ERRATA (for Second Printing, 2012)

An Introduction to Interfaces and Colloids: The Bridge to Nanoscience

The second printing of this book corrected a large number of typographical and other errors that appeared in the First Printing, but additional errors are still being found.

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Chapter 2

p. 27, Table 2-1: For Methylene iodide, the surface tension should be 50.8 mN/m.

p. 27, line 7 below Table 2-1: The reference to Jasper's database is:

p. 28, Line 3 from bottom: Delete “generally good for”

p. 38, Fig. 2-12: The word written as "molecular" in the figure should be "molecular"

p. 42, Table 2-2: "Methyl iodide" should "Methylene iodide"

p. 57, second line from bottom: “btween” should be “between”

p. 69, line 3: “interracial” should be “interfacial”

p. 60-61, Eqs. (2.54), (2.55) and (2.57): The sign in front of the second term should be – instead of +, and after Eq. (2.54): “where Δ refers to the lower phase minus the upper phase.”

p. 73, Eq. (2.73): The equation should read:
\[
\sigma = \frac{r}{2} p_{\text{max}} - \frac{1}{2} \rho grh - \frac{1}{3} \rho gr^2 - \frac{(\rho g)^2 r^3}{12(p_{\text{max}} - \rho gh)},
\]
and it should be referenced as: Based on an approximation for small tubes given in: Johnson, C. H. J., and Lane, J. E., J. Colloid Interface Sci., 47, 117 (1974).

p. 96, Line 12 from bottom: "is separated by phases" should be "separates phases"

p. 101, Eq. (2.125): The equation should read:
\[ \rho g y = \sigma \frac{y''}{\left[1 + (y')^2\right]^{3/2}} - \frac{A_{\text{eff}}}{6\pi x^3} \]

**Chapter 3**

p. 109, Eq. (3.6) should read:
\[ dS = \frac{\delta Q_{\text{rev}}}{T} = \frac{C_s}{T} dT + \left(\frac{\partial p}{\partial T}\right)_v dV \]

p. 110, Eq. (3.11) should read:
\[ dS = \frac{\delta Q_{\text{rev}}}{T} = \frac{C_x}{T} dT + \left(\frac{\partial p}{\partial T}\right)_v dV = \frac{C_p}{T} dT - \left(\frac{\partial V}{\partial T}\right)_p dp \]

p. 130, the third line of Eq. (3.86) should read:
\[ = -\left[ s' + \Gamma_i \left( \frac{C'_i - C''_i}{C'_i - C''_i} \right) \right] dT - \sum_{i=2}^{m} \left[ \Gamma_i - \Gamma_i \left( \frac{C'_i - C''_i}{C'_i - C''_i} \right) \right] d\mu_i \]

p. 136, Caption to Fig. 3-15(b) should read: "Langmuir adsorption isotherm format"

p. 140, line below Table 3-4: "four" should be "five"

p. 142, middle of page: The formula for Triton X-100 should be

\[
\begin{align*}
\text{CH}_3 & \quad \text{CH}_3 \\
\text{H}_2\text{C-} & \quad \text{C-}\text{CH}_2\text{-C-}\text{CCH}_2\text{-C-CH}_2\text{-O-}\text{CH}_2\text{CH}_2\text{-O}\text{H}
\end{align*}
\]

p. 166, Ref 62: "Zasadzinskil" should be "Zasadzinski"

p. 194, line 2 below Fig. 3-51: "and are be" should be: "and are to be"

p. 197, Fig. 3-55: x-axis should be \(C_2(\text{mM})\)

p. 199, Fig. 3-58: x-axis should be \(C_2(\text{mM})\)

**Chapter 4**

p. 224, line 4: no comma after "cos \(\theta\)"

pp. 237 (bottom) and 238 (top): Should be precautions 1), 2) and 3)

p. 239, Fig. 4-31: Line F should read: Perfluorolauric acid (monolayer)
p. 250, Eq. (4.44) should read: (CH\textsubscript{3})\textsubscript{2}SiCl\textsubscript{2} + 2 M-OH → M\textsubscript{2}O\textsubscript{2}Si(CH\textsubscript{3})\textsubscript{2} + 2HCl

p. 252, second line from bottom: "positive" should be "negative"

\[ \text{Eq. (4.47), last term should have "−" in front of it, i.e.,} -V \int_{z}^{\infty} \frac{\Pi(z)}{z} dz \]

p. 253, Eqs. (4.48)-(4.50) should read:

