Note: Corrections are listed in the order in which they appear in the book. To facilitate updating your list, I have indicated the date when each entry was added. That way, you can easily determine whether the entry is new since you last reviewed the errata. All entries prior to 9/11/01 have been assigned a date of 9/01/01.

1. **(2/22/05)** Inside back cover: the final value shown for $RT_{298.15K}$ should be 24.79 L-bar/mol (not 24.17 L-bar/mol).

2. **(2/25/04)** p.3. In Table 1.1., the concentration of Mg^{2+} in seawater should be given as 1280 mg/L, not 128 mg/L.

3. **(11/28/01)** p.12. In footnote 8, statement should say that the SI unit for pressure is Pascal (Pa). Also, the value at the end of footnote should be 100 kPa, not 1000 kPa.

4. **(9/1/01)** p.18. In the two equations at the end of the Example, every place where the word mol appears (eight times, in total), it should be changed to mmol.

5. **(1/16/02)** p.30. In Table 1.4a, in the explanation of the terms in the Extended Debye-Huckel equation, the expression for *B* should be: $B = 50.3(\varepsilon T)^{-1/2}$ (in the book, the minus sign is missing from the exponent).

6. **(11/28/01)** p.32. In the upper figure, the values on the x-axis should be 10^{-5}, 10^{-4}, etc.

7. **(10/22/01)** p.41. In Equation (1.10), the *B* should be in brackets { }, not parentheses ( ).

8. **(10/15/01)** p.53. Add the following sentence to the end of question 6: Note that, because the application of interest involves transfer of electrons, the concentration *as* Cl_2 is based on an equivalency in terms of the number of electrons transferred.

9. **(10/2/01)** p.76. Equation 2.19 and the sentence immediately before it should be deleted.

10. **(10/01/03)** p.77, second line from bottom: delete the word "and" after the comma.

11. **(10/25/03)** p.79, Equation 2.30: the left hand side should be $\frac{d\mathrm{PE}_{\mathrm{tot}}}{dx}$.

12. **(9/1/01)** p.82. A footnote should be associated with the last line on the page. The footnote should read: The Gibbs energy is also commonly referred to as the *Gibbs free energy* or simply the *free energy*.

13. **(9/11/01)** p.103-104. In Example 2.6, the last few words of the problem question should be: …to form 2 moles of pure liquid water.

In the answer (p.104), the value –237.18 kJ appearing three lines above the end should be changed to 2(–237.18 kJ) = –474.36 kJ. The final sentence of the answer should be revised as follows: The difference between these two values, equal to –399.43 kJ, is the amount of Gibbs energy that is consumed when the reaction proceeds, i.e., 399.43 kJ of Gibbs energy is released.

14. **(9/1/01)** p.109. In the equation at the end of Example 2.8, a minus sign should be added to the middle expression in the equation, and the minus signs should be removed from the final expression in the equation and the exponent of K_{eq}. That is, the final line of the example should be:

$$\log K_{eq} = -\frac{\Delta \overline{G}_r^{o}}{5.71 \text{ kJ/mol}} = 9.2 \qquad\qquad K_{eq} = 10^{9.2}$$

15. **(9/17/01)** p.109. In the solution to Example 2.9, the value +16.45 kJ/mol on the first line after the calculation of K_{eq} should be +16.32 kJ/mol.

16. **(10/25/03)** p.110, first line: the reference to Equation (2.79) should be to Equation (2.80).

17. **(10/08/03)** p.111, Example 2.10. In the fourth line of the solution to part *a* (the second equation shown), the left hand side of the equation should be $\Delta \overline{G}_r^{o}$ instead of $\Delta \overline{G}_r$.

18. **(9/23/03)** p.111-113, Example 2.10. In the problem statement, in part *b*, lines 1-2, replace the phrase "a system," with "1.0 L of a solution." At the end of that sentence, add the sentence: Assume that the molar volumes of H_2O, $HCrO_4^-$, and $Cr_2O_7^{2-}$ are all equal (1 L per 55.56 mol), so that the solution volume remains constant as the reaction proceeds.

    On the first line of p.112, replace "Assuming that" with "Because."

    Revise footnote 13 as follows: Although the activity of water is very nearly 1.0 regardless of the distribution of Cr species, the number of moles of H_2O in the solution changes slightly when some of the Cr converts from one form to the other. As a result, the contribution of H_2O to G_{tot} changes as the reaction proceeds, and this change must be taken into account.

