

## Errata and Commentary on *Radioanalytical Chemistry* (Bernd Kahn, ed.)

**Note:** The following errata and suggestions are submitted are written by Brett Palmer, and are not to be construed as any official position of the Office of Nonproliferation Research and Development (NA-22).

### Chapter 1

(No errata.)

### Chapter 2

Page	Line	Original	Corrected	Comments
10	4	kiloelectron volts	kiloelectronvolts	Should be all one word.
10	8	electron volts	electronvolts	Should be all one word.
10	23	“m”	“ <i>m</i> ”	Italics.
10	23	<sup>238m</sup> U	<sup>238<i>m</i></sup> U	Italics.
10	25	kiloelectron volts	kiloelectronvolts	Modern convention.
12	Eq. (2.4)	$\frac{dN}{dt}$	$\frac{dN}{dt}$	The differential <i>d</i> should be italicized.
12	Eq. (2.6)	$\frac{dN}{dt}$	$\frac{dN}{dt}$	The differential <i>d</i> should be italicized.
13	15	per mol	per mole	“Mole” should not be abbreviated
14	Eq. (2.8)	$\frac{dN}{dt}$	$\frac{dN}{dt}$	The differential <i>d</i> should be italicized (three instances).
15	12	million electron volts	million electronvolts –or– megaelectronvolts	Modern convention.
15	19	million electron volts	million electronvolts –or– megaelectronvolts	Modern convention.
15	22	million electron volts	million electronvolts –or– megaelectronvolts	Modern convention.
15	25	million electron volts	million electronvolts –or– megaelectronvolts	Modern convention.
16	Eq. (2.10a)	$P = N\Phi\sigma$	$P = N\Phi\sigma$	Capital Greek letters are not italicized.
16	14	$\Phi$	$\Phi$	Capital Greek letters are not italicized.
16	Eq. (2.11)	$\frac{dN}{dt}$	$\frac{dN}{dt}$	The differential <i>d</i> should be italicized.
17	6	14.8 MeV	14.1 MeV	14.06 MeV fusion reaction energy is imparted to the neutron.
19	Eq. (2.13)	$\mathfrak{R} = k(E_\alpha)^a$	$\mathfrak{R} = k(E_\alpha)^a$	Delete extraneous space.

## Chapter 2 (continued)

Page	Line	Original	Corrected	Comments
19	Eq. (2.14)	$\Re = 0.31(E_\alpha)^{3/2}$	$\Re = 0.31(E_\alpha)^{3/2}$	Delete extraneous space.
20	Fig. 2.3	Air: $d = 1.29 \text{ g/cm}^3$	Air: $d = 1.29 \text{ mg/cm}^3$	Typographical error.
20	2	(2.13)	(2.14)	Wrong equation referenced.
20	2	3.47	3.47 cm	Measurement unit missing.
21	Eq. (2.14)	$\Re = 412(E_\beta)^n$	$\Re = 412(E_\beta)^n$ , resequence to (2.15)	Delete extraneous space. There are two instances of Eq. (2.14).
23	Eq. (2.15)		Resequence to (2.16) (here and in all references in the book)	Consistency of sequence.
24	Eq. (2.15a)		Resequence to (2.17) (here and in all references in the book)	Consistency of sequence.
24	Eq. (2.16)		Resequence to (2.18) (here and in all references in the book)	Consistency of sequence.
25	Table 2.2	$\text{cm}^2 \text{g}^{-1}$	$\text{cm}^2 \text{g}^{-1}$ (two instances)	Add space between units.
25	14	(2.15)	(2.16)	Equation resequencing (see above).
25	15	(2.15a)	(2.17)	Equation resequencing (see above).
26	Figure 2.8 caption	p. 716	p. 717	Incorrect page referenced.
26	2	(2.15)	(2.16)	Equation resequencing (see above).
27	Figure 2.9 caption	p. 717	p. 716	Incorrect page referenced.
27	3	(2.17)	(2.19)	Equation resequencing (see below).
27	Eq. (2.17)		Resequence to (2.19) (here and in all references in the book)	Consistency of sequence.
28	9	$mc^2$	<i>mc</i> <sup>2</sup>	Italics.
30	14	(see Section 8.5.1)	(see Section 8.3.1)	Typographical error.
31	7	(see Section 8.5.1)	(see Section 8.3.1)	Typographical error.
35	Eq. (2.18)		Resequence to (2.20) (here and in all references in the book)	Consistency of sequence.

