Deen, Analysis of Transport Phenomena

Errata for First and Second Printings

p. 40 In the energy equation for spherical coordinates in Table 2-2,

\[ \frac{1}{r^2} \frac{\partial}{\partial r} \left( r^2 \frac{\partial T}{\partial r} \right) \] not \[ \frac{1}{r^2} \frac{\partial}{\partial r} \left( r \frac{\partial T}{\partial r} \right) . \]

p. 43 In last line of text, "b = \rho \dot{H}" should read "b = \rho \dot{H} ."

p. 78 In Eq. (3.2-22), y should be Y.

p. 82 In Eq. (3.3-7), "Bi << 1" not "Bi >> 1."

p. 87 In Eq. (3.4-7), second equation, \( \partial C/\partial x \) not \( \partial C/\partial X \)."

p. 138 In Eq. (4.2-18), middle term of second line, change "\( \Theta_n \)" to "\( \Theta \)."

p. 162 In Eq. (4.5-73), \( \sin(n\pi y/b) \) should be \( \sin(m\pi y/b) \).

p. 163 In last line of Eq. (4.5-78), \( (n\pi)^2 \) should be \( (n\pi/a)^2 \).

p. 163 In Eq. (4.5-79), \( (m\pi)^2 \) should be \( (m\pi/b)^2 \).

p. 163 Eq. (4.5-81) should read

\[ \frac{d^2\Theta_{nm}}{dz^2} - \left( \frac{n}{a} \right)^2 + \left( \frac{m}{b} \right)^2 \pi^2 \Theta_{nm} = 0 \] .

p. 163 In Eq. (4.5-83), \( \Theta_n \) should be \( \Theta_{nm} \) (two places).

p. 164 Eq. (4.5-84) should read

\[ \Theta_{nm}(z) = \frac{2\sqrt{ab}}{nm\pi^2} \left\{ \sinh \left[ \left( \frac{(n/a)^2 + (m/b)^2}{\pi c} \right)^{1/2} z \right] \right\} \]

\[ \frac{1}{\sinh \left[ \left( \frac{(n/a)^2 + (m/b)^2}{\pi c} \right)^{1/2} z \right]} \]
p. 164 Eq. (4.5-85) should read

\[ \Theta(x,y,z) = \frac{16}{\pi^2} \sum_{n \text{ odd}}^{\infty} \sum_{m \text{ odd}}^{\infty} \frac{1}{nm} \sinh \left[ \frac{(n/a)^2 + (m/b)^2}{12} \right] \frac{\sin \left( \frac{n\pi x}{a} \right) \sin \left( \frac{m\pi y}{b} \right)}{\pi c} \]

p. 185 In Eq. (4.8-59), bold "\nabla." 

p. 222 In each equation of Table 5-1, the last term on the left-hand side should be of the form 

\[ v_z \frac{\partial v}{\partial z} \text{, not } v_z \frac{\partial v}{\partial t}. \] 

There are several other errors in the last equation, which should read

\[ \rho \left[ \frac{\partial v_z}{\partial t} + v_x \frac{\partial v_z}{\partial x} + v_y \frac{\partial v_z}{\partial y} + v_z \frac{\partial v_z}{\partial z} \right] = \rho g_z - \frac{\partial P}{\partial z} + \left[ \frac{\partial \tau_{xz}}{\partial x} + \frac{\partial \tau_{yz}}{\partial y} + \frac{\partial \tau_{zz}}{\partial z} \right]. \]

p. 227 In Table 5-5 the expression for \( \tau_{r\theta} \) should read

\[ \tau_{r\theta} = \tau_{\theta r} = \mu \left[ r \frac{\partial}{\partial r} \left( \frac{v_\theta}{r} \right) + \frac{1}{r} \frac{\partial v_r}{\partial \theta} \right]. \]

p. 236 In the text immediately above Eq. (5.7-11), change "Eq. (5.7-11)" to "Eq. (5.7-9)."