    Revise Equation (2.92) by placing the V on the right hand side:

$$G_{tot} = V\left[c_{H_2O}\left(\overline{G}^{o}_{H_2O} + RT \ln \frac{c_{H_2O}}{\sum c_i} \right) + c_{HCrO_4^-}\left(\overline{G}^{o}_{HCrO_4^-} + RT \ln c_{HCrO_4^-} \right) \right. \\ \left. + c_{Cr_2O_7^{2-}}\left(\overline{G}^{o}_{Cr_2O_7^{2-}} + RT \ln c_{Cr_2O_7^{2-}} \right) \right] \qquad \textbf{(2.92)}$$

In the second line below Equation (2.92) replace “water” with “total species.”

Revise Equation (2.94) as follows:

$$a_{H_2O} = \frac{55.56 - c_{HCrO_4^-} - c_{Cr_2O_7^{2-}}}{55.56} = \frac{55.56 - c_{HCrO_4^-} - 0.5\left(0.10 - c_{HCrO_4^-}\right)}{55.56}$$

$$= \frac{55.51 - 0.5c_{HCrO_4^-}}{55.56} \qquad \textbf{(2.94)}$$

In the second line below Equation (2.94), delete “per unit volume of solution.” In the third and fourth lines below the equation, change “G_{tot}/V” to “G_{tot}.”

Replace Figure 2.8 and its caption with the following figure (note: the values on the *y* axis have changed, and the *y* axis label now represents G_{tot}, not G_{tot}/V).

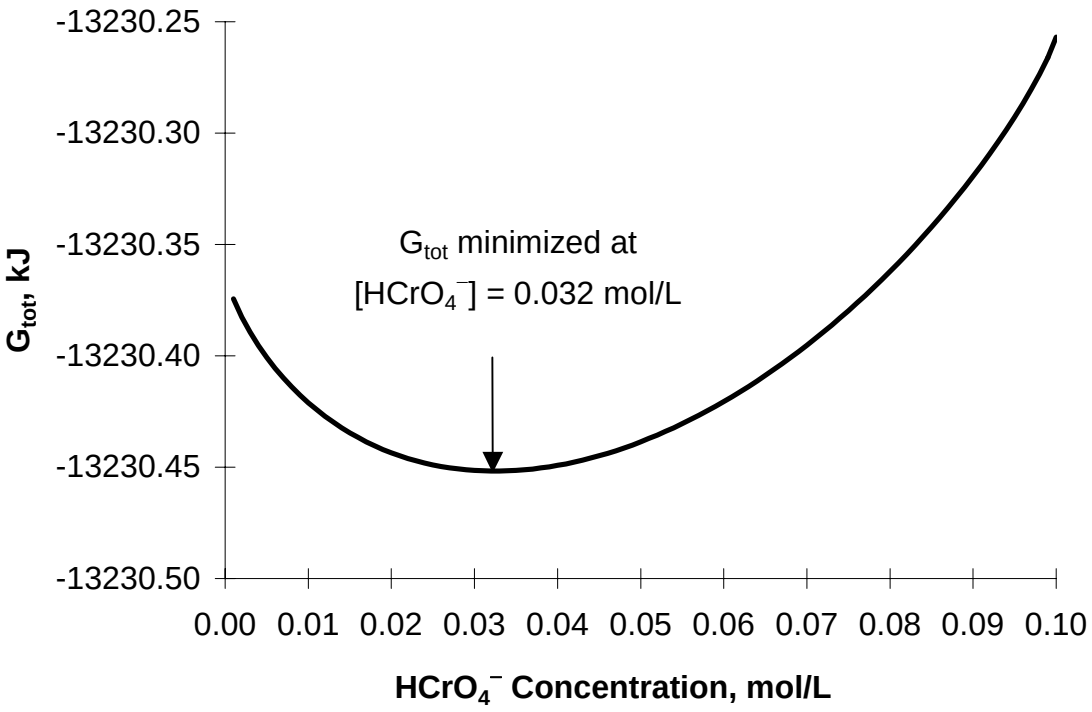


Figure 2.8 Total Gibbs energy of 1.0 L of a solution containing 10^{-1} M $c_{Cr,tot}$, as a function of the $HCrO_4^-$ concentration.

19. **(10/25/03)** p.110, first line: the reference to Equation (2.79) should be to Equation (2.80).

20. **(10/25/03)** p.116, first equation in solution to Example 2.12: replace 16.40 with 16.32.

21. **(11/28/01)** p.123. In Equation 2.114, the term on the left is missing a superscript ^{o}; it should be $\Delta\overline{G}^{o}_{r,\text{overall}}$.

22. **(10/25/03)** p.124, solution to Example 2.14: In last equation in part *b* and both equations in part *c*, replace 3.03 with 2.96, and 1.74 with 1.72.

23. **(10/11/05)** p.128, Problem 3. At the end of the paragraph preceding part *a*, add: Reaction 1 is at equilibrium, but Reaction 2 might not be.

24. **(11/13/03)** p.135: In Equation 3.5, change 10^{-1} to 1.

