Chemistry Release Notes 2017

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Page Count Difference:

In the latest edition of *Chemistry,* there are 1353 pages compared to the 1349 pages in the last edition. This page count variation is due to errata revisions.

Errata:

Below is a table containing submitted errata, and the resolutions that OpenStax has provided for this latest text.

Issue	Resolution	Severity
Chapter 1: Essential Ideas; End of Chapter Exercises In Chapter 1, question 90, there is a typo. 0.97 g/cm should be 0.97 g/cm^3.	Revise question 90 part (a) from "g/cm" to "g/cm^3" as follows: (a) What is the mass of 4.00 cm^3 of sodium, density = 0.97 g/cm^3?	Typo
Chapter 1.4: Essential Ideas, Section: Measurements Figure 1, showing the rulers is not representative of an actual ft/cm comparison. I'm not sure how the illusion was created, but the image clearly suggests that 1 ft is 30 cm. True, it's close, but the error is compounded by the point of 90 cm such that the 3-ft mark should match up with about 91.5 cm, not 90, which should be clearly visible. The problem is due to the fact that the 100 mark lines up with 40 cm, not 39.36. That may not seem like much, but it is enough. Measurements are important in chemistry, and so why not do it right?	Revise the ruler in Figure 1.23 to correctly show the alignment of centimeters and feet.	Minor
Chapter 1.4: Essential Ideas, Section: Measurements, End of Chapter Exercises In	Revise the answer to exercise 43 as follows: 43. Visit this PhET density simulation and select Mystery Blocks. ... (c) Order the Mystery Blocks	Typo

section 1.4 Measurements, there is an error in part c of the solution for the last exercise on the page. The solution given is "(c) B/blue/apple (0.64 kg/L) < C/green/gasoline (0.700 kg/L) < C/green/ice (0.920 kg/L) < D/red/diamond (3.53 kg/L) < A/yellow/gold (19.3 kg/L)" This makes no sense, because C/green cannot be both 0.700 kg/L and 0.920 kg/L. I believe the 3rd and 4th blocks are both identified incorrectly, and that the correct solution should be "(c) B/blue/apple (0.64 kg/L) < C/green/gasoline (0.700 kg/L) < D/red/ice (0.920 kg/L) < E/purple/diamond (3.53 kg/L) < A/yellow/gold (19.3 kg/L)".	from least dense to most dense. Explain. Answer: (c) B/blue/apple (0.64 kg/L) < C/green/gasoline (0.700 kg/L) < D/red/ice (0.920 kg/L) < E/purple/diamond (3.53 kg/L) < A/yellow/gold (19.3 kg/L)	
Chapter 1.5: Essential Ideas; Section 1.5: Measurement Uncertainty, Accuracy, and Precision; Subsection: Significant Figures in Calculations. Appears in text and Example 1.3 "lesser than 5" should be "less than 5"	Revise the paragraph before Example 1.3 Rounding Numbers to say "less than" instead of "lesser than".	Typo
Chapter 1.6: Essential Ideas, Section: Mathematical Treatment of Measurement Results, End of Chapter Exercises Question 77c and 77f: there is a "t" where I believe you mean x (times): (c) the area of an 8.5 t 11-inch sheet of paper in cm2 (e) the estimated mass of the atmosphere, 5.6 t 1015 tons, to kilograms	In parts (c) and (d) of exercise 77, revise "t" to a multiplication symbol as follows: 77. Make the conversion indicated in each of the following: (c) the area of an 8.5 c 11-inch sheet of paper in cm2 (e) the estimated mass of the atmosphere, 5.6 x 1015 tons, to kilograms	Typo
Chapter 2: Atoms, Molecules, and Ions, End of Chapter Exercises In chapter	Revise question 43 part (b) to delete extraneous "and" as follows: (b) the noble gas element with 75 neutrons in its nucleus and 54 electrons in the	Typo

2, question 43 part (b) there is a typo. Change "with and 75" to "with 75."	neutral atom	
Chapter 2: Atoms, Molecules, and Ions, End of Chapter Exercises, 25 In the answer to Problem 2.25, the fractional abundances are given when the percent abundances are what was asked for. revise “Turkey source: 0.2649 (of 10.0129 amu isotope); US source: 0.2537 (of 10.0129 amu isotope)” to “Turkey source: 26.49% (of 10.0129 amu isotope); US source: 25.37% (of 10.0129 amu isotope)”	In exercise 25, revise the fractional abundances given to percent abundances.	Minor
Chapter 2: Atoms, Molecules, and Ions, End of Chapter Exercises, 48 In Problem 48, revise “MgC2H3O2” to “Mg(C2H3O2)2	Revise part b of exercise 48 as follows: 48. For each of the following compounds, state whether it is ionic or covalent, and if it is ionic, write the symbols for the ions involved: (b) Mg(C2H3O2)2	Minor
Chapter 2: Atoms, Molecules, and Ions, End of Chapter Exercises, 59 In Problem 55, part b), revise “titanium dioxide” to “titanium(IV) oxide”	Revise part d of exercise 59 as follows: 59. The following ionic compounds are found in common household products. Write the formulas for each compound: (d) titanium(IV) oxide	Minor
Chapter 2.3: Atoms, Molecules, and Ions, Section: 2.3 Atomic Structure and Symbolism atomic mass (A) should be mass number (A)	Revise the fifth paragraph of section Atomic Structure and Function as follows: atomic number (Z) = number of protons mass number (A) = number of protons + number of neutrons A - Z = number of neutrons	Typo
Chapter 2.3: Atoms, Molecules, and Ions, Section: Atomic Structure and Symbolism, End of Chapter Exercises The solution guide incorrect uses (1+x) when it most likely means (1-x); though the answers provided are fine. Again, the problem is in the	Revise "1 + x" to "1 - x" in the solution of exercise 25.	Typo