## Chapter 2 (continued)

Page	Line	Original	Corrected	Comments
36	Eq. (2.19)		Resequence to (2.21) (here and in all references in the book)	Consistency of sequence.
36	10	(2.19)	(2.21)	Equation resequencing (see above).

## Chapter 3

Page	Line	Original	Corrected	Comments
40	17	(see Section 6.7)	(see Section 6.5)	Typographical error.
41	3	$b^+$	$+b$	Suggested format.
41	4	$a^-$	$-a$	Suggested format.
41	22	designatethe	designate the	Typographical error.
41	Eq. (3.4)	$(B^{a-})^b = \frac{K_{sp}}{(A^{b+})^a} = \frac{K_{sp}}{[(A^{b+})_0 - (a/b)(B^{a-})_0 + (a/b)(B^{a-})]^a}$	$(B^{a-})^b = \frac{K_{sp}}{(A^{b+})^a} = \frac{K_{sp}}{[(A^{b+})_0 - (b/a)(B^{a-})_0 + (b/a)(B^{a-})]^a}$	All $a/b$ factors should be $b/a$ . See Appendix A.
41	Eq. (3.5)	$\frac{(B^{a-})^b}{(B^{a-})_0^b} = \frac{K_{sp}}{(B^{a-})_0^b [(A^{b+})_0 - (a/b)(B^{a-})_0 + (a/b)(B^{a-})]^a}$	$\frac{(B^{a-})^b}{(B^{a-})_0^b} = \frac{K_{sp}}{(B^{a-})_0^b [(A^{b+})_0 - (b/a)(B^{a-})_0 + (b/a)(B^{a-})]^a}$	All $a/b$ factors should be $b/a$ . See Appendix A.
43	Table 3.1, Nitrate Carrier example	Barium nitrate	Barium nitrate	Typographical error.
46	25	$(\text{NH}_4)\text{PO}_4 \cdot 12\text{MoO}_3 \cdot 3\text{H}_2\text{O}$	$(\text{NH}_4)\text{PO}_4 \cdot 12\text{MoO}_3 \cdot 3\text{H}_2\text{O}$	Format of “dots”.
46	25	$\text{Zr}(\text{HPO}_4)_2 \cdot \text{H}_2\text{O}$	$\text{Zr}(\text{HPO}_4)_2 \cdot \text{H}_2\text{O}$	Format of “dots”.
46	26	$\text{ZrO}_2 \cdot \text{P}_2\text{O}_5$	$\text{ZrO}_2 \cdot \text{P}_2\text{O}_5$	Format of “dots”.
47	Table 3.3 weakly acid tertiary amine group	$[\text{RN}(\text{CH}_3)_3]^+\text{Cl}^-$	$[\text{RNH}(\text{CH}_3)_2]^+\text{Cl}^-$	Errata submitted by chapter author (Bernd Kahn).
47	Table 3.3 weakly acid secondary amine group	$[\text{RNH}(\text{CH}_3)_2]^+\text{Cl}^-$	$[\text{RNH}_2\text{CH}_3]^+\text{Cl}^-$	Errata submitted by chapter author (Bernd Kahn).

### Chapter 3 (continued)

Page	Line	Original	Corrected	Comments
47	5	meq	mEq	The modern abbreviation for equivalent is “Eq”.
48	29	ethylene dinitrilotetraacetic acid	ethylenediaminetetraacetic acid	Suggest use of the more modern name of EDTA.
49	Figure 3.1	$D_V$	$D_V$	Format of variable.
50	7	E	$E$	Format of variable.
51	29	vs.	vs.	Modern convention.
52	41	triphenyphosphine	triphenylphosphine	Modern convention.
54	35	3 M	3M	Typographical error.
61	Eq. (3.18)	$E^\circ$	$E^\circ$	Superscript should be small circle, not an ‘o’.
61	20	$E^\circ$	$E^\circ$	Superscript should be small circle, not an ‘o’.
61	33	$E^\circ$	$E^\circ$	Superscript should be small circle, not an ‘o’.
61	Eq. (3.20)	$E^\circ$	$E^\circ$	Superscript should be small circle, not an ‘o’.
62	8	$E^\circ$	$E^\circ$	Superscript should be small circle, not an ‘o’.
62	10	$E^\circ$	$E^\circ$	Superscript should be small circle, not an ‘o’.
62	14	$E^\circ$	$E^\circ$	Superscript should be small circle, not an ‘o’.
62	14	cathode–uniformly	cathode—uniformly	Should be em dash.
62	17	$E^\circ$	$E^\circ$	Superscript should be small circle, not an ‘o’.

