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, \((k_f + k_b)\times10^{-4}\) must be replaced with \((k_f + k_b)\times10^4\). After this modification, the table tells us that \((k_f + k_b)\times10^4 = 1.59\) (for the first row of the table). This gives the correct value \(k_f + k_b = 1.59\times10^{-4} \text{ second}^{-1}\)

► 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)

\[ \eta(t) = \frac{2e_o}{\sqrt{\Delta} \coth \left( \frac{t\sqrt{\Delta}}{2} \right) - e_1} \]

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

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

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)

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