Met 320 HQ 3 Compilation

5. Estimate the heat of vaporization of Mg from the following data, the vapor pressure at the melting point (922K) is 4.08 x 10^{-3} atm and its boiling point is 1363K.

6. Complete
   a. reduced temperature = _____
   b. reduced pressure = _____
   c. definition of chemical potential _____
   d. definition of fugacity _____
   e. criterion of equilibrium at constant T & P _____

3. Calculate Gibbs energy change when one mole of pure, liquid Cu reacts with O_2 at 1 atm to form pure, solid Cu_2O at 1423 K.

4. Repeat Problem #3 with the following modifications: Cu is in solution with Ag at a mole fraction of copper of 0.2; the O_2 is at 10^{-4} atm; the Cu_2O is liquid dissolved in molten borax glass that is saturated with solid Cu_2O. (10)

4. Write the Big 6 equations and describe the standard state for each.

3. Real Gas Problem:
   a) What volume would one gram mole of ideal gas occupy at 304 K and 73 atm?
   b) What volume would one gram mole of CO_2 gas occupy at 304 K and 73 atm?

1. Set up a reaction extent problem for

   $3H_2 + N_2 = 2\ NH_3$ $\quad K_{EQ} = 1.2$ $\quad P_T = 5$ atm

   The table below shows the number of moles of each component initially.

Species	Moles initially		
NH_3	2		
H_2	1		
N_2	1		
total	4		

4. Estimate the melting point of ice at 200 atm. The heat of fusion for ice is approximately 340 J/gram and the density of ice is 0.9 grams per cubic cm.

x.
   b) What is the difference between ΔG and ΔG^o?

Next time:
   c) What is the Relative partial molar heat of mixing for an Ideal solution?

5. Use the data given below for the liquid Cu-Sb system at 1190 K to determine the enthalpy change when (assume all components start in the liquid state at 1190 K)
   a) 1 mole of Sb and 4 moles of Cu are mixed at 1190 K
   b) 10 moles of Cu are dissolved in a large quantity of Cu-Sb alloy having a mole fraction of Cu of 0.3.