### Chapter 4

Page	Line	Original	Corrected	Comments
64	9	13.1	13.2	Typographical error.
66	20	kiloelectron volts	kiloelectronvolts	Modern notation.
66	26	it is dissipated...	is dissipated...	Typographical error. Delete “it”.
67	28	3.1	3.2.1	Typographical error.
70	Table 4.1, last line	W.	W	Delete period.
71	Table 4.2, line 9	320—380	320–380	En dash.

### Chapter 4 (continued)

Page	Line	Original	Corrected	Comments
72	Eq. (4.4)	$m_i = m_{\text{Ri}} \left( \frac{S_i}{S_f - 1} \right)$	$m_i = m_{\text{Ri}} \left( \frac{S_i}{S_f} - 1 \right)$	Typographical error in denominator. See Appendix B.
75	42	(3.20)		Typographical error.
76	6	<sup>110m</sup> Ag		Italics.
76	13	E <sup>o</sup>		Superscript should be small circle, not an 'o'.

### Chapter 5

Page	Line	Original	Corrected	Comments
77	8	11.1	11.2	Typographical error.
78	11	13.1	13.2	Typographical error.
84	16	et al.1977	et al. 1977	Typographical error.

### Chapter 6

Page	Line	Original	Corrected	Comments
94	21	1day	1 day	Typographical error.
95	36	1/2	half	Grammatical convention.
96	6	HNO <sub>3</sub> ,and	HNO <sub>3</sub> , and	Typographical error.
97	4–6	The sorbent with the remaining organical-bound tritium is mixed with a Hopcalite catalyst and heated to 550°C to oxidize organic gases to water, which is distilled and condensed (Ostlund and Mason 1985).	The sorbent with the remaining organic-bound tritium is mixed with a Hopcalite catalyst and heated to 550°C to oxidize organic gases to carbon dioxide and water, the latter of which is distilled and condensed (Ostlund and Mason 1985).	Suggested alternative wording. Organic gases are oxidized to water and CO <sub>2</sub> . Also recommend the use of the more common 'organic' over 'organical'.
97	19	(85%)	(83%)	Khazov Yu., et al., "Nuclear Data Sheets for A = 131", <i>Nuclear Data Sheets</i> 107, 2715–2930 (2006) publish a value of 83.4% for the 364 keV gamma ray of <sup>131</sup> I.
100	29	ethylene dinitrilotetraacetic acid	ethylenediaminetetraacetic acid	Suggest use of the more modern name of EDTA.

### Chapter 6 (continued)

Page	Line	Original	Corrected	Comments
111	Table 6.2, percent, $^{236}\text{U}$	76	74	M. R. Schmorak, 'Nuclear data sheets for A = 232, 236', <i>Nuclear Data Sheets</i> 63, 139–182 (1991) publishes this branching ratio as $73.8 \pm 0.4\%$ .
115	3	2.2	2.1	Typographical error.
115	29	(radioisotope/stable isotope ratio)	(radioactivity/mass of element)	As written, this only applies to cases where the radioisotope comprises a vanishingly small part of the mass, and all the remaining mass is stable and monoisotopic.
115	40	their	its	Typographical error.
116	8	subtraced	subtracted	Typographical error.
116	8	$R_1$	$R_1$	Italicize variable.
116	8	$R_2$	$R_2$	Italicize variable.
116	11	fraction $D_{90\text{Y}}$	Fraction $D_{90\text{Y}}$	Typographical error.
116	14	almost 1.0	almost unity	A value of 1.0 suggests an approximate value.
116	19	$D_{190\text{Y}}$	$D_{190\text{Y}}$	"Y" should not be italicized.
116	23	almost 1.0	almost unity	A value of 1.0 suggests an approximate value.
117	27	$\text{NaZn}(\text{UO}_2)_3(\text{C}_2\text{H}_3\text{O}_2) \cdot 6\text{H}_2\text{O}$	$\text{NaZn}(\text{UO}_2)_3(\text{C}_2\text{H}_3\text{O}_2) \cdot 6\text{H}_2\text{O}$	The dot preceding the waters of hydration should be raised.
119	30	or	and/or	Suggested change.

