Secret Code 20:

Problem Set 4

4.1A)
1)
$$\Delta \bar{S}_{m} = \frac{\Delta \bar{H}_{m}}{T_{m}} = \frac{9.9 \, \text{k} \, \text{3/mol}}{278.6 \, \text{H}} = 0.0355 \, \text{KJ.mol}^{-1} \, \text{K}^{-1}$$
2) $\Delta \bar{S}_{V} = \frac{\Delta \bar{H}_{V}}{T_{V}} = \frac{33.9 \, \text{k} \, \text{3/mol}}{353.9 \, \text{k}} = 0.0960 \, \text{kJ.mol}^{-1} \, \text{k}^{-1}$

H. IAC)
$$dH^{solid} = C_P dT$$

From Fit:
 $C_P^{solid}(T) = 0.441 T$
 $\int_{H_1}^{0} dH = \int_{T_m=278.6}^{0.441} T dT$
 $H|_{H}^{0} = 0.441 T^2|_{T}^{278.6}$
 $O = H = 0.441 (278.6)^2 - 0.441 T^2$
 $H^{solid}(T) = 0.441 T^2 - 34229.52$

4.1A.D)
$$d\bar{S} = \frac{CP}{T} dT$$

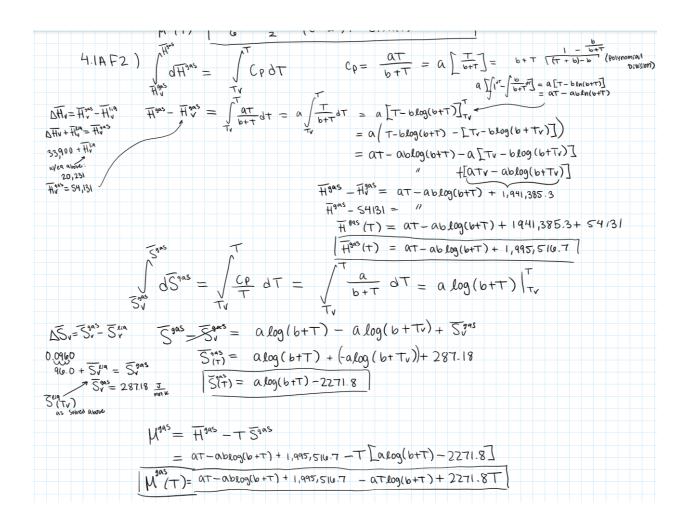
$$\int_{0}^{5} d\bar{S} = \int_{0}^{10} \frac{1}{10} dT$$

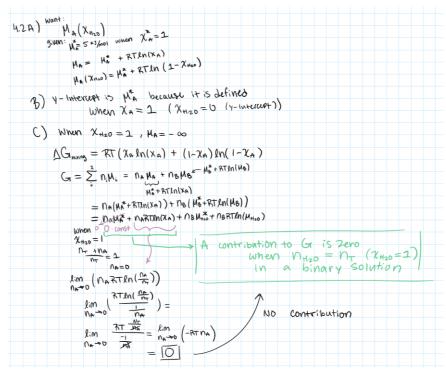
$$\left[\frac{S^{\text{solid}}}{S^{\text{solid}}} = 0.4411T \right]$$
4.1A.E) $\mu^{\text{solid}} = H^{\text{solid}} - TS^{\text{solid}}$

$$\mu^{\text{solid}} = 0.441T^{2} - 34229.52 - 0.441$$

$$\left[\frac{M^{\text{solid}}}{M^{\text{solid}}} = -34229.52 - 0.441 \right]$$

4.1A. F1)
$$\int_{Hm}^{H} \frac{dH}{dH} = \int_{Tm}^{T} \frac{c\rho^{4}dT}{c\rho^{4}dT} + \int_{Ch^{10}}^{Ch^{10}} \frac{1}{c^{10}} \frac{1}$$





$$\begin{array}{l} G_{mxeb} = G_{unnixed} \\ + 3) \Delta(x_{mxing} = n_{A}\mu_{A} + n_{B}\mu_{B} + n_{B}\mu_{C} - [n_{A}\mu_{A}^{*} + n_{B}\mu_{B}^{*} + n_{C}\mu_{C}^{*}] \\ = n_{A}(\mu_{A}^{*} + RTLn(\chi_{A})) + n_{B}(\mu_{B}^{*} + RTLn(\chi_{B})) + n_{C}(\mu_{C}^{*} + RTLn(\chi_{C})) - n_{A}\mu_{A}^{*} - n_{B}\mu_{B}^{*} - n_{C}\mu_{C}^{*} \\ = n_{B}\mu_{A}^{*} + n_{A}RTLn(\chi_{A}) + n_{B}\mu_{B}^{*} + n_{B}RTLn(\chi_{B}) + n_{C}\mu_{C}^{*} + n_{C}RTLn(\chi_{C}) - n_{A}\mu_{A}^{*} - n_{B}\mu_{B}^{*} - n_{C}\mu_{C}^{*} \\ \Delta n_{mxing} = RT[n_{A}ln(\chi_{A}) + n_{B}ln(\chi_{B}) + n_{C}ln(\chi_{C})] \\ \Delta n_{ixing} = RT[\chi_{A}ln(\chi_{A}) + \chi_{B}ln(\chi_{B}) + \chi_{C}ln(\chi_{C})] \\ \Delta n_{ixing} = RT[\chi_{A}ln(\chi_{A}) + \chi_{B}ln(\chi_{B}) + \chi_{C}ln(\chi_{C})] \\ \Delta n_{ixing} = RT[\chi_{A}ln(\chi_{A}) + \chi_{B}ln(\chi_{B}) + \chi_{C}ln(\chi_{C})) \end{array}$$