(Version: 11 Dec 2003)

Corrigenda for Transport Phenomena (2nd Edition, 3rd Printing)

(In designating line locations, "a" means "from above" and "b" means "from below")

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Page	Location	Reads	Should Read
12	Fn 2	Mathematica,	Mathematica (1687),

39	Eq 1C.2-1	In the 2nd and 3rd lines, where the product of three integrals appears, in the first integral the u^2 should be replaced by u_x^2, in the second integral the u^2 should be replaced by u_y^2, and in the third integral the u^2 should be replaced by u_z^2	
39	1C.3(a), line 1	**v**	**u**
53	Ex 2.3-2, line 3	can be regarded a	can be regarded as
65	Prob 2B.7, Ans to (b)	$(1-\kappa^2$	$\left(1-\kappa^2\right)$
65	Fig 2B.8	$h = 1.0''$	$H = 1.0''$
70	Fn 6	Add two more references: F. J. Eichstadt and G. W. Swift, *AIChE Journal*, **12**, 1179-1183 (1966); M. C. S. Chen, J. A. Lescarboura, *AIChE Journal*, **14**, 123-127 (1968)	
73	Prob 2C.7 (c) Soln	$\left(\mu VL / \pi D^4 \overline{p}\right)$	$\left(\mu VL / D^4 \overline{p}\right)$
73	Prob 2D.1	Should include the figure that appeared on p. 52 of *Dynamics of Polymeric Liquids*, 1st Edition.	
81	Eq 3.3-1	$-(\nabla \cdot (\boldsymbol{\tau} \cdot \mathbf{v}])$	$-(\nabla \cdot [\boldsymbol{\tau} \cdot \mathbf{v}])$
82	Fn 1	S. de Groot	S. R. de Groot
90	Fig 3.6-1(a)	The velocity profile is drawn incorrectly. It should be convex rather than concave.	
90	Fig 3.6-1 caption	θ_B	θ_b

91	1 line above Eq 3.6-30	B.2	B.1
94	Line 2a	Tables B.2 and B.6	Tables B.4 and B.6
97	Eq 3.7-6	$\breve{\nabla}^2 =$	$\breve{\nabla}^2 = l_0^2 \nabla^2 =$
98	Fn 5	surface tension in	surface tension is
102	Eq 3.7-31	$\breve{r} =$	$0 \le \breve{r} <$
102	Eq 3.7-32	$0 < \breve{r} <$	$0 \le \breve{r} <$
102	4 lines after Eq 3.7-36	$\partial \breve{v}_j / \partial \breve{x}_i)$	$(\partial \breve{v}_j / \partial \breve{x}_i)$
103	Eq 3.7-45	$\left(\breve{\breve{\mathscr{P}}}_0 - \breve{\breve{\mathscr{P}}}_L\right)$	$\left(\left\langle \breve{\breve{\mathscr{P}}}_0 \right\rangle - \left\langle \breve{\breve{\mathscr{P}}}_L \right\rangle\right)$
104	Prob 3A.4	Fig. 3.5-1	Fig. 3.6-1
115	Line above Eq 4.1-1	Table B.5	Table B.6
122	Line 20a	Table 4.1-1	Table 4.2-1
124	Above Eq 4.2-8	Eq. 4.2-4	Eq. 4.2-3
124	Line above Eq 4.2-13	$C_1 = -\frac{1}{4} v_\infty R^2$	$C_1 = -\frac{1}{4} v_\infty R^3$
124	Eq 4.2-2	A solution has been obtained to the unsteady analog of this equation by F. Sy, J. W. Taunton, and E. N. Lightfoot, *AIChE Journal*, **16**, 386-391 (1970).	

