

Intermolecular Forces:

1. a. Even though both exhibit hydrogen bonding, C_2H_5OH has (in addition) a greater molar mass \rightarrow greater dispersion forces.

b. The greater dispersion forces of CCl_4 must ~~outweigh~~ ^{be more important} the dipole-dipole (and dispersion forces) of $CHCl_3$.

c. Lower vapor pressure indicates greater intermolecular forces as well. $BeCl_2$ exhibits an ion-ion attraction which is stronger than the non polar, CCl_4 's dispersion forces.

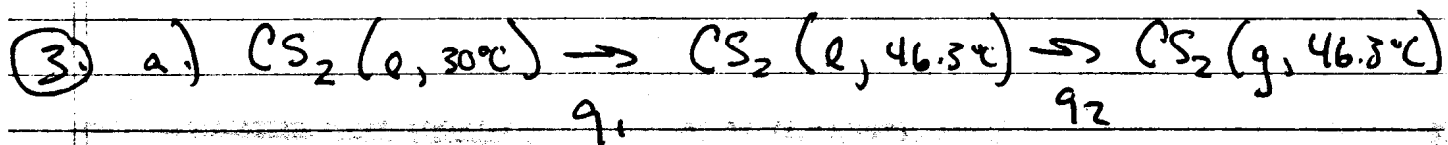
2. a. high - CH_3OH , low - CH_4

b. high - CH_4 , low - C_6H_6 V.P. $\propto \frac{1}{IF}$

c. high - C_5H_{10} , low - C_2H_6

* d. (high - H_2O (100°C) HF (19.7) ; low - NH_3 (-33)) \rightarrow * This one's tough, try to rationalize why!

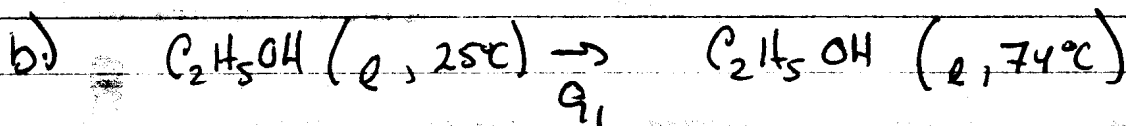
$$\text{Molar Mass} = 76.1$$



$$q_1 = m C \Delta T = 100 \text{g} \left(\frac{2.32 \text{J}}{\text{g}^\circ\text{C}} \right) (46.3 - 30.0) \\ = 3,791.6 \text{ J}$$

$$q_2 = n \Delta H_{\text{vap}} = \frac{100 \text{g}}{76.1} \left(\frac{28.4 \text{kJ}}{\text{mol}} \right) = 37.3 \text{ kJ}$$

$$q_{\text{TOT}} = 3.8 \text{ kJ} + 37.3 \text{ kJ} = \boxed{41.1 \text{ kJ}}$$



$$q_1 = m C \Delta T = 2.50 \text{ mol} \left(\frac{46.08 \text{g}}{\text{mole}} \right) \left(\frac{2.45 \text{J}}{\text{g}^\circ\text{C}} \right) (74 - 25)$$

~~Mol~~ $\text{Molar Mass} = 46.08$

$$= 13,830 \text{ J} = \boxed{13.8 \text{ kJ}}$$