

Quiz #8
Name _____

Week: Nov. 7 – Nov. 9
Chemistry 331

Equations and constants:

$$R = 8.31 \text{ J/mol-K} = 0.08206 \text{ L-atm/mol-K}, \Delta H_{\text{vap}} = 41.6 \text{ kJ/mol}, \Delta H_{\text{fus}} = 6 \text{ kJ/mol}$$

$$\delta w = -PdV, dU = C_v dT, dH = C_p dT, dH = dU + PdV$$

$$W = \sigma T^4, \rho = \frac{8\pi h\nu^3}{c^3} \frac{1}{(e^{h\nu/kT} - 1)}, dU = \delta w, C_v = \frac{3}{2}nR$$

$$C_p = \frac{5}{2}nR, \ln\left(\frac{P_2}{P_1}\right) = \frac{\Delta H_{\text{vap}}}{R}\left(\frac{1}{T_1} - \frac{1}{T_2}\right), \ln\left(\frac{K_2}{K_1}\right) = \frac{\Delta H^\circ}{R}\left(\frac{1}{T_1} - \frac{1}{T_2}\right)$$

$$\ln(a_2) = \frac{\Delta H_{\text{fus}}}{R}\left(\frac{1}{T_1} - \frac{1}{T_2}\right), \ln(a_2) = -\frac{\Delta H_{\text{vap}}}{R}\left(\frac{1}{T_1} - \frac{1}{T_2}\right), \Pi = cRT$$

1. What is the vapor pressure of water at 50 °C?

Vapor pressure = _____ (atm)

2. What is the vapor pressure of water in an ideal solution of 0.5 mole fraction of glycerol and water.

Vapor pressure = _____ (atm)

3. Estimate the boiling point elevation of water in a 0.5 mole fraction solution of glycerol.

Boiling Point = _____ (K).