p. 237 Line 5, "Eq. (A.8-24)" not "Eq. (A.8-25)."

p. 242 Equation (5.9-13d) should be

\[ E^2 \psi = -(r \sin \theta) w_\phi. \]

p. 249 In the first line of Problem 5-2, part (b), delete "or axisymmetric." That is, the equation in part (b) is valid only for planar flows.

p. 250 In the equation in Problem 5-7(b), "\frac{dr}{dt}" not "\frac{dr}{dr}.

p. 276 Replace last period by hyphen in labels of Eqs. (6.6-35), (6.6-38), and (6.6-39).
p. 296 In Eq. (7.3-10), "\( \partial / \partial r \)" not "\( d/dr \)."

p. 301 Include a minus sign on the right-hand side of Eq. (7.4-18), such that

\[
v_\theta(\theta) = -\frac{U}{(\pi^2/4) - 1} \left[ \frac{\pi}{2} \left( \frac{\pi}{2} - \theta \right) \sin \theta - \theta \cos \theta \right].
\]

p. 338 Three lines above Eq. (8.2-20), "\( \partial \tilde{\rho} / \partial y \)" not "\( \partial \tilde{\rho} \partial y \)."

p. 338 One line below Eq. (8.2-20), "\( O(\delta^2) \)" not "\( O(\delta) \)."

p. 354 Line 11 of text: "Eq. (8.4-33)" not "Eq. (8.3-33)."

p. 360 Line 2, "Eq. (8.5-21)" not Eq. (8.5-22)."

p. 361 Eq. (8.5-28), first symbol in numerator should be "\( p \)" not "\( \rho \)."

p. 361 Three lines from bottom, add prime to last term in text equation, so that it reads

"\( (ff)'' = ff'' + (f')^2 \)."

p. 362 Two lines below Eq. (8.5-41), "Eq. (8.5-41)" not "Eq. (8.5-40)."

p. 365 Problem 8-4(d), line 2, “separation” not “stagnation.”

p. 368 The last differential equation in Problem 8-9(b) should read

\[
G'' - 2FG - HG' = 0.
\]

p. 427 Equation (10.4-12) should be

\[
\frac{1}{k_{NO}^{(G)}} = \frac{1}{k_{NO}^{(L)}} + \frac{K_{NO}}{k_{NO}^{(G)}}.
\]

The text immediately below the equation should read:

"where \( K_{NO} \) is the liquid-to-gas concentration ratio at equilibrium (0.047 at 23˚C).

Because the Péclet number is large..."
p. 427 The text below Eq. (10.4-15) should read:

"Together with the small value of $K_{NO}$, this indicates that the mass transfer resistance in the gas is negligible. Thus, the overall mass transfer coefficient essentially equals that in the liquid."

p. 486 In Eq. (12.3-3), $\eta \equiv y/H$ not $\eta \equiv y/W$.

p. 530 In the third line of Example 13.4-1, "(13.3-22)" not "(13.2-22)."

p. 535 Brackets are mismatched in Eq. (13.4-39): there should be a large square (not curved) bracket immediately to the left of the equals sign.

p. 546 The complete list of authors in the Sureshkumar reference is:

"Sureshkumar, R., R. A. Handler, and A. N. Beris."

p. 554 In Eq. (A.2-6), "$\tau - \tau' = ...$" not "$\tau = \tau' = ...$"

p. 565 In Eqs. (A.5-4) and (A.5-5), "$dS$" not "$ds$".

p. 566 In Eq. (A.5-10), "dV" should be in italics (two places).

p. 574 One line below Eq. (A.7-30c), "Eq. (A.7-30)" not "Eq. (A.6-30)."