25. **(10/25/03)** p.136: second line of caption to Figure 3.3: replace Al^{3+} with Cu^{2+}.

26. **(12/16/01)** p.139. Add the values 11.60 for pK_{a3} for arsenic acid (H_3AsO_4) and 13.41 for pK_{a3} for arsenous acid (H_3AsO_3). Make the same changes in the copy of this table on p.642.

27. **(11/19/01)** p.139. Footnote. The equilibrium constants used in the text are from the version of Mineql+ that was current at the time of printing. Since that time, a new version of the software has been distributed, with updated constants. Therefore, not all of the constants used in the text are consistent with those in the current version of Mineql+.

28. **(10/5/01)** p.157. In the first line on the page, the reference should be to Figure 3.11, not Figure 3.10.

29. **(10/5/01)** p.158. In the line just above Table 3.4, the reference should be to Equation (3.29a), not Equation (3.28a).

30. **(10/5/01)** p.159. In Figure 3.15, the curve that goes from (7.7,–7) to (13,–2) should be deleted. In the caption to Figure 3.15, the pK_a values should be 6.35 and 10.33. In the second line below the end of the example, the reference should be to Equation (3.31d), not (3.28). Two lines below that, the reference should be to Figure 3.15, not Figure 3.14.

31. **(2/14/03)** p.160, line 2. “undergoes *k*” should be “undergoes *n*”

32. **(9/20/01)** p.168. In the table under Step III, in the line for Na, the middle term on the right-hand side [the term shown as $(10^{-4})(1)$] should be deleted. Also, in the last paragraph on the page, the words nine and four should be changed to seven and three (each word appears twice).

33. **(10/22/01)** p.176. In Equations (3.42) and (3.43), the sign before $\{Na^+\}$ should be –, not +.

34. **(9/1/01)** p.178. In the first sentence of the first full paragraph, after the word spreadsheet, insert the phrase: "for a solution of 10^{-3} *M* NaPr." Then, after the reference to Table 3.5, insert a period, and start the next sentence with "The table includes a column…"

35. **(9/11/01)** p.179. In the first full paragraph, replace the numbers 3.0, 4.0, 3.9, 4.9, and 3.96 with 7.0, 8.0, 7.9, 8.0, and 7.96, respectively.

36. **(11/12/03)** p.184-185. On the bottom line of the table on p.184, the pH of the solution with [NaCl] = 0.1 *M* should be 3.30. Also, add a line to the bottom of that table, for the species "log $[H^+]$". On this line, below the values of 3.26 and 3.30 on the "pH" line, put values of –3.26 and –3.19, respectively.

    Revise paragraph at bottom of p.184 and top of p.185 as follows: The water with NaCl has slightly higher H^+ and F^- concentrations than the salt-free solution, because the salt decreases the activity coefficients of these two species. Since the activity coefficient of HF is 1.0 in both solutions, the decreases in γ_{H^+} and γ_{F^-} force more HF to dissociate to satisfy the K_a expression, and this extra dissociation releases more H^+ and F^- to solution. Correspondingly, the concentration of HF that remains undissociated declines. Despite the increase in the concentrations of H^+ and F^-, the activity of each of these species declines, because their activity coefficients decline. The resulting, fractional decline in the product $\{H^+\}\{F^-\}$ is exactly equal to the fractional decline in {HF}, so the ratio $\{H^+\}\{F^-\}/\{HF\}$ is the same as in the solution with no NaCl, and equal to K_a. Because $\{H^+\}$ is lower in the salty solution, pH is higher, as indicated. The effect of the salt would be greater if more highly charged species were involved (for example, CO_3^{2-} or PO_4^{3-}).

37. **(10/22/01)** p.186. In question 2a, delete the words Using those values and K_w. Question 4c should be deleted, and 4d should be renamed 4c.

38. **(9/25/03)** p.187. In question 5, the correct formula for ascorbic acid is $C_5H_9O_4$–COOH.

39. **(11/28/01)** p.191. The values in the first row of Table 4.1 should be 6.0, –8.00, –3.03, and –3.03. Also, a row should be inserted above the existing top row, with values: 4.0, –10.00, –3.92, and –3.92.

40. **(10/22/01)** p.195. About one-third of the way down the page, in the "Modified CB," the $\{OH^-\}$ on the left-hand side of the equation should be deleted and replaced by $\{H^+\}$.

41. **(11/08/01)** p.198. In the first line of the solution to Example 4.3, *TOT*NH_3 should be $5x10^{-4}$ *M*, not $5x10^{-3}$ *M*.

42. **(10/26/05)** p199, part a, last equation: should be "(where $\{H^+\} = \{OCl^-\}$)" instead of (where $\{H^+\} + \{OCl^-\}$)".

