

Chemistry 230

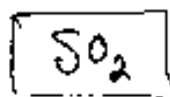
Problem Set #2

- $M = 30.1 \text{ g/mol} \quad - \quad \text{C}_2\text{H}_6$
- $0.9345 \text{ g/L} \quad \text{C}_2\text{H}_2$
- $\text{N}_2 - 0.133 \text{ mol}; \quad \text{H}_2 - 0.400 \text{ mol}; \quad \text{NH}_3 - 1.333 \text{ mol}$
- | | | | | |
|-------|---|-----------|-----------|------------------------------------|
| 411 K | - | 0.421 mol | (0.421 g) | Note: P is the same in both bulbs. |
| 299 K | - | 0.579 mol | (0.579 g) | |
- For (b) it may be easier to calculate $\left(\frac{\partial T}{\partial P}\right)_{V_m}$ + show that it equals κ/α .

$$6. \quad \left. \begin{array}{l} \alpha \approx 2.6 \times 10^{-4} \text{ K}^{-1} \\ \kappa \approx 4.8 \times 10^{-5} \text{ atm}^{-1} \end{array} \right\} \left(\frac{\partial P}{\partial T}\right)_{V_m} \approx 5.5 \frac{\text{atm}}{\text{K}}$$

$$7. \quad (\Delta P)_V \approx 22 \text{ atm} \rightarrow P_{20^\circ\text{C}} \approx 23 \text{ atm}$$

$$8. \quad \lim_{P \rightarrow 0} \left(\frac{P}{P}\right) = 2.858 \frac{\text{g}}{\text{L} \cdot \text{atm}} \Rightarrow M = 64.06 \frac{\text{g}}{\text{mol}}$$



$$9. \quad T_{\text{app}} = 273.16 \cdot \left(\frac{P_{100^\circ\text{C}}}{P_{\text{ref}}}\right) = \begin{array}{l} 374.77 \text{ K} \left(\frac{n}{V} = 0.1000\right) \\ 373.63 \quad (0.030000) \\ 373.32 \quad (0.010000) \end{array}$$