p. 577 Change the last derivative in Eq. (2) of Table A-4, such that

$$\nabla \cdot \mathbf{v} = \frac{1}{r^2} \frac{\partial}{\partial r} (r^2 v_r) + \frac{1}{r \sin \theta} \frac{\partial}{\partial \theta} (v_\theta \sin \theta) + \frac{1}{r \sin \theta} \frac{\partial v_\phi}{\partial \phi}.$$ 

p. 578 Insert $e_z$ at the end of Eq. (A.8-5), so that it reads

$$\mathbf{B} = \frac{\partial \mathbf{r}}{\partial y} = (0)e_z + (1)e_y + \frac{\partial F}{\partial y} e_z.$$
Deen, Analysis of Transport Phenomena

Errata for Third Printing

p. 162 In Eq. (4.5-73), \( \sin(n \pi y/b) \) should be \( \sin(m \pi y/b) \).

p. 163 In last line of Eq. (4.5-78), \((n \pi)^2\) should be \((n \pi/a)^2\).

p. 163 In Eq. (4.5-79), \((m \pi)^2\) should be \((m \pi/b)^2\).

p. 163 Eq. (4.5-81) should read

\[
\frac{d^2 \Theta_{nm}}{dz^2} - \left[ (n/a)^2 + (m/b)^2 \right] \pi^2 \Theta_{nm} = 0.
\]

p. 164 Eq. (4.5-84) should read

\[
\Theta_{nm}(z) = \frac{2 \sqrt{ab}}{nm \pi^3} \left[ 1 - (-1)^n \right] \frac{\sinh \left\{ \left[ (n/a)^2 + (m/b)^2 \right]^{1/2} \pi z \right\}}{\sinh \left\{ \left[ (n/a)^2 + (m/b)^2 \right]^{3/2} \pi c \right\}}
\]

p. 164 Eq. (4.5-85) should read

\[
\Theta(x,y,z) = \frac{16}{\pi^2} \sum_{n=1}^{\infty} \sum_{m=1}^{\infty} \frac{1}{nm} \frac{\sinh \left\{ \left[ (n/a)^2 + (m/b)^2 \right]^{1/2} \pi c \right\}}{\sinh \left\{ \left[ (n/a)^2 + (m/b)^2 \right]^{3/2} \pi c \right\}} \sin \left( \frac{n \pi y}{a} \right) \sin \left( \frac{m \pi y}{b} \right)
\]

p. 250 In the equation in Problem 5-7(b), “d\(r\)/dt” not “d\(r\)/dr.”

p. 276 Replace last period by hyphen in labels of Eqs. (6.6-35), (6.6-38), and (6.6-39).

p. 338 Three lines above Eq. (8.2-20), “\( \partial \tilde{\rho} / \partial \tilde{y} \)” not “\( \partial \tilde{\rho} \partial \tilde{y} \).”

p. 338 One line below Eq. (8.2-20), “\( O(\tilde{\delta}^2) \)” not “\( O(\tilde{\delta}) \).”

p. 360 Line 2, “Eq. (8.5-21)” not Eq. (8.5-22).”

p. 361 Eq. (8.5-28), first symbol in numerator should be “\( p \)” not “\( \rho \).”
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“(ff)’ = ff’’ + (f ‘)2.”

p. 362 Two lines below Eq. (8.5-41), “Eq. (8.5-41)” not “Eq. (8.5-40).”

p. 365 Problem 8-4(d), line 2, “separation” not “stagnation.”

p. 530 In the third line of Example 13.4-1, “(13.3-22)” not “(13.2-22).”

p. 535 Brackets are mismatched in Eq. (13.4-39): there should be a large square (not curved) bracket immediately to the left of the equals sign.

p. 566 In Eq. (A.5-10), “dV” should be in italics (two places).

p. 574 One line below Eq. (A.7-30c), “Eq. (A.7-30)” not “Eq. (A.6-30).”

p. 578 The last term in Eq. (A.8-5) should read

\[ \frac{\partial F}{\partial y} \mathbf{e}_y \text{ not } \frac{\partial F}{\partial y} \mathbf{e}_y. \]