43. **(9/1/01)** p.199. In part c, replace the phrase "since $\{Na^+\}$" with the phrase "since $\{Cl^-\}$"

44. **(10/25/03)** p.202, final line: Last two terms in the equality should be $10^{1.77}$ and 58.9, instead of $10^{-1.77}$ and 0.017.

45. **(9/1/01)** p.205. In the section **Defining the Baseline Concentration of H**, in the fourth row, CO_3^- should be CO_3^{2-}.

46. **(9/1/01)** p.212. In part d, in the equation just above the PC, the term $\{OCl^-\}(-1)$ should be replaced by a term $\{HOCl\}(1)$. The PC equation should then be modified to:

    $$\{H^+\} + \{NH_4^+\} + \{HOCl\} + 4x10^{-4} = \{OH^-\}$$

    And, the *TOT*H equation following the next paragraph should be modified to:

    $$-4x10^{-4} = \{H^+\} + \{NH_4^+\} + \{HOCl\} - \{OH^-\}$$

47. **10/21/03)** p.217-218. In the table near the bottom and the equation immediately below it, the values $1.0x10^{-10}$ and $1.0x10^{-4}$ should be replaced by $7.94x10^{-11}$ and 1.26×10^{-4}, respectively. Also, in the table, the values 0.56×10^{-4} and 0.44×10^{-4} should be reversed.

    In addition, on the last line of the page, the value $-1.56x10^{-4}$ should be replaced by $-1.82x10^{-4}$. The same replacement should be made on p.218 in the third-to-last line of the example, and the value $1.12x10^{-4}$ in the final two lines should be replaced by $1.13x10^{-4}$.

48. **(10/28/05)** p.229. In the table, in the row with the $Cu(NH_3)_x^{2+}$ species, the entry under **–2** should be $Cu(NH_3)_4^{2+}$, and the entry under **+1** should be $Cu(NH_3)^{2+}$.

49. **(1/27/03)** p.231. Most of question 4a is irrelevant, since the values were inadvertently printed on the axes.

50. **(9/25/01)** p.233. In problem 4-8, add the following sentence after the first sentence in the problem statement: The fully protonated form of the acid is H_4A. Also, later in the problem statement, the charges of the species H_3A^- and HA^{3-} should be shown.

51. **(10/25/03)** p.249, solution to Example 5.2: In the fourth line of the second paragraph, replace $2.67x10^{-3}$ and 0.67 with $3.32x10^{-3}$ and 0.83, respectively. Later in the paragraph, replace $4.92x10^{-3}$ with $5.57x10^{-3}$. Make the corresponding changes (3.32 for 2.67 and 5.57 for 4.92 in the summation at the end of the example.

52. **(11/28/01)** p.251. The fifth data point on the titration curve should be labeled 0.016, 3.75.

53. **(11/28/01)** p.252. In the second line above the section break, the value 8.5 should be replaced by 5.5.

54. **(10/25/03)** p.254, fourth line from bottom: replace "large" with "wide."

55. **(10/28/03)** p.255. In the last line on the page, H_2CO_2 should be H_2CO_3.

56. **(10/28/05)** p.264. In the table, the entries for Cl^- and HCl should not be italicized.

57. **(10/25/03)** p.272. In the second line of the *Solution*, part *a*, replace "base" with "acid."

58. **(10/5/01)** p.283, 284, 286. On the graphs on all three of these pages, in the y-axis label, change (meq/L) to (equiv/L). Also, in the caption for Figure 5.17, the value 2×10^{-2} should be 2×10^{-3}.

59. **(9/28/01)** p.283. In Equation 5.23, the summation that goes from $i = 0$ to n should go from $i = 0$ to $n - 1$.

60. **(10/27/03)** p.284. In part *b* of the answer to Example 5.10, the reference shown to Table 5.5 should actually be to Table 5.6.

61. **(10/28/03)** p.284. In part *b*, in the equation on for β_{PO_4}, the value 10^{-3} should be 10^{-2}.

62. **(10/28/03)** p.285. In the table at the top of the page, β_{NH_3} at pH 9.25 (the last entry in the last column) should be 1.73×10^{-2}.

63. **(10/28/03)** p.286. In part *b* of the answer to Example 5.11, the reference shown to Table 5.5 should actually be to Table 5.6.

64. **(10/28/05)** p.288. Problem 1(a)(vi): pK_{a1}, pK_{a2}, and pK_{a3} should be 3.13, 4.72, and 6.33, respectively.

65. **(10/30/01)** p.289. In problem 5-7, change p*K_1, p*K_2, p*K_3, and p*K_4 to pK_{a1}, pK_{a2}, pK_{a3}, and pK_{a4}, respectively, and change the initial pH from 0.8 to 0.88.