### Chapter 7

Page	Line	Original	Corrected	Comments
121	22	large	high	Suggested change.
122	29	4.5	4.7	Typographical error.
123	10	vs.	Vs.	Modern convention.
123	19	1 mg/cm <sup>2</sup> will	1 mg/cm <sup>2</sup> will	Typographical error.
123	21	10 mg/cm <sup>2</sup> will	10 mg/cm <sup>2</sup> will	Typographical error.
123	25	10-mg/cm <sup>2</sup> source	10-mg/cm <sup>2</sup> source	Typographical error.
125	18	2006	2008	The completion date of this dissertation is 2008.
131	14	volts and amperes	voltages and currents	Suggested change.

## Chapter 8

Page	Line	Original	Corrected	Comments
136	Table 8.1	(Corrupted)	(See Appendix C.)	Appendix C is a facsimile of the original table provided by the chapter author (John M. Keller).
138	12	Eq. (2.12)	Eq. (2.17)	Typographical error. Note that Eq. (2.17) is actually Eq. (2.15a) in the first printing, but is to be resequenced in subsequent printings (see errata for p. 25).
139	2	Eq. (2.12)	Eq. (2.17)	Typographical error. Note that Eq. (2.17) is actually Eq. (2.15a) in the first printing, but is to be resequenced in subsequent printings (see errata for p. 25).
140	29	0.5 $\mu$ s	0.5 ms <i>–or–</i> 500 $\mu$ s	Typographical error. Geiger-Müller detectors have notoriously long dead times.
142	12	data bases	Databases	Modern convention.
142	13	<a href="http://www.nndc.bnl.gov/index.jsp">http://www.nndc.bnl.gov/ index.jsp</a>	<a href="http://www.nndc.bnl.gov/index.jsp">http://www.nndc.bnl.gov/index.jsp</a>	Typographical error (delete space before “index”).
142	21	almost 1.0	Almost unity	A value of 1.0 suggests an approximate value.
142	29	(8.2)	(8.3)	Typographical error.
144	Figure 8.2 caption	HpGE	HPGE	Typographical error.
147	26	2.4.1	2.5.1	Typographical error.
150	2	vs.	vs.	Modern convention.
150	3	2.4.1	2.5.1	Typographical error.
150	12	$\alpha + \beta$	<i><math>\alpha + \beta</math></i>	Italicize lower-case Greek letters.
151	Table 8.5 caption	b-particle counting	$\beta$ -particle counting	Typographical error.
153	9	2.4.2	2.5.3	Typographical error.
157	9	worse	Poorer	Suggested change.
158	27	2.4.3	2.5.3	Typographical error.

## Chapter 8 (continued)

Page	Line	Original	Corrected	Comments
160	7	worse	poorer	Suggested change.
162	17	$a$ (in Bq)	$a$ (in Bq)	Typographical error.
162	Eq. (8.9)	$I = \frac{(4.7 \times 10^{-15}) f E a \mu_a}{4 \pi \rho x^2}$	$I = \frac{(4.7 \times 10^{-15}) f E a \mu_a}{4 \pi \rho x^2}$	Typographical error (space between $\rho$ and $x^2$ in denominator)
162	22	coulomb/kg <sup>-</sup>	coulomb/kg	Typographical error.

## Chapter 9

Page	Line	Original	Corrected	Comments
165	Eq. (9.1)	$t_{1/2} = 0.693(t_2 - t_1) / \ln C_1 / C_2$		Suggest recasting the equation. The equation is correct, but the typeset is confusing.
			$t_{1/2} = \frac{0.693(t_2 - t_1)}{\ln(C_1 / C_2)}$ <i>–or the more exact–</i> $t_{1/2} = \frac{(t_2 - t_1) \ln 2}{\ln(C_1 / C_2)}$	
165	18	2.1	2.2	Typographical error.
165	30	increase	increases	Typographical error.
166	23	increase	increases	Typographical error.
167	21	Lower- energy	Lower-energy	Typographical error.
167	22	Mueler	Mueller <i>–or–</i> Müller	Typographical error.
167	24	vs.	vs.	Modern convention.
167	36	kiloelectron volts	kiloelectronvolts	Modern convention.
167	40	kiloelectron volts	kiloelectronvolts	Modern convention.
168	43	Xenon	xenon	Typographical error.
168	45	kiloelectron volts	kiloelectronvolts	Modern convention.
172	Figure 9.3	${}^{89}_{39}\text{Sr}$	${}^{89}_{38}\text{Sr}$	Typographical error ( $Z = 38$ ).
173	Figure 9.5	94.4%	94.4%	Typographical error (9 is italicized).
175	19	log ft	log <i>ft</i>	Typographical error. The variable product <i>ft</i> should be italicized.
176	15	2.1	2.2	Typographical error.
176	25	2.1	2.2	Typographical error.
176	32	2.1	2.2	Typographical error.
176	38	2.2.4	2.2.5	Typographical error.
176	44	become equal	become essentially equal	Suggested change.



