

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

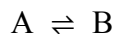
$$(k_f + k_b) \times 10^4 = 1.59$$

(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



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

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

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)

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