66. **(2/13/03)** p.290. In problem 9, the first reaction shown should be:

$$CH_3COOH + H_2O \leftrightarrow CH_4 + H_2CO_3$$

Part *b* of the question should be reworded as follows: What would the solution pH be if all the sulfite were destroyed by the second reaction, and then all the acetic acid that remained was destroyed by the first reaction?

67. **(2/13/03)** p.290. In problem 11, line 4, the word "strong" should be inserted before the word "acid."

68. **(11/08/04)** p.292. In Problem 14, second paragraph, second sentence: replace "contains negligible Ca^{2+} and alkalinity" with "can be represented as a mixture of water, H_2NOM, and NaCl".

69. **(10/31/03)** p.299: In the chemical reaction shown at the bottom of the page, the coefficient 1 for $\mathbf{H^+}$ should be underlined.

70. **(10/31/03)** p.301: In the table near the top of the page, the heading **Stoichiometric Coefficient** should be centered over the three columns labeled $\mathbf{H_2O}$, $\mathbf{OH^-}$, and **HAc**, and the underline under that heading should extend only over those three columns.

71. **(11/28/01)** p.323. In the footnote, replace the words "*bar*, where" with the words "*Pascal* (Pa)." Also, in Equation 7.1, the letter V should be V_G.

72. **(11/13/03)** p.332. In Table 7.2, change the value for CO_2 from 28.8 to 30.2. Also, in the footnote, change 20^oC to 25^oC. Make the same changes in the copy of the table on p.643.

73. **(11/28/01)** p.334. In the first equation on the page, the left parentheses should be before the fraction $1/T_1$.

74. **(2/7/03)** p.334. In the fourth line of the caption for Figure 7.2, change "that concentration of Cl^- and" to "the concentration of Cl^- indicated, and"

75. **(11/13/03)** p.336: In the first equation in the solution to Example 7.3, in both places where ^oC appears in the denominator of the fraction, it should be change to K (Kelvins).

76. **(11/28/01)** p.339. In the first equation on the page, the number 5.48 should be replaced by 5.88.

77. **(10/21/02)** p.341. In the equation just above 7.22, the coefficient "2" preceding {HAc} should be deleted.

78. **(2/7/03)** p.342. The second paragraph in the Solution to Example 7.6 should begin, "Rather than write a charge balance…"

79. **(11/08/01)** p.344. The caption to the figure at the top of the page should refer to Example 7.6, not Figure 7.6.

80. **(11/10/03)** p.347. In the PC table, the values in the right hand column should be 2.96×10^{-5}, 4.44×10^{-5}, and 7.40×10^{-5}.

81. **(11/10/03)** p.348. In Equation (7.23), the subscript on the first $\{OH^-\}$ in the equation should be changed from fii to fin.

82. **(11/08/01)** p.351. Two signs are in error in the equation just above the photograph. The last two terms in the equation should be $-\left\{H^+\right\}+\left\{OH^-\right\}$.

83. **(11/13/03)** p.354: In the table at the bottom, the equilibrium concentration of HCO_3^- should be 1.95×10^{-3}.

84. **(11/13/03)** p.358: In problem 8c, the mass balance should state that the rate at which sulfur enters the column (moles of S per unit time), considering both inlet streams, equals the rate at which it leaves, considering both outlet streams, i.e., $(Q_{\text{gas,in}}c_{\text{S,gas,in}}+Q_{\text{aq,in}}c_{\text{S,aq,in}} = Q_{\text{gas,out}}c_{\text{S,gas,out}}+Q_{\text{aq,out}}c_{\text{S,aq,out}}$.

85. **(11/28/01)** p.358. Replace the last word on the page (STP), with $T = 25^{o}$C.

86. **(11/28/01)** p.359. In Problem 9, delete the second sentence in the problem statement; change the value from $10^{-4.82}$ to $10^{-4.8}$ in the first sentence of the problem statement and in part a; in part c, replace 5×10^{-3} *M* H_3PO_4 with 5×10^{-4} *M* NaOH.

87. **(11/13/03)** p.361: In Problem 16, line 3: change Example to Problem.

88. **(11/21/03)** p.368: In Table 8.2, Log β_3 for Hg^{2+} should be 32.16, and Log $*\beta_3$ should be –9.84. The same corrections are needed on the copy of Table 8.2 on p.644.

89. **(11/08/01)** p.372. The first three words on the second line in the caption to Figure 8.3 should be "deprotonated form ($EDTA^{4-}$)."

90. **(11/22/04)** p.375. In Table 8.3, the values in the NH_3 column in the rows corresponding to Zn^{2+} should be 2.2, 4.5, 7.0, and 9.0 for ZnL, ZnL_2, ZnL_3, and ZnL_4, respectively. The same changes should be made in the copy of Table 8.3 on p.646.

