

## ERRATA

### An Introduction to Interfaces and Colloids: The Bridge to Nanoscience

The first printing of this book contains a large number of typographical and other errors. Some of the more serious ones are listed below.

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#### Chapter 2

p. 24, Fig. 2-1 Caption, line 3: the second " $r^*$ " should be " $\rho^*$ "

p. 31, line 13: "free electrons" should be "conductance electrons"

p. 53, lines 1 and 2 from bottom: " $R_2$ " should be " $R_1$ "

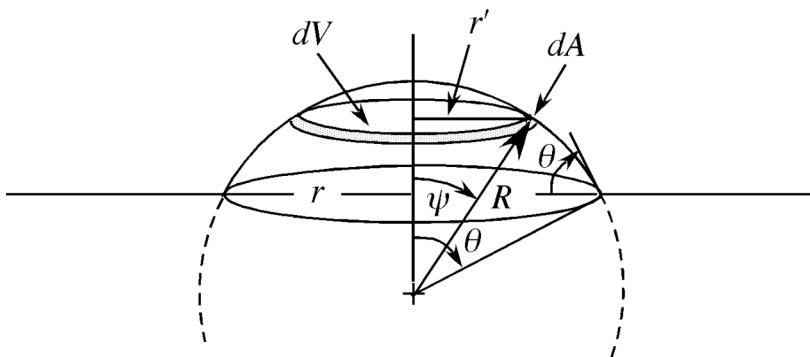
p. 57, line 8 from bottom, and p. 58, line 6 from bottom: "capillary constant" should be "capillary length." In Eq. (2.50), it should read: " $-\rho g y$ "

p. 67, below Table 2-6: it should read "The first estimate is  $a = \sqrt{rh}$ " and "The next estimate is  $a = \sqrt{bh}$ "

p. 90, line 4 from bottom: " $0^\circ\text{C}$ " should be " $20^\circ\text{C}$ "

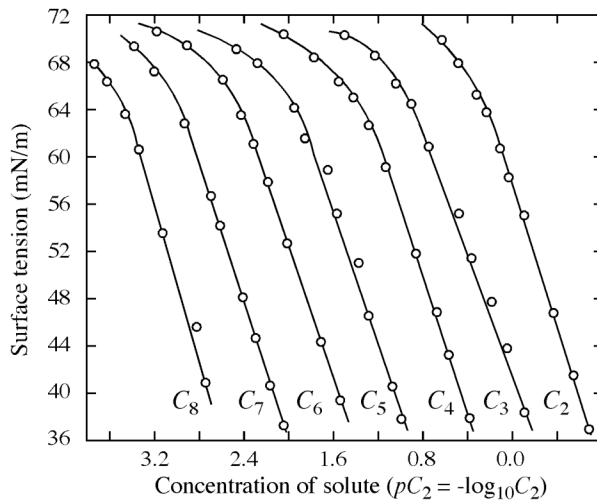
#### Chapter 3

p. 117, lines 7-8 should read: "The element of segment area  $dA$  is the width of the slice,  $Rd\psi$ , times its circumference,  $2\pi r' = 2\pi R\sin\psi$ ." and Fig. 3-4 should be:



p. 135, Fig. 3-14: The units on the  $x$ -axis are moles/liter,  $M$

p. 145, Fig. 3-19 should have the curves labeled, as shown.



p. 147, line 6: " $DS^- Na^+$ " should be " $DS^- + Na^+$ "

p. 150, below Eq. (3.120) should read: "where  $K_N$  is the equilibrium constant for the formation of N-mers.  $x_1$  is the mole fraction of the surfactant as free monomer, while  $x_N$  is the fraction of the total number of monomers which find themselves in N-mers. ( $x_N/N$ ) is thus the mole fraction of N-mers themselves."

p. 173, after Eq. (3.148) "surface equation of state" should be "adsorption isotherm";

