The Thermodynamics of Phase and Reaction Equilibria

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Errata

p. 43 - Table 3.2

The parameter A for the van der Waals equation of state should be written as

$$A = \frac{27}{64}\left(\frac{P_r}{T_r^2}\right)$$

p. 77 - Eq. (3.4-16)

The equation should be written as

$$\Delta\widetilde{S} = R\,\ln\left(\frac{Z_2 - B_2}{Z_1 - B_1}\right) - \frac{RA_2\Gamma_2}{\sqrt{8}\,B_2}\ln\left[\frac{Z_2 + \left(1+\sqrt{2}\right)B_2}{Z_2 + \left(1-\sqrt{2}\right)B_2}\right]$$

$$+ \frac{RA_1\Gamma_1}{\sqrt{8}\,B_1}\ln\left[\frac{Z_1 + \left(1+\sqrt{2}\right)B_1}{Z_1 + \left(1-\sqrt{2}\right)B_1}\right] + \int_{T_1}^{T_2}\frac{\widetilde{C}_P^*}{T}\,dT - R\ln\left(\frac{P_2}{P_1}\right)$$

p. 215 - Problem 6.13

Part (c) of the answer should be

$$\overline{V}_1 = 18.01\,\mathrm{cm}^3/\,\mathrm{mol} \qquad \overline{V}_2 = 54.87\,\mathrm{cm}^3/\,\mathrm{mol}$$

p. 347 - Problem 8.33

The expression for the activity coefficient should be

$$\ln\gamma_i = \frac{\sum_{j=1}^{k}\tau_{ji}G_{ji}x_j}{\sum_{m=1}^{k}G_{mi}x_m} + \sum_{j=1}^{k}\frac{G_{ij}x_j}{\sum_{m=1}^{k}G_{mj}x_m}\left(\tau_{ij} - \frac{\sum_{r=1}^{k}\tau_{rj}G_{rj}x_r}{\sum_{m=1}^{k}G_{mj}x_m}\right)$$

and the answer should be

$$\gamma_1 = 6.3 \qquad \gamma_2 = 1.246 \qquad \gamma_3 = 1.296$$

p. 365 - Example 9.2

The bubble point pressure should be written as

$$P_{\text{bubble}} = x_1\,P_1^{vap} + x_2\,P_2^{vap} + x_3\,P_3^{vap} + x_4\,P_4^{vap}$$

p. 472 - Third line of the first paragraph

Inside and outside diameters should read, "(OD = 315 mm, ID = 258 mm)"

p. 527 - Table 12.2
Table heading should read, "Boiling point elevation constants for various solvents."

p. 546 - Problem 12.19
The answer should be "$x_1^L = 0.608$, $x_1^S = 0.375$"

p. 597 - Problem 13.10
The answer should be "HCl: 24.95, O_2: 5.65, $Cl_2 = H_2O$: 34.41, N_2: 0.59"

p. 613 - Equation (14.3-2)
The element-by-species matrix, $[\boldsymbol{\beta}]$, should be written as

$$
\begin{array}{rc} \text{Species} \rightarrow & \begin{array}{ccccc} \text{CO} & \text{H}_2 & \text{H}_2\text{O} & \text{CH}_4 & \text{CH}_3\text{OH} \end{array} \\ [\boldsymbol{\beta}] = \begin{array}{c} \text{C} \\ \text{H} \\ \text{O} \end{array} & \left[\begin{array}{ccccc} 1 & 0 & 0 & 1 & 1 \\ 0 & 2 & 2 & 4 & 4 \\ 1 & 0 & 1 & 0 & 1 \end{array} \right] \end{array}
$$

p. 669 - Appendix C
For chloroform $A = 9.3530$.