91. **(11/11/01)** p.377. The last paragraph should begin, "Figure 8.5…"

92. **(11/11/01)** p.378. The first two equations in the middle of the page are each missing terms of the type $\{Cd^{2+}\}$. They should be:

$$\left\{Cd(OH)_i^{2-i}\right\} = \beta_{OH,i}\left\{Cd^{2+}\right\}\left\{OH^-\right\}^i = \beta_{OH,i}\left\{Cd^{2+}\right\}\left(10^{-5.0}\right)^i$$

and

$$\left\{CdCl_i^{2-i}\right\} = \beta_{Cl,i}\left\{Cd^{2+}\right\}\left\{Cl^-\right\}^i = \beta_{OH,i}\left\{Cd^{2+}\right\}\left(0.5\right)^i$$

93. **(11/11/01)** p.381. The paragraph preceding Section 8.3 should begin, "Comparing Figures 8.2 and 8.6, …"

94. **(11/11/01)** p.386. The fifth line of the first paragraph in Section 8.5 should begin, "Figures 8.2 and 8.6, …" and the following line should begin, "Figure 8.5…"

95. **(12/22/03)** p.398. In Table 8.7, add the following entries to the table: HgO(*s*), $\log K_{s0} = -25.55$; $Hg(CN)_2$(*s*), $\log K_{s0} = -39.28$; SiO_2(*s*), $\log K_{s0} = -2.74$; ZnO(*s*), $\log K_{s0} = -16.12$. Also, Log K_{s0} for Hematite (α-Fe_2O_3) should be –81.26, and Log K_{s0} for Hydroxylapatite ($Ca_5(OH)(PO_4)_3$(*s*)) should be –58.2. The same changes should be made to the copy of Table 8.7 on p.647.

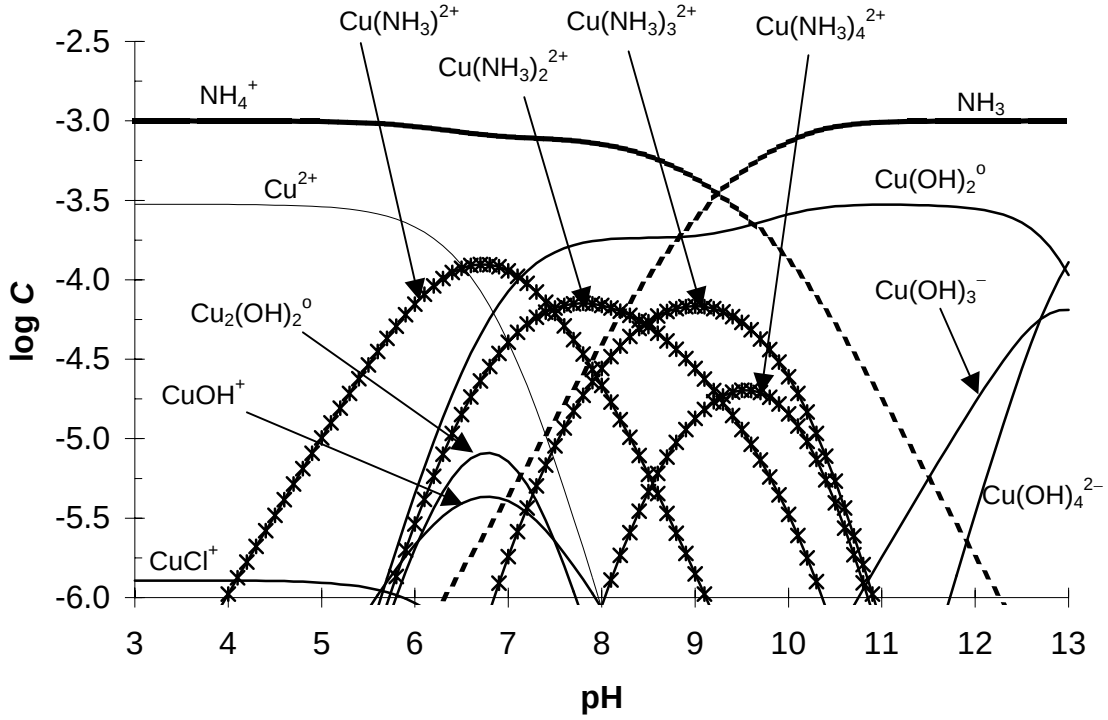
96. **(12/04/03)** p.418, 3rd line of final paragraph: change $10^{-13.73}$ to $10^{-14.73}$.

97. **(11/29/03)** p.420, line 9: change Figure 8.10 to Figure 8.12.

98. **(11/11/01)** p.453-456. The following equilibrium constants should be included for formation of Ag-S_2O_3 complexes as part of the problem statements for Problems 8-3, 8-8, and 8-12: $\log K_1 = 8.8$, $\log \beta_2 = 13.6$.