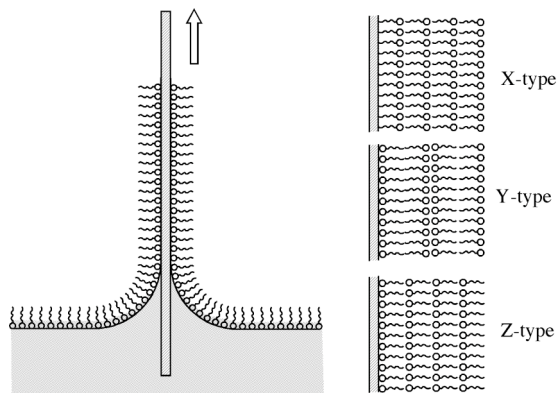
line 14: " $0.70 \mu s$ " should be " $0.5 ms$ "

p. 175, Eq. (3.154) should be: 
$$\frac{d\Gamma}{dt} = k_1 C_\infty (B - \Gamma) - k_{-1} \Gamma;$$

second line from bottom: " $k_1/k_{-1}$ " should be " $k_{-1}/k_1$ ";

Eq. (3.155) should be: 
$$\Gamma = \Gamma_{eq} [1 - e^{-k_1 a(1+k)t}]$$

p. 183, Fig. 3-45 should be as follows. (The types of multilayers were mislabeled in the original.)



p. 186, Eq. (3.160) should be:  $\frac{d\Gamma}{dt} = D_s \frac{\partial^2 \Gamma}{\partial x^2} - k_{-1}\Gamma + k_1(hC)$ , and  $k$  should be  $k_1$  in the line beneath it.

## Chapter 4

p. 216, caption to Fig. 4-3: "(a)" and "(b)" should be inserted under the left and right figures, respectively.

p. 224, line 6: " $\cos\theta$ " should be " $\cos\theta_0$ ", and line 10: " $\cos^{-1}\theta$ " should be: " $\cos^{-1}\theta_0$ "

p. 238, Eq. (4.20) should be:  $\sigma_c = \sigma_{sg}$

p. 252, line 13: "absorbed" should be "adsorbed"

p. 256, Eq. (4.61) should read:  $U \equiv \frac{dr}{dt} \propto \frac{V^3 \sigma}{\mu} \cdot \frac{1}{r^9}$

p. 260, line 16: "Eq. (2.107)" should be "Eq. (2.109)"

p. 268, Footnote 74: " $(\sigma - \sigma^p)$ " should be " $(\sigma - \sigma^d)$ "

p. 276, Third line from bottom: "Eq. (4.86)" should be "Eq. (4.87)"

## Chapter 5

p. 353, line 20: should be " $d^2G > 0$ "

p. 395, line 9: "perpendicular" should be "parallel"; Eq. (5.71):  $(R_1/R_2)$  should be  $(R_2/R_1)$

p. 397, Eq. (5.74) should read:  $\frac{m_p}{f} = S \left( 1 - \frac{\rho}{\rho_p} \right)^{-1}$

p. 402, Eq. (5.86) should read:  $\frac{f}{f_0} = \frac{(1 - \beta^2)^{1/2}}{\beta^{2/3} \ln \left[ \frac{1 + (1 - \beta^2)^{1/2}}{\beta} \right]}$

p. 404, line 5: the variable should be  $n$  rather than  $C_A$ .

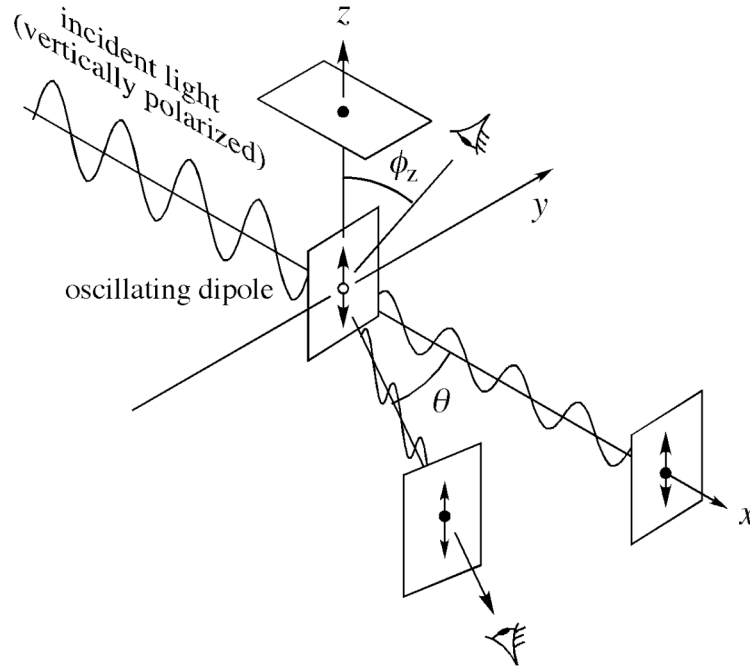
p. 404, line 10: should read "Eqs. (5.50) and.."

