

**Corrections for *Chemical Principles: The Quest for Insight*, 3<sup>rd</sup> edition**  
by Peter Atkins and Loretta Jones

Corrections to the **second printing**:

Page

- F47 Example F.2, Step 3: Oxygen should be Nitrogen
- F72 Ex. J10, line 7: "1.029%" should be "3.087 %".
- 3 Line before Self-Test 1.1: "frequency near 700 nm" should be wavelength near 700 nm"
- 25 last line before paragraph summary: "1 + 3 + 4 + 5 + 7 = 16" should be "1 + 3 + 5 + 7 = 16".
- 32 Fig. 1.39: The d-blocks are labeled incorrectly: 4*d* should be 3*d*; 5*d* should be 4*d*; 6*d* should be 5*d*; 7*d* should be 6*d*.
- 43 Fig. 1.50: The electron configuration for nitrogen has an extra electron. Remove the down arrow in the lower configuration and one of the down arrows in the upper configuration.
- Fig. 1.52: The lower ion in the bismuth box: Sn should be Bi and Ti should be Tl (both places)
- 69 Structure 28: The S atom should have a lone pair of electrons.
- 80 Ex. 2.39: A carbon atom should be placed at the bottom of the first vertical line.
- 109 Figure legend 3.33, line 2: exchange "right" and "left".
- 119 Ex. 3.9(d): NO<sub>2</sub> should be NO<sub>2</sub><sup>-</sup> (the nitrite ion).
- Ex. 3.19, line 2: the formula for pyridine should be C<sub>5</sub>H<sub>5</sub>N.
- 149 Eq. 29, at top of page, the exponent for the term in parentheses: 1/2 should be 3/2.
- 207 Self-Test 6.3B, line 3: delete the minus sign (heat output has no sign).
- 209 Example 6.3 Solution: Move the label for part (b) down to "Step 1".
- 213 Self-Test 6.5B, line 2: "energy left the system as heat" should be "energy entered the system as heat".
- 260 Self-Test 7.11A: Answer should be +175.83 J·K<sup>-1</sup>·mol<sup>-1</sup>
- 277 Ex. 7.12, line 3: C<sub>2</sub>HOH<sub>3</sub> should be C<sub>2</sub>H<sub>4</sub>O.
- 340 Example 9.4: the answer should be 1.7 × 10<sup>6</sup>.
- 343 Self-Test 9.8A, line 2: "molar concentration" should be "partial pressure".

- 361 Ex. 9.82, last line:  $10^{-4}$  should be  $10^{24}$ .
- 459 Self-Test 12.8A: mercury should be lead in question. Answer should be “No, because lead lies above zinc in Table 12.1.”
- 479 Ex. 12.55, line 1: 9.0 kC should be 4.5 kC.
- 489 Figure legend 13.7, line 1: “rates” should be “initial rates”.
- 509 Fig. 13.23: The units for the  $x$ -axis should be  $10^3 \cdot \text{K}^{-1}$ .
- 609 Fig. 16.4: The Period 5 element in Group 7 should be Tc; the Period 5 element in Group 9 should be Rh.
- 644 16.27(d) The name of the element should be sodium bis(oxalato)diaqua.
- 667 Top two lines (in shaded box): 0.304 should be 0.0304.
- 718 Structures at top of page: the organic group in the diamine,  $(\text{CH}_2)_6$ , should be a benzene ring,  $\text{C}_6\text{H}_4$ , in two places.
- C1 L.2B, last line: “396 kg” should be “396 g”.
- C2 3.10B: The configuration of  $\text{O}_2^+$  should be  $\text{O}_2: \sigma_{2s}^2 \sigma_{2s}^{*2} \sigma_{2p}^2 \pi_{2p}^4 \pi_{2p}^{*1}$ .
- C3 MT3.1B: Answer is 363 pm.  
6.10B:  $\Delta n = 3/4$  mol, as the question refers to 1 mol Al. Therefore, the answer is  $3.37 \times 10^3$  kJ.
- C11 F.17: Percentages to four significant figures are ethene (85.63%) > heptane (83.91%) > propanol (59.96%).  
H.3(a): Na should be K (2 places)  
H.17(c) The correct equations are:  $\text{P}_4(\text{s}) + 3 \text{O}_2(\text{g}) \rightarrow \text{P}_4\text{O}_6(\text{s})$ ;  $\text{P}_4(\text{s}) + 5 \text{O}_2(\text{g}) \rightarrow \text{P}_4\text{O}_{10}(\text{s})$
- C12 K.1(b): NaS should be  $\text{Na}_2\text{S}$ .  
K.5(c): The answer is  $-2$ .
- C13 L.3(a): 507 should be 507.1  
1.9: Answer should be  $8.8236 \times 10^{-12}$  m, or 8.8236 pm.  
1.17:  $10^{-3}$  should be  $10^3$ .  
1.47: The correct answers are:  
a) -1, 0, +1  
b) -2, -1, 0, +1, +2  
c) -1, 0, +1