99. **(12/05/04)** p.456. In Problem 11, right before the last sentence, add: Ignore hydrolysis of Ca^{2+}.

100. **(2/27/03)** p.454. In problem 4, line 3, Cu should be Cu^{2+}. Also, the diagram shown in the text is incorrect. The correct diagram is shown below. In part *a*, line 3, the word "problems" should be replaced with the word "programs." In part *c*, add the words, "showing all species that are present at $>10^{-6}$ *M*" to the end of the question.



101. **(2/25/03)** p.455. In Problem 7, for Species B, the coefficient for NH_4^+ should be 0, and the log K should be 6.35.

102. **(9/23/03)** p.456. In Problem 13b, before the parenthetical remark about hydrolysis reactions, add the statement: Ignore formation of Al-SO_4 complexes.

103. **(9/29/01)** p.456. Add the following sentence to the end of the problem statement for problem 10: (Note: for $CaHPO_4(s)$, assume that K_{s0} is defined for dissociation into Ca^{2+} and HPO_4^{2-}.)

104. **(9/30/01)** p.458. In the second line of problem 8-17, change Cd^{2+} to *TOT*Cd.

105. **(3/5/03)** p.459. In the second paragraph of Problem 19, replace the wording at the end of the problem, starting with the sentence that begins "Carry

out the calculations…" as follows: Carry out the calculations twice, using first one and then the other of the following two assumptions. (1) The rain is in equilibrium with the atmosphere before striking the monument, but no more gases dissolve as the rain drips down the monument's surface; (2) The rainwater is in continuous equilibrium with the atmosphere as the water drips.

Also, at the end of the problem, add the following. Hint: for the systems that do not equilibrate continuously with the atmosphere, make a guess for the amount of solid that dissolves, and iterate on that guess until it is consistent with the charge balance.

106. **(3/5/03)** p.459. In Problem 20c, at the end of the first sentence, add: For amorphous silica, $K_{s0} = 10^{-2.74}$.

107. **(9/1/01)** p.460. In problem 8-23, add the following reaction at the end of the problem statement:

$$Fe^{3+} + 2\ H_2P_3O_{10}^{\ 3-} \leftrightarrow Fe(H_2P_3O_{10})_2^{\ 3-} \qquad \log K = 20.63$$

108. **(12/2/03)** p.473: in the solution to Example 9.4, part *a*, in the last line of text, delete the word 'is'.

109. **(11/28/01)** p.477 and p.648 (same table appears on both pages): the values in the row for the reaction $2\,H^+ + 2\,e^- \leftrightarrow H_2(aq)$ should be:–3.1 –1.55 –8.55 –92. Also, add a line below the line for the Fe^{3+}/Fe^{2+} equilibrium reaction, as follows:

$Fe^{2+} + 2e^- \leftrightarrow Fe(s)$ –14.90 –7.45 –7.45 –441

110. **(12/10/03)** p.486 and 499. At the bottom of Figures 9.4 and 9.5, the line for the $H^+/H_2(g)$ system should say pH 10.5, not pH 7.5.

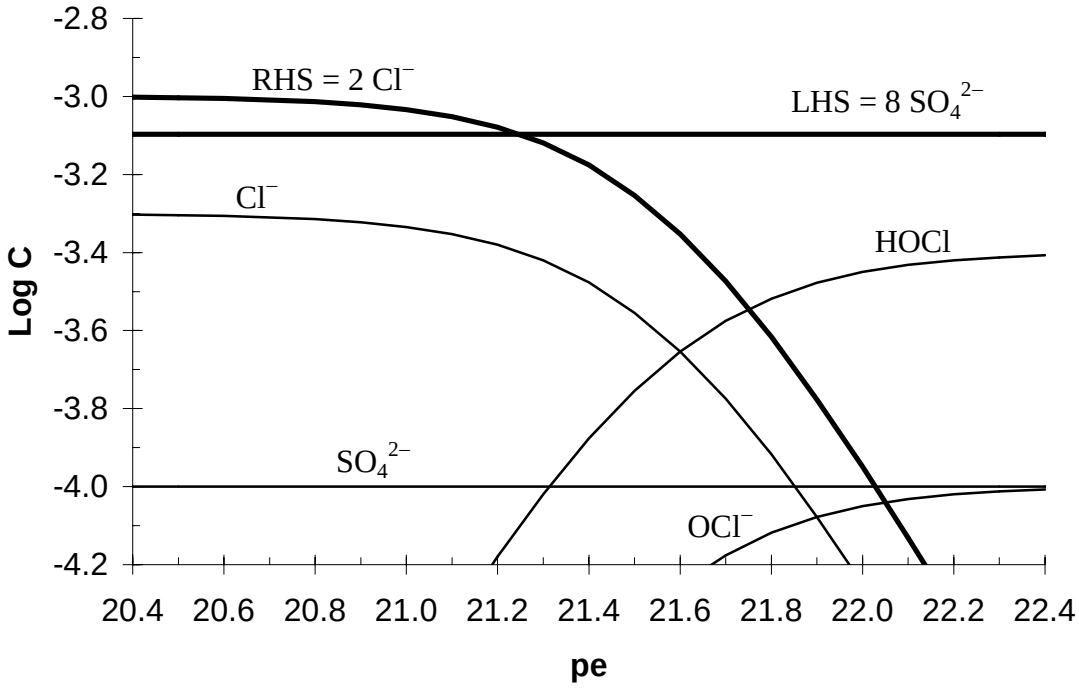
111. **(12/2/03)** p.500. In Table 9.5, entry #5, in the expression for Δpe, the final term should not have *RT* in the numerator; the expression should be as follows (note: the same correction is needed in the copy of Table 9.5 one-page 652):