### Chapter 9 (continued)

Page	Line	Original	Corrected	Comments
178	21	28.8-years	28.8-year	Typographical error.
179	5-6	followed by 1760-keV gamma rays	followed by a 1760-keV gamma ray	Typographical error.
179	9	$^{137}\text{Cs}/^{137m}\text{Ba}$	$^{137}\text{Cs}/^{137m}\text{Ba}$	Typographical error (the <i>m</i> should be italicized).
181	32	3222 keV	33.2 keV	ENDF/B-VII Radioactive Decay File publishes this line as $33.196 \pm 0.001$ keV of intensity $0.126 \pm 0.003\%$ .
181	40	14.35-years	14.35-year half-life	Suggested change.

### Chapter 10

Page	Line	Original	Corrected	Comments
190	14	(8.2)	(8.3)	Typographical error.
191	20	round off	round-off	Typographical error.
192	20	GUMs	GUM's	Typographical error.
204	5	is, by default	is a selected constant	Typographical error.
208	28	8.2.2	8.2.1	Typographical error.
210	14	A	A3	Typographical error.
211	2	analogously	analogous	Suggested change.
211	24	Arepresents	A represents	Typographical error.
215	36	anthropomorphic	anthropogenic	Typographical error.
218	Figure 10.5	(pCi L <sup>-1</sup> )	(pCi L <sup>-1</sup> )	Typographical error. The symbol for curie is Ci.
219	23	μ Ci	μCi	Typographical error.

### Chapter 11

Page	Line	Original	Corrected	Comments
227	9	Standard radioactive Material	Standard Radioactive Material	Typographical error.
227	17	8.3.1	8.2.1	Typographical error.

### Chapter 12

Page	Line	Original	Corrected	Comments
246	1	11.1	11.2.3	Typographical error.
251	10	4.2	4.1	Typographical error.
253	4	4.5.2	4.7.2	Typographical error.
254	14	4.5.2	4.7.2	Typographical error.
258	28	9.4.5	9.3.5	Typographical error.

### Chapter 13

Page	Line	Original	Corrected	Comments
261	Foot-note 1	ELI Group, Inc., 3619 Wiley Rd., Montgomery, AL 36106	ELI Group, Inc., 3619 Wiley Rd., Montgomery, AL 36106; email: radlab@charter.net	Combines redundant footnotes 1 and 3 into a single footnote.
261	Foot-note 3	Charles R. Porter, ELI Group, Inc., 3619 Wiley Rd., Montgomery, AL 36106; email: radlab@charter.net	(delete)	Combines redundant footnotes 1 and 3 into a single footnote.
271	Figure 13.4	Hepa	HEPA	Typographical error.
271	Figure 13.4	Nozzels	Nozzles	Typographical error.
277	27	non-corrosive	corrosion-resistant	Suggested change. Chapter author (Charles R. Porter) concurs.
277	21	DOE Order 5400.5.	DOE Order 5400.5, <i>Environmental Radiation Protection</i> (online at <a href="http://www.directives.doe.gov">http://www.directives.doe.gov</a> as of Dec. 2005).	This is the first reference to DOE Order 5400.5. The title of the order and URL should be mentioned here.
281	9	September 11th 2001	September 11th, 2001	Typographical error.
282	1-2	The laboratory and specified personnel must be certified as capable of handling such classified information, and personnel must have the appropriate security classification.	The laboratory must be approved for access to classified information, and personnel must have the appropriate security clearances.	Suggested change. Chapter author (Charles R. Porter) concurs.
285	26	14.2	14.3	Typographical error.
286	12	DOE Order 5400.5, <i>Environmental Radiation Protection</i> (online at <a href="http://www.directives.doe.gov">http://www.directives.doe.gov</a> as of Dec. 2005).	DOE Order 5400.5.	This is the second reference to DOE Order 5400.5. The title of the order and URL should be mentioned on page 277, line 21 (see above).