d) -3, -2, -1, 0, +1, +2, +3

C14 1.65(c): The answer should be  $[\text{Kr}]4d^{10}5s^25p^3$ .

1.69(b): The answer should be  $4s$ .

1.89: Add (a) N and S.

1.95: Answers should have two significant figures.

1.107: The equation should be  $\int_0^L \left(\frac{2}{L}\right) \sin^2\left(\frac{n\pi x}{L}\right) dx = 1$

2.31(c):  $\text{Tl}_2\text{O}_3$ .

C15 2.45(a) Second structure is missing a lone pair on the first O atom.

C16 2.75, line 1: Add a lone pair of electrons to the first N atom.

C18 3.3(b): Slightly less than  $120^\circ$ .

3.9(b): There are three bond angles of  $120^\circ$ .

3.9(d): bent is the same as angular.

3.11(b): Remove a lone pair of electrons from the Te atom. Answers are then  $\text{AX}_4\text{E}$ ,  $90^\circ$  and  $120^\circ$  Seesaw.

3.27(b) The O atom should have two lone pairs of electrons.

C19 3.49(c), line 2: "...because N is more electronegative and its orbitals are lower in energy.

3.65(d): The N atom should have a lone pair of electrons, not a single unbonded electron.

C20 3.75: The double arrows should be a single double-headed arrow.

3.81: The equation is:  $\Delta E = \frac{h^2}{8mN^2R^2} \left[ \left(\frac{N}{2} + 1\right)^2 - \left(\frac{N}{2}\right)^2 \right] = \frac{h^2(N+1)}{8mN^2R^2}$

C21 The answers should have only two significant figures.

4.89: The answer should be:  $f(10v_{\text{rms}}) / f(v_{\text{rms}}) = 100e^{-99Mv_{\text{rms}}^2/2RT}$

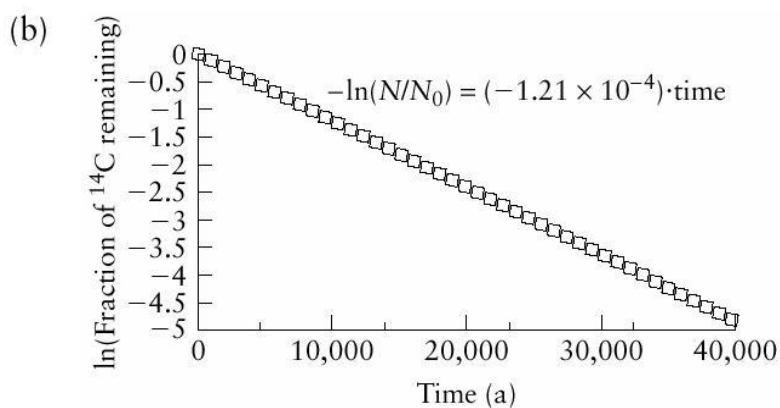
No, the distribution changes with temperature.

C22 5.65(c): Answer is pentane.

