Chem 112 Spring 2020 Quiz 1 Whelan

SID | | | | | | | | | Last Key First Answer

Question 1
6 Points

From the following **vapor pressure data** for iodomethane, calculate the molar heat of vaporization of CH_3I

P = 100 mm Hg @ 266K
P = 400 mm Hg @ 298K

Must Show Work for Full Credit – R = 8.314 $J.mol^{-1}.K^{-1}$

$$\ln\frac{P_2}{P_1} = \frac{\Delta H^\circ_{VAP}}{R}\left(\frac{1}{T_1} - \frac{1}{T_2}\right)$$

$P_1 = 100$ $T_1 = 266$
$P_2 = 400$ $T_2 = 298$

$$\ln\frac{400}{100} = \frac{\Delta H^\circ_{VAP}}{R}\left(\frac{1}{266} - \frac{1}{298}\right)$$

$$R\ln 4 = \Delta H^\circ_{VAP}\,(4.037\times10^{-4})$$

$$8.314\,(1.386) = \Delta H^\circ_{VAP}\,(4.037\times10^{-4})$$

$$\Delta H^\circ_{VAP} = \frac{8.314\,(1.386)}{4.037\times10^{-4}}$$

$$\Delta H^\circ_{VAP} = 2.85\times10^{4}\ J.mol^{-1}$$

28.5 kJ.mol^{-1}

Question 2
4 Points

What type(s) of **intermolecular forces** are expected between CH_3NH_2 molecules?
Circle all those that apply.

- ☐ Ion – Ion
- ◯ Dipole – Dipole
- ◯ Induced Dipole – Induced Dipole
- ☐ Ion – Dipole
- ◯ Hydrogen bonding