125	Line 2a	given in Table B.7	given in Table B.6
131	Fn 8	Compressible	Incompressible
141	Prob 4A.1	0.22 s	22 s
142	Prob 4B.2(a)	Eq. 4.4-1	Eq. 4.1-1
143	Eqs 4B.2-3 & 4	v_∞	v_0
143	Prob 4B.2(d)	v_∞	v_0
150	Prob 4C.4, Ans	$w = \dfrac{2\pi\kappa h(p_2 - p_1)\rho}{\mu \ln(R_2/R_1)}$	$w = \dfrac{2\pi\kappa h(\mathcal{P}_2 - \mathcal{P}_1)\rho}{\mu \ln(R_2/R_1)}$
151	Prob 4D.5(a)	Insert a sentence between the first and second sentences: “The second function also describes unsteady incompressible flows.”	
151	Prob 4D.5(b)	Include a minus sign after the equals sign. Replace the second sentence by: “Here h_3 and $\boldsymbol{\delta}_3$ are the scale factor and unit vector for the velocity component not shown in the table.”	
151	Prob 4D.5(d)	(Eq. A.5-4)	(Eq. A.5-4) and the definition of **A** from (a),
151	Fn 10	227-228	227-238
164	Ex 5.4-1	The reasoning given here seems to be similar to that of D. T. Wasan, C. L. Tien, and C. R. Wilke, *AIChE Journal*, **9**, 567-569 (1963).	
167	Ex 5.5-3, line 3b	1.02×10^{-7}	1.02×10^{-6}
168	Eq 5.5-9	485	477

	Eq 5.5-10	0.0052	0.00524
	Eq 5.5-11	0.0052	0.00524
	Eq 5.5-11	95	94
185	Eq 6.3-1	$-\mathcal{P}$	$-(p+\rho g z-p_0)$
185	Eq 6.3-5	$-\breve{\mathcal{P}}$	$-(\breve{\mathcal{P}}-\breve{\mathcal{P}}_0)$
185	Eq 6.3-7	$\breve{\mathcal{P}}=\dfrac{\mathcal{P}}{\rho v_\infty^2}$	$\breve{\mathcal{P}}=\dfrac{(p+\rho g z)-(p_0+\rho g 0)}{\rho v_\infty^2}=\dfrac{\breve{\mathcal{P}}-\breve{\mathcal{P}}_0}{\rho v_\infty^2}$
193	Prob 6A.3	68 gal/min	4.1×10^3 gal/hr
194	Prob 6A.8	$1.7\times10^4\,\mathrm{lb}_f$	$1.7\times10^4\,\mathrm{lb}_f$ $=5.4\times10^5$ poundals
195	Prob 6C.1 ans	Fig. 5.3-1	Fig. 6.3-1
208	Eq 7.5-16	2740 + 85 – 8	2740 + 85 + 8
212	Ex 7.6-3(b)	Eq. (d) of Table 7.6-1	Eq. (D) of Table 7.6-1
216	Line after Eq 7.6-45	volume rate of flow	mass rate of flow
218	Line 2b	with $\phi(N)=1$.	with $\phi(N)=1$).
239	Fig 8.2-4	sinsoidal motion	sinusoidal motion
239	Fig 8.2-4 caption	by 39.27.	by 39.27).
248	1 line after Eq 8.4-19	8.4-19	8.4-18

252	Line 1a	Eqs. 8.5-7	Eq. 8.5-7
278	Eq 9.3-19	1074	1.074
278	Eq 9.3-19	2.065×10^{-5}	2.065×10^{-4}
287	Prob 9A.5	megabar	bar (three times!)
287	Prob 9A.6(b)	given in Table 9.1-4	given in Table 9.1-5
306	Fig 10.6-2	k^{01}, k^{12}, k^{23}	k_{01}, k_{12}, k_{23}
307	Fig 10.7-1	The direction of the *y*-axis should be reversed (in order to avoid having a left-handed coordinate system)	
330	Line 14a	Note that Eq. 10C.5	Note that Eq. 10C.1-5
338	Fn 1, line 4	$(\partial p/\partial T)_p$	$(\partial p/\partial T)_\rho$
352	Line 1b	plot of Eq. 11.4-85	plot of Eq. 11.4-75
354	Eq 11.5-2	$+\bar{\rho}\mathbf{g}\bar{\beta}(T-\bar{T})$	$-\bar{\rho}\mathbf{g}\bar{\beta}(T-\bar{T})$
354	Eq 11.5-8	$(\breve{T}-\breve{T})$	$(\breve{T}-\breve{\bar{T}})$
354	Eq 11.5-9	Φ_v	$\breve{\Phi}_v$
362	Prob 11A.5, Soln (c)	$\Delta\hat{K} - 86.9\,\text{Btu}/\text{lb}_m$	$\Delta\hat{K} = -86.9\,\text{Btu}/\text{lb}_m$
368	Eq 11B.15-1	$\phi_y \dfrac{\partial \phi_y}{\partial \eta}$	$\phi_y \dfrac{\partial \phi_z}{\partial \eta}$
374	Line 7a	one dependent	one independent

