KINETICS

In this file I will correct important errors in equations or misleading statements about physics. I will not correct typos in the text, or syntax, or grammatical errors. However, if you have found such errors please let me know. I will collect them just in case that a second edition of the book is issued. Thanks.

► Eq. 4.11 is erroneous. The correct result is in WorkBook 3 and it is

$$\eta(t) = A(0) + \frac{A(0)(B(0) - A(0))}{A(0) - B(0)\exp\{[B(0) - A(0)]kt\}}$$

► In the heading of Table 5.2, $(k_f + k_b)\times 10^{-4}$ must be replaced with $(k_f + k_b)\times 10^{4}$. After this modification, the table tells us that

$$(k_f + k_b)\times 10^{4} = 1.59$$

(for the first row of the table). This gives the correct value

$$k_f + k_b = 1.59\times 10^{-4}\ \text{second}^{-1}$$

► In Table 5.2, the value of B(t) for t = 13,200 seconds should be 11.55 mol/liter (not 1.73 mol/liter). Communicated by Robert Donnelly, Auburn University.

► Professor Donnelly has also pointed out that Exercise 5.11 on page 86 is inconsistent with the data given on pages 80-84. The exercise asks you to assume that the data given in Table 5.2 were obtained for A(0) = 1, B(0) = 0 mol/liter or for A(0) = 3, B(0) = 0.2 mol/liter. Those initial values are impossible in view of the data which tell us that the reaction produced, when it reached equilibrium, 13.28 mol/liter of B (see the line below Eq. 5.32). Short of hiring a top-notch alchemist, one cannot produce so much B in the reaction

$$A \rightleftharpoons B$$

if A(0) = 1 or A(0) = 3. The problem makes sense only if $A(0) > B_e = 13.28$.

To solve Exercise 5.11, you must take A(0) > 13.28 mol/liter. For example, use A(0) = 15 mol/liter and B(0) = 0 mol/liter in one calculation and A(0) = 18 mol/liter and B(0) = 0.2 mol/liter in the other.

► Eq. 6.59 should be (coth is the hyperbolic cotangent)

$$\eta(t) = \frac{2e_0}{\sqrt{\Delta}\coth\left(\frac{t\sqrt{\Delta}}{2}\right) - e_1}$$

► The second equation on page 136 (giving the rate of Br evolution for Reaction 5) is missing the square; it should be

$$\frac{1}{2}\left(\frac{d[\mathrm{Br}]}{dt}\right)_{\mathrm{R5}} = -k_5[\mathrm{Br}]^2$$

This error did not propagate in the rest of the text: Eq. 8.8 uses the correct expression.

► Eq. 9.12 should be (sign changes)

$$C(t) = C(0) + \eta_1(t) - \eta_2(t)$$

► Eq. 9.15 should be (grouping)

$$\frac{d\eta_2(t)}{dt} = k_2\left[C(0) + \eta_1(t) - \eta_2(t)\right]$$