p. 408, line 8 from bottom: should read "...Eq. (5.50).  $Y$  must exceed..."

p. 409, line 9 in Table 5-8 should read: "Classical light scattering ( $1 \text{ nm} < d < 10 \text{ }\mu\text{m}$ )"

p. 410, line 18: "one mm" should be "one  $\mu\text{m}$ "

p. 415, Fig. 5-48 should have  $\phi_z$  measured off the  $z$ -axis, as shown below.



p. 419, Eq. (5.114) should read:  $\tau = \frac{1}{V_s} \int \left( \frac{I_\theta}{I_0} \right) dA_r$

p. 423, line 5 from bottom: Should read "For rods of length  $L$ :  $R_g = \frac{1}{2\sqrt{3}} L$ "

p. 425, Fig. 5-55: the slope should be  $-d_f$

p.426, line 4: " $P(Q)$ " should be " $P(\theta)$ "

p. 427, line 1: "*disymmetry*" should be "*dissymmetry*"

p. 433, line 11: Remove redundant text and Eq. (5.150)

p. 439, lines 15ff should read as follows:

" the smaller particles produce fluctuations of higher frequency. Over a time interval,  $\tau$ , beginning at time  $t$ , and short relative to the changes in particle positions, two values of the measured intensity would "correlate" strongly, *i.e.*,  $I(t)$  and  $I(t + \tau)$  would be nearly the same. If many pairs of intensity-values were measured over this short time interval, the average value of the intensity product,  $I(t)I(t + \tau)$ , would be very nearly equal to  $\langle I^2(t) \rangle$ , the average of the *square* of the instantaneous intensity."

p. 440, line 10. Insert the sentence: "As the experimental time  $T$  is extended,  $G(\tau)$  evolves into an unchanging function for a given dispersion."

p. 447, line 3: "Fig. 5-68" should be "Fig. 5-72(b)."

## Chapter 6

p. 470, line 7: "Eq. (6.18)" should be "Eq. (6.20)"

p. 482, line 16: "Eq. (6.58)" should be "Eq. 6.60)"

p. 511, Eq. (6.122) should be: 
$$\tilde{m}_{\pm} = \frac{2\varepsilon\varepsilon_0RT}{3\mu} \frac{z_{\pm}}{\Lambda_{\pm}^0}$$

p. 512, lines 3-5: the text "and when  $m_+$  and  $m_-$  differ, one may compute  $\tilde{m}$  as the harmonic mean between them:  $\tilde{m} = m_+m_-/(m_+ + m_-)$ " should be omitted.

p. 517, Eq. (6.127): "w" should be "ω"

p. 518, Eq. (6.129): should read  $\varepsilon_i^* = \varepsilon_i' + i\varepsilon_i'' + \frac{k_i}{i\omega}$  (the notation for conductivity has been changed to  $k_i$  in this equation and in Eq. (6.130)).

## Chapter 7

p. 526, footnote 1 should be: "Hamaker, H. C., *Physica*, **4**, 1058 (1937)"

p. 528, lines 13 and 14 should read: "..molecules  $j$  (2 or 3), and  $\varepsilon_1(i\nu_m)$  is the dielectric constant of the medium 1, all at *imaginary* frequencies  $i\nu_m$ , where the real frequencies are given by"

p. 534, lines 11-14 and Eq. (7.39) should be: "For the case of slabs of material 2 and material 3 interacting across a medium 1, and assuming that the UV absorption frequencies are approximately the same for the slabs and the medium, *viz.*  $\nu_1$  (again, typically  $\approx 3 \times 10^{15} \text{ s}^{-1}$ ), Eq. (7.33) becomes

$$A_{213} = \frac{3}{4} kT \left( \frac{\varepsilon_1 - \varepsilon_3}{\varepsilon_1 + \varepsilon_3} \right) \left( \frac{\varepsilon_1 - \varepsilon_2}{\varepsilon_1 + \varepsilon_2} \right) + \frac{3h\nu_1}{8\sqrt{2}} \frac{(n_3^2 - n_1^2)(n_2^2 - n_1^2)}{(n_1^2 + n_2^2)^{1/2}(n_1^2 + n_3^2)^{1/2} [(n_1^2 + n_3^2)^{1/2} + (n_1^2 + n_2^2)^{1/2}]} \quad (7.39)$$

where the  $\varepsilon$ 's are the static dielectric constants, and the  $n$ 's are the refractive indices in the visible range."