396	Line 3a, Eq no.	12A.4-1	12A.5-1
400	Prob 12B.9	given in Eq. 12.2-2	given in Eq. 12.2-24
404	Eq 12D.2-4	$\int_0^1 X_i^2 \xi d\xi$	$\int_0^1 X_i^2 \phi\xi d\xi$
404	2 lines before Eq 12D.2-5	Wenzel	Wentzel
404	Add to fn 10	For an alternate solution to Eq. 12D.2-3, see C.-R. Huang, M. Matlosz, W.-D. Pan, and W. Snyder, Jr., *AIChE Journal*, **30**, 833-834 (1984).	
408	Eq 13.1-8	T	$\overline{T}$ (cap tee with overbar)
421	Prob 13D.1(b)	$C_2 = \frac{7}{24}$	$C_2 = -\frac{7}{24}$
421	Prob 13D.1(b)	fluid.	fluid in laminar developed flow.
429	Fig 14.2-1	The "10" on the abscissa should be 10^0	
435	Fn 3	Alan	Allan
436	Fig 14.3-2, 3rd entry of ordinate	subscript "in"	subscript "ln"
445	Eq. 14.6-12	$\mathrm{Nu}_m^{\mathrm{free}})^3$	$(\mathrm{Nu}_m^{\mathrm{free}})^3$
445	Fn 6	(1987) E.	(1987); E.
449	2 lines after Eq 14.7-11	$T_d = 220$	$T_d = 220°\mathrm{F}$
458	Table 15.3-1 fn e	Eqs. 7.3-3 and 4	Eqs. 7.4-3 and 4

461	Line 2b	Then using Eq. 7.5-9	Then using Eq. 7.5-8
464	Line 5b	100 psi and 70 F	100 psia and 70 F
464	Line 4b	(200 ft)(40 ft/s)(2.61 ft^2/s)	(2 ft)(40 ft/s)(2.61 $\times 10^{-5}$ ft^2/s)
466	Table 15.5-1 fn d	Eqs. 7.3-3 and 4	Eqs. 7.4-3 and 4
468	Line 4b	in the exit steam	in the exit stream
470	Eq 15.5-23	b/UA	$B = b/UA$
492	3 lines before Eq 16.2-11	R K	R^4 K^4
494	1 line after Eq 16.3-9	K	K^4
499	2 lines after Eq 16.4-11	that its directly	that is directly
502	Eq 16.5-7	$A_i\left(\sigma T_i^4 - J_i\right)$	$\left(\sigma T_i^4 - J_i\right)$
504	Line 2b	Then Eq. 16.15-3	Then Eq. 16.5-3
505	Line 2a	540 R	540°R
505	Line 3a	Eq. 16.5-12	Eq. 16.5-16
505	Line 6a	Example 14.5-1	Example 14.6-1
505	Eq 16.5-17	= 32 Btu/hr	= 33 Btu/hr
505	Eq. 16.5-18	21 + 32 = 53 Btu/hr	16 + 33 = 49 Btu/hr

505	Eq 16.5-19	$(402)^4$	$(492)^4$
505	Ex 16.5-3	Add at very end of the example: "For more realistic treatments, see Problem 22B.4 and Example 19.5-2."	
509	Prob 16C.1	16.1-1	16C.1-1
524	Line 2a	Equation 17.4-2	Equation 17.2-2
525	4 lines after Eq 17.3-4	finite velocity mass	finite mass
528	Ex 17.3-1	100 K	110 K
533	Line 4a	in flowing dilute	in dilute
540	Prob 17A.9	Eq. 17.2-13 gives	Eq. 17.3-11 gives
540	1 line after Eq 17A.9-1	= 1.225	about 1.225
544	Line 5b	18.4 we given some	18.4 we give some
546	One line above Eq 18.2-1	Eq. 17.0-1	Eq. 18.0-1
551	Line 12b	Fig. 18.3-1b	Fig. 18.3-1b. (add period)
553	Eq 18.3-14	(k_1 large)	(k_1'' large)
556	Eq 18.4-15	$(B - \cosh\phi \sinh\phi\zeta)$	$(B - \cosh\phi)\sinh\phi\zeta$
558	Fig 18.5-1	$v(x)$	$v_z(x)$
573	Prob 18B.9 title	**leachng**	**leaching**

