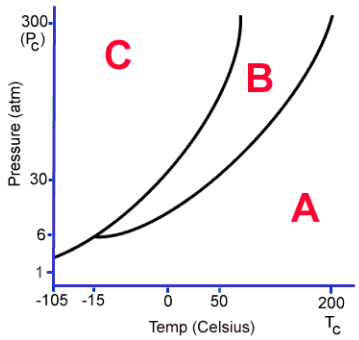
Dougherty Valley HS Chemistry
Thermochemistry – Molar Heats and Odds and Ends

Worksheet #7

Name: **Period:** **Seat#:**



1) Which area of the graph represents the liquid phase?

2) Which area of the graph represents the gas phase?

3) A phase change from Phase A to Phase B is known as what?

4) A phase change from Phase B to Phase C is known as what?

5) A phase change from Phase C to Phase A is known as what?

6) At 30 atmospheres pressure, the melting point of this substance is what?

7) What phase change occurs when the temperature of the substance is held constant at -15 ºC, and the pressure increases from 1 atmosphere to 30 atmospheres?

8) A phase change from Phase B to Phase A is known as what?

9) A phase change from Phase C to B is known as what?

10) Above 200°C what is the only phase that cannot exist for this substance?

11) The triple point of this substance occurs at what temperature and pressure?

12) At 30 atmospheres pressure, the boiling point of this substance is what?

13) At -50°C, which phase cannot exist for this substance?

14) Explain what the triple point is.

15) Explain what the critical point is.

16) Determine the final temperature when 18.0 g of ice at -10.0 °C mixes with 275.0 grams of water at 60.0 °C *51.1°C*

17) Determine the final temperature when 10.0 g of steam at 100.0 °C mixes with 500.0 grams of water at 25.0 °C. *37.07°C*

18) You have an unknown quantity of ice. You put all the ice into a cup with 110g of water. If the water temperature decreases by 14 degrees, and the final temperature is 12°C, what was the mass of the ice that you put in the cup? *16.76 g*

19) How much energy does it take to heat a 3.45 mole sample of silver from 15°C to 120°C if the specific heat of silver is 0.240 J/g°C? *9378.18 J*

20) A 75 g piece of copper (which has a molar heat capacity of 24.8 kJ/mol•K) is heated to 68°C and dropped into a calorimeter containing water (specific heat capacity of water is 4.18 J/g°C) initially at 20°C. The final temperature of the water is 26.5°C. Calculate the mass of water in the calorimeter. *44698 g*

21) If the temperature of a 50.0 gram block of aluminum increases by 10.9K when heated by 500 Joules, calculate the specific heat of the aluminum block and the molar heat capacity of the aluminum block. *0.917 J/g°C, 24.8 J/mol°C*

22) The specific heat of gold is 0.128 J/g•K. Calculate the molar heat capacity. *25.21 J/mol•K*

23) Calculate the amount of heat necessary to melt 27 grams of ice if the molar heat of fusion of ice is 6.009 kJ/mol. Use the molar heat value given here (not regular latent heat in grams), and get your answer in kJ. *9.01 kJ*

24) The specific heat capacity for silver is 0.24 J/g°C. Calculate the molar heat capacity of silver. *25.89 J/mol•K*

25) If it takes 585 J of energy to raise the temperature of 125.6g Hg from 20°C to 53.5°C. Calculate the specific heat capacity and the molar heat capacity of Hg. *0.139 J/g°C, 27.89 J/mol°C*

26) If the molar heat capacity of Magnesium is 24.89 J/mol•K, calculate the energy required to heat 35 grams of magnesium from 30°C to 55°C. *895.9 J*

27) $B_2O_3 + 3H_2O \rightarrow 3O_2 + B_2H_6 \quad \Delta H = +2035$ kJ

a. Is this reaction endo or exothermic?

b. Rewrite the equation with the heat written as a reactant or a product based on your answer to part A

c. How much energy is involved when 15grams of B_2O_3 is reacted, and is it absorbed or released? *436.6 kJ*

28) If the ΔHrxn for the combustion of tetracarbon decahydride is -5756 kJ, how much energy is released when 50 grams of the fuel is combusted? *-2475.9 kJ*