- 5.71: Add the equation  $r = \left[ (2.936 \times 10^5) M / d \right]^{1/3}$
- C23 6.19 Units should be  $\text{kJ} \cdot (\text{°C})^{-1}$
- 6.29 Answer has 3 significant figures.
- 6.39(b): The answer should be  $1.47 \times 10^3$  kJ.
- 6.41(a): 0.67 should be 19.2.
- 6.71(a): -1272 should be -597.
- 6.93(b):  $4.20 \times 10^3$  kJ.
- 6.95(a) -3.72 kJ
- 6.103, line 3: “6 more moles” should be “3 more moles”.
- C24 7.27(b) 1-pentene will have a higher entropy.
- 7.35: The heat capacities are constant-pressure heat capacities,  $C_{P,m}$
- 7.41(a): The answer has two significant figures.
- 7.67: Units for  $\Delta S_{\text{fus}}^\circ$  are  $\text{J} \cdot \text{K}^{-1}$ .
- C25 7.87:  $T$  should have 4 significant figures in each part.
- 8.15: Add (d) vapor.
- 8.49(a): 684 Torr
- C27 9.5 The answer should read:
- (a)  $K_c = \frac{[\text{COCl}][\text{Cl}]}{[\text{CO}][\text{Cl}_2]}$ ; (b)  $K_c = \frac{[\text{HBr}]^2}{[\text{H}_2][\text{Br}_2]}$ ; (c)  $K_c = \frac{[\text{SO}_2]^2[\text{H}_2\text{O}]^2}{[\text{H}_2\text{S}]^2[\text{O}_2]^3}$
- 9.87 The answer should read  $\ln \frac{K_{c2}}{K_{c1}} = -\frac{\Delta H_r^\circ}{R} \left( \frac{1}{T_1} - \frac{1}{T_2} \right) - \Delta n \ln \left( \frac{T_2}{T_1} \right)$
- 9.91(e): products; (f) no effect
- C28 9.107: Values on  $x$ -axis are 250, 300, and 350 K
- 10.23(b): answer has two significant figures: 0.010
- C29 10.53:  $\text{pH} = 4.21$ ;  $K_a = 6.2 \times 10^{-5}$

- 10.61(d) 11.056
- 10.67(a):  $1.8 \times 10^{-6}$
- 10.69(b) 6.11
- C30 10.97(a) and (b):  $1.00 \times 10^{-4} \text{ mol}\cdot\text{L}^{-6}$  should be  $1.00 \times 10^{-6} \text{ mol}\cdot\text{L}^{-1}$
- 10.99 8.5 should be 8.50; (a)  $7.37 \times 10^{-4}$  should be  $7.37 \times 10^{-6}$  (twice)
- 10.103(b): Add  $\Delta H^\circ = +54 \text{ kJ}\cdot\text{mol}^{-1}$ ,  $\Delta S^\circ = +87 \text{ J}\cdot\text{K}^{-1}\cdot\text{mol}^{-1}$
- 10.119, last line: 5.82 should be 5.75.
- 11.13(c): 11.6 should be 11.5
- 11.27: 79.5%
- 11.35: Thymol blue can also be used.
- C31 11.53(b)  $1.2 \times 10^{-16} \text{ mol}\cdot\text{L}^{-1}$ .
- 11.55(b)  $10^{-2}$  should be  $10^2$ .
- 11.81: 4.2 should be 4.35
- 11.87(a) The answer should be  $1.4 \times 10^{-5}$ ; (b) The answer should be 225 g.
- 11.97: The answer should be  $2.2 \times 10^{-3} \text{ mol}\cdot\text{L}^{-1}$ .
- 11.107(a): 5.1 should be 5.07
- 11.109(a) The answer should be  $3.5 \times 10^{-18}$ .
- C32 12.97 -0.27 V should be -0.21 V.
- 12.103(a) Insert a semicolon before “pOH”.
- C33 13.31 The intercept in the equation should have 3 significant figures.
- 13.51 The equation for the plot is  $y = -3.27 \times 10^3 x + 35.0$ .
- 13.53: 40 should be 39
- C34 13.61: The answers should be (a)  $1 \times 10^{13}$ ; (b)  $2 \times 10^{11}$ .
- C37 14.93(a): Correct the following values:  $\text{Cs}^+(5.88)$ ,  $\text{Rb}^+(6.71)$ ,  $\text{K}^+(7.25)$ ,  $\text{Na}^+(9.80)$ , ...  $\text{Ba}^+(14.7)$ ,  $\text{Sr}^+(17.2)$ ,  $\text{Ca}^{2+}(20.0)$ . (*Note that the ordering does not change.*)
- C40 16.45(f): 10

C44 17.81(a) y-axis label: C should be  $C^{14}$ . (b): Replace plot with the one below:



C47 18.71 The empirical formula is  $C_4H_9$ . The molecular formula might be  $C_8H_{18}$ . In the last line, 2.5 should be 2.25.

Corrections to the **first printing**:

83 Ex. 2.91, line 3 of table ( $Z = 16$ ), third column, 1 should be 0.

233 Example 6.11, Step 4: "Electron gain affinity of Cl" should be "Electron gain enthalpy of Cl"

705 Section 19.1, second paragraph, last line before equation: "hydrobromic acid" should be "bromide ion".

A13  $Pb^{2+}(aq)$ , Free energy of formation: "-14.43" should be "-24.43"

C12 The B with a sun icon in the center of each chemical equation should be replaced by an arrow.