577	Prob 18B.14	where z and b are	where c_{As} is the surface concentration at $z = \pm b$, and z and b are
578	Prob 18B.15(b)	is zero	is approximately zero
586	Line 2a	Eq. C.7	Eq. C.1-7
590	Eq 19.3-5	$\rho \hat{H}_{\alpha} \mathbf{v}$	$\rho \hat{H} \mathbf{v}$
601	Line 9b	Tables 9.1-1 and	Tables 9.1-2 and
601	Line 8b	wide range	wider range
602	1 line above "SOLUTION"	wet air become	wet air becomes
608	Fn 2	Add: see also O. T. Hanna, *AIChE Journal*, **8**, 278-279 (1962)	
610	Eq 19D.3-4	$(Y_{AA} + Y_{BB})^2$	$(Y_{AA} - Y_{BB})^2$
615	Fn 1	Add to footnote: See also V.-D. Dang and W. N. Gill, *AIChE Journal*, **16**, 793-802 (1970).	
622	1 line above Eq 20.1-72	interfacial mass flux	interfacial molar flux
633	Ref 7	pp. 22-63	pp. 23-63
658	Line 2b	$\bar{\mathbf{J}}_A^{(v)} = -\mathfrak{D}_{AB} \bar{c}_A$	$\bar{\mathbf{J}}_A^{(v)} = -\mathfrak{D}_{AB} \nabla \bar{c}_A$
668	Line 3a	Eq. 18C.1-2	Eq. 18C.1-3
669	Prob 21B.3	in Problem 21A.2	in Problem 21B.1

676	Table 22.2-1, "Flux" row	$\mathbf{J}_A{}^* = \mathbf{N}_A + x_A(\mathbf{N}_A + \mathbf{N}_B)$ $\mathbf{j}_A{}^* = \mathbf{n}_A + \omega_A(\mathbf{n}_A + \mathbf{n}_B)$	$\mathbf{J}_A{}^* = \mathbf{N}_A - x_A(\mathbf{N}_A + \mathbf{N}_B)$ $\mathbf{j}_A{}^* = \mathbf{n}_A - \omega_A(\mathbf{n}_A + \mathbf{n}_B)$
681	Eqs 22.3-14&15	$\breve{r}, \theta, \breve{z}, \mathrm{Re}, \ldots$	$\breve{r}, \theta, \breve{z}; \mathrm{Re}, \ldots$
683	Line 6a	(from Table 1.1-1)	(from Table 1.1-2)
684	Eq 22.3-32	$W_{A0}(\overline{H}_{A1} - \overline{H}_{A0})$	$W_{A0}(\overline{H}_{A0} - \overline{H}_{A1})$
684	2 lines after Eq 22.3-32	$\overline{H}_{A1} - \overline{H}_{A0}$	$\overline{H}_{A0} - \overline{H}_{A1}$
685	Line 10a	above A commonly	above. A commonly
685	5 lines below Eq 22.3-42	result in Eq. 22.3-43	result in Eq. 22.3-42
690	1 line below Eq 22.4-11	22.3-9	22.4-9
693	Line 3 in figure caption	of a solute from a	of a
693	5 lines below Eq 22.4-40	Eqs. 12.4-12 and 13	Eqs. 22.4-12 and 13
698	1 line above Eq 22.6-1	Eq. 11.4-11	Eq. 11.4-51
699	1 line above Eq 22.6-9	Eqs. 22.67 and 68	Eqs. 22.6-7 and 8
714	Fn 6	Physical Chemistry	*Physical Chemistry*
730	Eq 23.1-17	$X = \frac{y}{1-y}$	$Y = \frac{y}{1-y}$