\[ \text{(4.48)} \quad \Pi(z) = -\frac{A_{\text{Heff}}}{6\pi z^3} \]

\[ \text{(4.49)} \quad \Delta F_f = -\frac{S_{L/S}V}{h} - \frac{A_{\text{Heff}}V}{18\pi h^3} \]

\[ \text{(4.50)} \quad h_e = \left( -\frac{A_{\text{Heff}}}{6\pi S_{L/S}} \right)^{1/2} \]

p. 266, Line 6ff: Replace the sentence starting on line 6: "The maximum in \( W_A \) under these conditions…" with: "Thus for a given adherend (i.e., given \( \sigma_S \)), the maximum in \( W_A \) occurs when \( \sigma_L = \sigma_S \)."

**Chapter 5**

p. 351, lines 1 and 2: should read: “in which case there is at least one aggregate spanning the entire volume of the system,”

p. 374, add to the paragraph ending after Eq. (5.17):

Equation (5.17) assumes that the sample size \( n \) is sufficiently large that it represents the whole population from which the sample is withdrawn. Otherwise, one needs the sample variance, which is obtained by multiplying the right hand side of Eq. (5.17) by the factor: \( n/(n - 1) \).

p. 375, replace the text from the top with:

It is seen that the variance is the second moment of the distribution about the mean, \( m_2 \), while the mean itself is the first moment about the origin. Two higher moments are often used to further characterize distributions. The third moment about the mean, \( m_3 \), is a measure of the asymmetry of the distribution, and from it may be computed a dimensionless descriptor termed the skewness, \( sk \):

\[ sk = \frac{m_3}{m_2^{3/2}} = \frac{\Sigma f_i (d_i - \bar{d})^3}{(\sigma^2)^{3/2}}. \quad (5.19) \]
Positive values of the skewness describe distributions that tail to the right, while for negative skewness values, they tail to the left. For the distribution of Fig. 5-20, $sk = 1.30$, indicating strong tailing toward the larger particle sizes. For finite samples representing a larger population, a sample skewness is obtained by multiplying $sk$ by the factor: \[ \sqrt{n(n-1)/(n-2)}. \]

A further descriptor of the distribution, termed the kurtosis, $ku$, is constructed from the from the fourth moment of the distribution, $m_4$, and is defined as:

\[
ku = \frac{m_4}{m_2^2} = \frac{\sum f_i (d_i - \bar{d})^4}{(\sigma^2)^2},
\]

(5.20)

The sample kurtosis is obtained by multiplying by \(\frac{(n-1)(n+1)}{(n-2)(n-3)}\). A high kurtosis (Greek = "peakedness"), for a symmetrical distribution, means the central peak is high and sharp. For a Gaussian distribution, described below, $ku$, has a value of 3, while for uniform (flat) distributions it is 1.8. The first four moments of a distribution (or parameters derived from them) allow a quite detailed reconstruction of any monomodal distribution.


pp. 377-378, Eqs. (5.29) and (5.34). The quantity designated as $f_i$ in the last step of these equations is not the same as $f_i$ defined in Eqs. (5.16). Equation (5.29) should be rewritten as:

\[
f_i^* = \frac{n_i^* A_i}{\sum n_i^* A_i} = \frac{n_i A_i}{\sum n_i A_i} = \frac{n_i \pi d_i^2}{\sum n_i \pi d_i^2} = \frac{n_i d_i^2}{\sum n_i d_i^2},
\]

(5.29)

and Eq. (5.34) should be rewritten as:

\[
f_i^* = \frac{n_i^* V_i}{\sum n_i^* V_i} = \frac{n_i V_i}{\sum n_i V_i} = \frac{n_i \frac{1}{3} \pi d_i^3}{\sum n_i \frac{1}{3} \pi d_i^3} = \frac{n_i d_i^3}{\sum n_i d_i^3}.
\]

(5.34)

p. 382, Eq. (5.45) should read:

\[
f(x) = \frac{1}{x \sigma_{\log x} \sqrt{2\pi}} \exp \left[ -\frac{1}{2} \left( \frac{\log x - \log \bar{x}}{\sigma_{\log x}} \right)^2 \right]
\]

(5.45)

p. 392, Fig. 5-33 should be replaced with:
The caption should read:

Fig. 5-33: Settling of a monodisperse suspension: (a) the “falling curtain” of particles all settling at the same rate, and (b) the measured net sediment weight/area, $W$, as a function of time.