## Chapter 14

Page	Line	Original	Corrected	Comments
302	35	ms <sup>-1</sup>	m s <sup>-1</sup>	Typographical error. Represents reciprocal milliseconds as written.
304	39	flammable—gas	flammable-gas	Typographical error (hyphen).
305	18	50 Volts	50 volts	Modern convention. Units of measurement are not capitalized when spelled out.
306	5	course or an experimental	course of an experimental	Typographical error (of).
308	27	probability	possibility	Suggested change.
313	24	HazMat	HAZMAT	Suggested change (for consistency).
313	32	HazMat	HAZMAT	Suggested change (for consistency).
315	31	U. S.	U.S.	Typographical error.
316	21	(ACS 2002)	(ACS 2003)	Typographical error.
317	25	Handbook(Shleien	Handbook (Shleien	Typographical error (space between “Handbook” and parenthesis.)

## Chapter 15

Page	Line	Original	Corrected	Comments
322	6	secure shell (ssh)	Secure shell (SSH)	Suggested change (more common usage).
325	37	8.5.2	8.3.2	Typographical error.

## Chapter 16

Page	Line	Original	Corrected	Comments
338	34	Joliot–Curies	Joliot–Curie –or– the Joliot–Curies	Typographical error.
340	2–3	The p shells are filled in elements 113 through 118, which are expected to be the heaviest members of the noble gas group.	The p shells are filled in elements 113 through 118, which are expected to exhibit noble-gas-like behavior.	Suggested change. If one defines “noble gas” as having all valence electrons filled, then the original sentence should not be changed. If “noble gas” is defined as having all shells populated by electrons completely filled, the suggest change might be in order.
342	4	Gessellschaft	Gesellschaft	Typographical error.
344	23	Gregorich et al. (2002)	Gregorich et al. (2003)	Typographical error.
350	7	$\gamma$ -emitting	$\gamma$ emitting	The “ $\gamma$ ” should be italicized.
350	8	$\alpha$ -emitters	$\alpha$ -emitters	The “ $\alpha$ ” should be italicized.
352	Figure 16.7	RfCl <sub>4</sub>	RfCl <sub>4</sub>	Typographical error (font size).
354	13	molecular–orbital	Molecular orbital	Typographical error.
355	1	<sup>212</sup> Po <sup>m</sup>	<sup>212m</sup> Po	Typographical error.
355	12	96 ± 1 kJ mol <sup>−1</sup>	−96 ± 1 kJ mol <sup>−1</sup>	Typographical error (negative sign).
355	17	7.4 + 3.3/ − 2.7 s	7.4 +3.3/−2.7 s	Typographical error (delete extra space after “+”, “/”, and “−”).
355	18	21 + 20/ − 12 s	21 +20/−12 s	Typographical error (delete extra space after “+” and “/”, and “−”).
355	42	<sup>257</sup> No	<sup>257</sup> No	Typographical error (space between “257” and “No”).
357	12	N -type	N-type	Typographical error (space between “N” and hyphen).
358	10	1·10 <sup>5</sup>	1×10 <sup>5</sup>	Typographical error.