p. 545, line 6 from bottom: "*Dejaguin*" should be "*Derjaguin*"

p. 565, Table 7-3(b): in left column, " $D$ " should be " $d$ "

p. 566, line 12: "number of aggregates" should be "number of singlets plus aggregates"

p. 567, line 2 from bottom: "Eq.(7.117)" should be "Eq. (7.120)"

p. 570, line 4: "Eq. (7.127)" should be "Eq.(7.130)"

p. 573, Eq. (7.145) should be:  $\frac{1}{W_{\text{total}}} = \frac{x_1^2}{W_{11}} + \frac{x_1 x_2}{W_{12}} + \frac{x_2^2}{W_{22}}$ , and

Eq. (7.147) should be:  $W_{\text{total}} \approx \frac{W_{12}}{x_1 x_2}$

p. 591, line 7: " $S_0 \geq \delta$ " should be: " $\delta \leq S_0 \leq 2\delta$ "

p. 598, line 7 from bottom: "Eq. (7.179)" should be "Eq. (7.187)"

p. 600, line 9: "50-100 mm" should be "50-100  $\mu\text{m}$ "

p. 602, after Eq. (7.190): "w" should be " $\Delta w$ "

p. 603, Fig. 7-35: The horizontal axis should be labeled: "volume fraction,  $\phi$ "

## Chapter 8

p. 622, line 1: "cone-and-bob" should be "cup-and-bob"

p. 622, after Eq. (8.6): " $\mu$ " should be " $\mu_0$ "

p. 622, second line after Eq. (8.6): add "for spheres" after "2.5"

## Chapter 9

p. 643, lines 11-12: "order of 100 nm or less" should be "order of 5 - 50 nm or more"

p. 648, line 2 from bottom: " $n$ " should be " $N$ "

p. 650, in Eqs. (9.6) and (9.7), and line 16: " $n$ " should be " $N$ "

p. 653, Fig. 9-9: The images for (a) and (b) should be reversed, and the caption should read: (a) Stabilization of an O/W emulsion by a monovalent metal soap, and (b) stabilization of a W/O emulsion by a divalent metal soap.

p. 655, line 3: "1" should be "0"

p. 656, Table 9-2: Caption should read " $HLB = 7.0 + \Sigma(\text{Group Numbers})$ "

p. 662, Fig. 9-21: " $n/n_0$ " should be " $N/N_0$ "

p. 662, Fig. 9-21 caption, line 3: should read "acetone out of water drops into benzene"

p. 685, Eq. (9.26) should read:  $S = \sigma_A - \sigma_B - \sigma_{A/B} > 0$

p. 689, line following Eq. (9.29): "Eq. (9.28)" should be "Eq. (9.29)"

p. 689, second line following Eq. (9.29): "line" should be "lines" and Fig. 9.38(a)" should be "Fig. 9.40(a)"

## Chapter 10

p. 713, line 5 from bottom: " $\text{mN}/\text{cm}^\circ\text{K}$ " should be " $\text{mN}/\text{m}^\circ\text{K}$ "

p. 716, Eq. (10.61) should read: 
$$v_\infty = \frac{2\mu}{3(2\mu + 3\mu')} \left[ \frac{3a\mu}{(2 + k'/k)} \left( \frac{d\sigma}{dT} \right) \left( \frac{dT}{dz} \right) + a^2(\rho' - \rho)g(\mu + \mu') \right]$$

p. 722, Eq. (10.82): The first term on the lhs should be preceded by a "-"

## Appendix 1

p. 753. Prob. 1:  $T_b$  for benzene should be listed as 353.2K (not 259.0K)

p. 760, Prob. 4, last line: units of 61.7 should be:  $1/\text{ohm}\cdot\text{cm}^2\cdot\text{mol}$

p. 761, Prob. 5: replace " $\epsilon$ " with " $\epsilon\epsilon_0$ "

p. 763, line 2: after (CCC), insert: "for NaCl"

p. 763, Chapter 8, Prob. 1: "Moody" should be "Mooney"

p. 763, Prob. 3: insert "200-nm diameter" in front of "silica particles"

p. 764, Prob. 4, second line from bottom: "MPa" should be "kPa"