Equation (5.62) should read:

$$J = n v_\infty (m_p - m_{med}) g = \frac{dW}{dt} \quad (5.62)$$

p. 388, line below Eq. (5.76): remove “#/cm$^3$”

p. 404, bottom: Remove the sentence starting with: “Assuming that the particles are..”

p. 409, Table 5-8 “Tubidimetry” should be “Turbidimetry”

p. 425, Fig. 5-55: the abscissa should be labeled: $\log(Qa_1)$

p. 439, Caption to Fig. 5-65 should read: “Effect of the size of polystyrene latex spheres on the intensity fluctuations of scattered light over a period of 5 ms. Diameters of spheres: (a) 0.085 µm; (b) 0.220 µm; (c) 1.011 µm.

p. 440, Eq. (5.157) should read:

$$G(\tau) = A_0 + A \exp(-2\Gamma\tau) \quad (5.157)$$

Chapter 6

p. 457, line 1: Faraday’s constant is: 96,485.5 Coul/mole

p. 468, Table 6-3, line 3: “laye” should be “layer”
p. 470, Eq. (6.21), rhs: \( n_{i,\infty} \) should be \( n_{\infty} \)

p. 489, Eq. (6.77), the first “2” on the right hand side should be “8,” i.e.,

\[-\sigma_0 = \left(8kT\epsilon_0n_{\infty}\right)^{\frac{1}{2}} \sinh \frac{Ze\psi_0}{2kT} \tag{6.77}\]

p. 502, Eq. (6.99): The prefatory constant should be 0.069

p. 507, line 5 from bottom: \( V_p = \tau_\Delta \Delta, \) should read: \( V_p = \Delta / \tau_\Delta \)

p. 511, in Eq. (6.122), \( z_\pm \) should be \( z_{\pm}^2 \)

p. 512, line 2: should read: with \( \Lambda_x^0 \) \( [=] \) cm\(^2\)ohm\(^{-1}\)equiv\(^{-1}\): \( \tilde{m}_x = 12.86(z_x^2 / \Lambda_x^0) \)

lines following Eq. (6.123) should read: \(([=] \text{S m}^{-1})\) and \(([=] \text{S})\)

Chapter 7

p. 527, Eq. (7.6), top line: should read:

\[\Phi = -\frac{A}{6}\left[\frac{2a_1a_2}{S_0^2 + 2a_1S_0 + 2a_2S_0} + \frac{2a_1a_2}{S_0^2 + 2a_1S_0 + 2a_2S_0 + 4a_1a_2}\right]\]

p. 533, Eq. (7.33) should read: \( A_{213} = \frac{3}{2}kT\sum_{m=0}^{\infty} \sum_{s=1}^{\infty} \frac{\left(\Delta_{12}\Delta_{13}\right)^s}{s^5} \)

p. 541, line 2 ff. \( (d\psi/dx) \) should be \(- (d\psi/dx)\), so that there should be a “−” in front of \( \rho_e \) in Eqs. (7.46) – (7.48).

p. 542, line 1 below Eq. (7.77): comma needed after “location”

line 1 above Eq. (7.57): “Eqs. (6.16) and (6.1)” should read: “Eqs. (6.18) and (6.19)”

p. 570, Eq. 7.139: Insert “a” in the denominator of the lhs of the equation, which should then read:

\[k_0 = \frac{2kT}{3\mu a} \left[ \int_{z_0}^{\infty} \frac{1}{r^2} \exp \left( \frac{\Phi}{kT} \right) dr \right]^{-1} = \frac{k_0 \text{ (fast agg.)}}{W}\]
Chapter 8

p. 637, Footnote 25: The date of the reference should be (1950).

Chapter 9

p. 625, line 15: “Eq. (8.12)” should be: Eq. (8.14).

p. 645, line 15: “CNS” should read: “SCN–”

p. 651, after Eq. (9.10) should be added “, and \( \rho_c \) is the density of the continuous phase.”

Chapter 10

p. 713, Eq. (10.54) should be: \[ v_x = \frac{h}{2\mu} \left( \frac{d\sigma}{dT} \right) \left( \frac{dT}{dx} \right) \left[ \frac{y^2}{h} \right] - \left( \frac{y}{h} \right) - \frac{3}{2} \right] \] and line 5 from bottom: “2 mm/s” should be “4 mm/s.”

Appendix 1

p. 763, Chapter 8 Prob. 1: last two lines should read: “…Mooney equation, Eq. (8.14), and (iii) the Krieger-Dougherty equation, Eq. (8.16).”

p. 764, Prob. 3: should read: “Estimate the yield stress of a weakly percolated dispersion of 200 nm silica particles…”