$$\Delta pe = \Delta pe^o - \frac{1}{n_e} \log Q$$

112. **(12/2/03)** p.501, lines 2-3: The term $\overline{G}_{e^-}$ should be on one line.

113. **(3/10/03)** p.505. In the last equation on the page, above the final two paragraphs of text, the left hand side of the equation should be $8pe^o(W)$, not $8pe^o$.

114. **(3/10/03)** p.508. Figure 9.9 is missing curves for HOCl and OCl^-. The correct figure is shown below.



115. **(11/11/01)** p.510. In the group of four equations about two-thirds of the way down the page, the first value to the right of the equal sign is transposed in the first two equations. Those equations should start as follows:

$$\left\{CuCl_2^-\right\} = 5.5 + ...$$

and

$$\left\{CuCl_3^{2-}\right\} = 5.7 + ...$$

116. **(12/7/01)** p.545. The pH in part b of problem 2 should be 7.5.

117. **(3/5/03)** p.546. At the end of Problem 2, before the parenthetical remark, add the sentence: Consider HOCl, OCl^-, and Cl^- as the only significant Cl species.

118. **(3/5/03)** p.546. In Problem 3, paragraph 2, *TOT*Hg should be *TOT*Hg(II).

119. **(3/10/03)** p.547. At the end of part a in Problem 6, add the sentence: Assume that the acid/ base reactions in the system reach equilibrium quickly.

120. **(12/19/01)** p.549. Add the following statement to problem 11 before the parenthetical note at the end: Ignore redox reactions of water.

121. **(9/1/01)** p.552: the photo is of a trickling filter, not an activated carbon bed.

122. **(9/1/01)** p.559. In the last line before Equation 10.7 and the first and third lines after that equation, c_{fii} should be c_{fin}.

123. **(11/28/01)** p.564. In the equations below Table 10.1, the terms on the right hand side of each equation should be in brackets { }.

124. **(11/28/01)** p.575. In Equation 10.29, in the expression on the left hand side, delete the subscripts from the *K* terms.

125. **(9/1/01)** p. 596. In the first full paragraph, line 7 and after the words "range of" in line 8: κ should be κ^{-1}.

126. **(4/28/05)** p.596. The fractions in Equations 10.47 and 10.48 should all be inverted. The same fractions appear in the bottom of Table 10.6 on p.604, and the same corrections should be made to them.

127. **(10/28/02)** p.604. The minus sign should be removed from the exponential argument in the equation for $K_{A,int,o}$.

128. **(4/15/05)** p.607. The third and fourth equations in the middle of the page are both missing a term equal to $\{H^+\}^{-1}$ on the right-hand side. This term should appear in the middle of the equation, after the term $\{A^{2+}\}$.

129. **(11/28/01)** p.623. In the caption of Figure 10.27, NO_3^{2-} should be replaced by NO_3^-.

130. **(11/28/01)** p.645. The caption of Table 8.3 in A.4 should have a second sentence that reads: Values shown correspond to log β.

131. **(12/22/03)** p.647. Add values of –25.55 for log K_{s0} of HgO(*s*) and –39.28 for log K_{s0} of $Hg(CN)_2(s)$ to Table 8.7. Also, Log K_{s0} for Hematite (α-Fe_2O_3) should be –81.26, and Log K_{s0} for Hydroxylapatite ($Ca_5(OH)(PO_4)_3(s)$) should be –58.2.

132. **(12/6/01)** p.648. The version of Table 9.3 on this page is missing the reaction for reduction of BrO_3^- to Br^-. That reaction is shown in Table 9.3 on p.477. The reaction and the value for each of the columns in the table are:

$BrO_3^- + 6\,H^+ + 6\,e^- \leftrightarrow Br^- + H_2O$	146.1	24.35	17.35	1437

133. **(12/16/01)** p.651. In Equation 5.23, change upper limit of inner summation sign to $n-1$.