## Chapter 17

Page	Line	Original	Corrected	Comments
363	30	<i>m/z</i>	<i>m/z</i>	Typographical error (“ <i>m</i> ” should not be bold).
364	38	17.2.9	17.3.3	Typographical error.
370	9	quadrupole-time-of-flight	quadrupole-time-of-flight	Typographical error (should be hyphen-en dash-hyphen).
371	26	source-to-magnet	source-to-magnet	Typographical error (should be hyphens).
371	26	collector-to-magnet	collector-to-magnet	Typographical error (should be hyphens).
371	30	R	<i>R</i>	Typographical error (variables are italicized).
371	31	V	<i>V</i>	Typographical error (variables are italicized).
372	5	(in units of electron charge <i>e</i> )	(in units of electron charge <i>e</i> )	Typographical error (variables are italicized).
373	20	17.1.4	17.2.4	Typographical error.
377	1	milli-Torr	millitorr	Modern convention.
377	17	Fourier Transform	Fourier transform	Modern convention.
378	4	<i>e</i>	<i>e</i>	Typographical error (variables are italicized).
379	5	KV	kV	Modern convention.
379	20	1–10 %	1–10%	Typographical error (eliminate space before “%”).
379	21	high precision	high-precision	Typographical error.
379	21	high speed	high-speed	Typographical error.
381	10	KV	kV	Modern convention.
384	40	<i>N</i> <sup>-1/2</sup>	<i>N</i> <sup>-1/2</sup>	Typographical error (variables are italicized).
384	40	N	<i>N</i>	Typographical error (variables are italicized).
385	28	(cf. (Heumann, 1992; Yu et al., 2002))	(cf. Heumann, 1992; Yu et al., 2002)	Typographical error (redundant parentheses).
387	11–12	(Reyes et al., 2003)(Bings et al. 2002)	(Reyes et al., 2003; Bings et al. 2002)	Typographical error.
389	34	ug/mL	µg/mL	Typographical error.
389	35	ug/min	µg/min	Typographical error.

### Chapter 17 (continued)

<b>Page</b>	<b>Line</b>	<b>Original</b>	<b>Corrected</b>	<b>Comments</b>
390	23	m/z	<i>m/z</i>	Typographical error (variables are italicized).
395	16	Tesla	tesla	Modern convention. Units of measurement are not capitalized when spelled out.
405	24–25	(Marcus and Broekaert, 2002)(Baude et al., 2000)	(Baude et al., 2000; Marcus and Broekaert, 2002)	Typographical error.
407	1	sub-femto-gram	sub-femtogram	Modern convention.
409	1	10 <sup>5</sup> atom	10 <sup>5</sup> atom	Typographical error.

## Book Appendices

Page	Line	Original	Corrected	Comments
417	23–24	(Extraneous line break)	(delete line break)	Delete extraneous line break.
419	18	(Column headers)	(Delete row)	Typesetting error.
419	19–20	(Typesetting error)	(Reset in columns 3 and 4 of lines 14 and 15)	Typesetting error. These should be in columns 3 and 4 of lines 14 and 15.

## Glossary

Page	Definition	Original	Corrected	Comments
421	<b>amu</b>	<i>Dalton</i>	dalton	Typographical error (should not be italicized). Also, units of measurement are not capitalized when spelled out.
422	<b>atomic number (Z)</b>	(Z)	<b>(Z)</b>	Typographical error (“(Z)” should be boldface).
422	<b>Avogadro’s Number (<math>A_V</math>)</b>	( $A_V$ )	( $A_V$ )	Typographical error. Variables are italicized.
422	<b>Avogadro’s Number (<math>A_V</math>)</b>	mol	mole	Typographical error.
422	<b>Avogadro’s Number (<math>A_V</math>)</b>	$A_V =$	$A_V =$	Typographical error. Variables are italicized.
422	<b>Avogadro’s Number (<math>A_V</math>)</b>	$N_A$	$N_A$	Typographical error. Variables are italicized.
423	<b>Bequerel (Bq)</b>	$1 \text{ s}^{-1}$	$1 \text{ s}^{-1}$	Typographical error (delete space between “s” and minus sign).
425	<b>Dalton</b>	<b>Dalton</b>	<b>dalton</b>	Typographical error. Units of measurement are not capitalized when spelled out.
426	<b>electron volt (eV)</b>	<b>electron volt (eV)</b>	<b>electronvolt (eV)</b>	Modern convention.
426	<b>electron volt (eV)</b>	1 V stated	1 V. Stated	Typographical error
426	$E_{\max}$	$E_{\max}$	$E_{\max}$	Typographical error (should be boldface).
428	<b>half-life (<math>t_{1/2}</math>)</b>	$t_{1/2}$	$t_{1/2}$	Typographical error (variables are italicized).
428	<b>ICP/MS</b>	ICP/ MS	ICP/MS	Typographical error (delete space).