733	Eq 23.1-37	This equation has also been obtained by J. B. Opfell, *AIChE Journal*, **24**, 726-728 (1978), using thermodynamic arguments and *assuming* ideal mixtures.	
734	Eqs 23.1-46, 48, and 49	Negative signs should be inserted before the arguments of all six exponentials	
734	Eq 23.1.48	+(0.0062	+0.00621
735	Eq 23.1-50	t (twice)	t' (twice)
735	Eq 23.1-57	$\dfrac{d\rho_2'}{dt}$	$\dfrac{d\rho_2'}{dt'}$
740	Fn (d)	Eqs. 7.3-3 and 4	Eqs. 7.4-3 and 4
742	Line 12b	Eq. 22.2-14 can be	Eq. 21.1-14 can
746	l line after Eq 23.5-29	all of quantities	all of the quantities
746	1 line before Eq 23.5-32	23.5-3	23.5-30
746	Eq 23.5-32	$y_2 - y_P$	$y_3 - y_P$
748	Eq 23.5-40	$y_{n-1}U$	$y_{n+1}U$
749	1 line before Eq 23.5-47	in Fig. 15.5-9.	in Fig. 15.5-6.
756	Fn 4	**36**	**37**
760	Prob 23B.2(b)	Eq. 23.5-41	Eq. 23.5-60
760	Prob 23B.2(c)	Eq. 23.5-29	Eq. 23.5-48

761	Line 2a	containing 1.0 mole	containing 10 mole
761	Line 3a	waste of 10%	waste of 1%
794	Eq 24.6-3	$\langle N_A \rangle = D_{AK}^{\text{eff}} \dfrac{dc_A}{dz}$	$\langle N_A \rangle = -D_{AK}^{\text{eff}} \dfrac{dc_A}{dz}$
796	Eq 24.6-13	$\psi_{H1} = \frac{1}{2}\left(1 - e^{-7.48\tau}\right)$	$\psi_{H1} = \frac{1}{2}\left(1 + e^{-7.48\tau}\right)$
796	8 lines below Eq 24.6-13	various tests gases	various test gases
796	Line 3b	wall. Result to	wall. Results to
798	Eq 24.6-19	$+(N_A + N_B)$	$+x_A(N_A + N_B)$
801	Prob 24C.2	2.32×10^{-15}	2.32×10^{-13}
805	Line 6a	concentration profile	concentration profiles
819		Equation numbers (A.3-29) and (A.3-30) should be right justified	
824	Line 2a	$\dfrac{\partial}{\partial \mathbf{t}}$	$\dfrac{\partial}{\partial t}$ (*t* is lightface italic)
824	Line 2a	ρg	$\rho \mathbf{g}$ (**g** is boldface Roman)
826	Eqs A.6-4,5,6	These equations and their equation numbers should be shifted to the right, with the equation numbers right-justified	
831	Line 2b	but is *is* straight-	but it *is* straight-
839	Eqs A.7-36,37	These equation numbers should be right-justified	

840	Eq A.8-4	$rdrdz$	$drdz$
841	Eq A.8-7	$\sin\theta_0 r^2 drd\phi$	$\sin\theta_0 rdrd\phi$
841	Eq A.8-8	$r^2 dr \sin\theta d\theta$	$rdrd\theta$
859	Eq D.2-5	$=\frac{3}{2}n\kappa T$	This should be omitted, since this expression is valid only at equilibrium; in fluid dynamics it is common practice, however, to use the local equilibrium value which is $\frac{3}{2}n\kappa T$. See (ii) on p. 334.
859	Eq D.2-4	$\sum_\alpha$ should be inserted just before the integral sign.	
860	Eq. D.4-1	$\dot{\mathbf{r}}$	$\dot{\mathbf{r}}_\alpha$
860	1 line above Eq D.4-2	gradients,	gradients (compare with Eq. 24.1-6 on p. 766),
876	Dim'less groups	Ha … (20.1-41) Sh … (22.1-5)	Ha … (22.5-8) Sh … (22.1-15)
877		Abraham, E. F.	Abraham, F. F.
877	Batchelor, G. K.	106	108
895	Middle column	Wenzel-Kramers-	Wentzel-Kramers-
Back Cover		The labels on the axes should be interchanged.	