### Glossary (continued)

Page	Definition	Original	Corrected	Comments
431	<b>nuclide</b>	$^{234m}\text{Pa}$	$^{234m}\text{Pa}$	Typographical error (the “ <i>m</i> ” should be italicized).
434	<b>secure shell (ssh)</b>	<b>(ssh)</b>	<b>(SSH)</b>	“SSH” is in more common usage.
435	<b>stopping power</b>	(dE/dx)	<i>(dE/dx)</i>	Typographical error (variables are italicized).
435	<b>STP</b>	273° Absolute	273.15 kelvin	Suggested change. This is the more common usage (absolute temperature units are “kelvins” and not “degrees kelvin”).
436	<b>X-ray</b>	<b>X-ray</b>	<b>X ray</b>	Typographical error.
436	<b>X-ray</b>	electron volts	electronvolts	Modern convention.
436	<b>X-ray</b>	kiloelectron volts	kiloelectronvolts	Modern convention.



## Appendix A: Derivation of Equations (3.4) and (3.5)

The quantity  $[(A^{b+})_0 - (A^{b+})]$  represents the amount of cation  $A$  and  $[(B^{a-})_0 - (B^{a-})]$  represents the amount of anion  $B$  precipitated from solution. In order to maintain stoichiometric balance, the precipitate must form in the following proportion:

$$a[(A^{b+})_0 - (A^{b+})] = b[(B^{a-})_0 - (B^{a-})]$$

Simple rearrangement yields:

$$-(A^{b+}) = -(A^{b+})_0 + (b/a)[(B^{a-})_0 - (B^{a-})]$$

$$(A^{b+}) = (A^{b+})_0 + (b/a)[(B^{a-}) - (B^{a-})_0]$$

$$(A^{b+}) = (A^{b+})_0 - (b/a)(B^{a-})_0 + (b/a)(B^{a-})$$

The solubility product is defined as

$$K_{sp} = [A^{b+}]^a [B^{a-}]^b$$

When concentrations are sufficiently low that they can be substituted for thermodynamic activity,

$$K_{sp} = (A^{b+})^a (B^{a-})^b$$

Substitution yields:

$$(B^{a-})^b = \frac{K_{sp}}{(A^{b+})^a} = \frac{K_{sp}}{[(A^{b+})_0 - (b/a)(B^{a-})_0 + (b/a)(B^{a-})]^a} \quad (3.4)$$

and

$$\frac{(B^{a-})^b}{(B^{a-})_0^b} = \frac{K_{sp}}{(B^{a-})_0^b [(A^{b+})_0 - (b/a)(B^{a-})_0 + (b/a)(B^{a-})]^a} \quad (3.5)$$

Thus, equations (3.4) and (3.5) as printed appear to be incorrect.

Note that it turns out that equation (3.6) is correct by virtue of the fact that  $a = b = 1$ , masking the error in equation (3.4).

## Appendix B: Derivation of Equation (4.4)

Eq.(4.4) is derived by combining the following two equations:

$$S_i = \frac{R_i}{m_{Ri}} \quad (4.2)$$

$$S_f = \frac{R_i}{m_{Ri} + m_i} \quad (4.3)$$

Rearranging (4.2), one obtains  $R_i = S_i m_{Ri}$  :

$$S_f = \frac{S_i m_{Ri}}{m_{Ri} + m_i},$$

$$m_{Ri} + m_i = \frac{S_i m_{Ri}}{S_f},$$

$$m_i = \frac{S_i m_{Ri}}{S_f} - m_{Ri},$$

$$m_i = m_{Ri} \left( \frac{S_i}{S_f} - 1 \right). \quad (4.4)$$

The formula on page 72 as printed appears to be typeset incorrectly.

**Appendix C: Table 8.1.**

The table, as printed in the book is corrupt. The corrected table submitted by J.M. Keller, the original author of chapter 8, is:

Detector Type	Sensitive Volume (cm <sup>3</sup> )	Radiation Type	Energy (keV)	Efficiency (%)	Background (c/m)	Conditions
Proportional	28	alpha	4,000-7,000	20	0.05	Anti-coincidence
		beta	100-3,500	45	1	
LS	20	alpha	4,000-7,000	>95	2	10 mL H <sub>2</sub> O
	20	beta	1-18	25	5	
	20	beta	250-3,500	>90	20	
LS	1	alpha	4,000-7,000	99.7	0.001	PERALS
Si spec	0.06	alpha	4,000-7,000	25	0.0001	Electrodeposited source
Ge spec	85	gamma	100-103	0.15	0.5	Flat Source
			500-505	0.063	0.3	Flat Source
			1,000-1,006	0.035	0.15	Flat Source
			2,000-2,007	0.011	0.011	Flat Source

Table 8.1 Typical values of radiation detector counting efficiency and background



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