Solutions Guide - not textbook.		
Chapter 2.3: Atoms, Molecules, and Ions; Section 2.3: Atomic Structure and Symbolism; Example 2.3 "atom of platinum" should be "ion of platinum."	Revise the Check Your Learning in Example 2.3 Composition of an Atom as follows: "An ion of platinum has a mass number of 195 and contains 74 electrons. How many protons and neutrons does it contain, and what is its charge?" (Previous: An atom of platinum...)	Typo
Chapter 2.5: Atoms, Molecules, and Ions, Section: The Periodic Table In the paragraph above Figure 3, the second-to-last sentence currently reads "Hydrogen is a unique, nonmetallic element with properties similar to both group 1A and group 7A elements." However, I think those group labels are from the old US system, no longer used in this text book. The old 1A is now 1, and the old 7A is now 17. Therefore, the last part of the second-to-last sentence should be changed to "properties similar to both group 1 and group 17 elements."	Revise the references to "group 1A" and "group 7A" to "group 1" and "group 17" respectively.	Minor
Chapter 2.6: Atoms, Molecules, and Ions; Section: 2.6 Molecular and Ionic Compounds; Subsection: Ionic Compounds Replace the phrase, "relative numbers of its constituent cations," with "relative numbers of its constituent ions."	Revise "constituent cations" to "constituent ions" in the last paragraph before section Molecular Compounds as follows: "Because an ionic compound... Instead, ionic compounds must be symbolized by a formula indicating the relative numbers of its constituent ions."	Typo
Chapter 2.6: Atoms, Molecules, and Ions; Section: 2.6 Molecular and Ionic Compounds; Subsection: Molecular Compounds; Example 2.12. The answer to part (d) of	Revise "group 1A" to "group 1" in the solution to Example 2.12 Predicting the Type of Bonding in Compounds part (d) as follows: (d) Lithium (group 1) is a metal, and carbonate is a polyatomic ion; Li2CO3 is predicted to be ionic.	Typo

Example 2.12 should read, "Lithium (group 1)" not "Lithium (group 1A)."		
Chapter 2.6: Atoms, Molecules, and Ions; Section: 2.6 Molecular and Ionic Compounds; Summary In the summary of section 2.6: Molecular and Ionic Compounds, "negatively charge ions" should be "negatively charged ions."		Typo
Chapter 2.7: Atoms, Molecules, and Ions, Section: Chemical Nomenclature, Chemistry in Everyday Life: Erin Brokovich and Chromium Contamination Error is found in the Chemistry in Everyday Life Box on Erin Brockovich in chapter 2. The caption for figure 2.32 states that "Erin Brockovich found that Cr(IV), used by PG&E, ..." The Roman numerals are reversed. It should be Cr(VI).	Revise "Cr(IV)" to "Cr(VI)" in the Chemistry in Everyday Life feature on Erin Brockovich.	Minor
Chapter 2.7: Atoms, Molecules, and Ions, Section: Chemical Nomenclature, Section Summary The last sentence of Key Concepts and Summary Chapter 2.7 it says "Oxyacids are named by changing the ending of the anion to –ic, and adding “acid;” H_2CO_3 is carbonic acid." I might add "or -ous" after -ic. So it would read Oxyacids are named by changing the ending of the anion to –ic or -ous, and adding “acid;” H_2CO_3 is carbonic acid.	Revise the last sentence of the summary as follows: "Oxyacids are named by changing the ending of the anion (–ate to –ic, and –ite to –ous) and adding “acid;” ...	Minor
Chapter 2.7: Atoms,	Revise "Cr^{4+}" to "Cr^{3+}" in the solution to	Typo

Molecules, and Ions; Section: 2.7 Chemical Nomenclature; Subsection: Compounds Containing a Metal Ion with a Variable Charge; Example 2.13. Cr^4+ should be Cr^3+ in the solution to Example 2.13.	Example 2.13 Naming Ionic Compounds as follows: ...the positive ions must be Fe3+, Cu2+, Ga3+, Cr3+, and Ti3+.	
Chapter 2.7: Atoms, Molecultes, and Ions Introduction Section: Chemical Nomenclature In table 2.9 on pg 108 (Names of Some Transition Metal Ionic Compounds), the first entry of the table is 'FeCl3', and the name given in the table is iron(II) chloride. It should be iron(III) chloride, as describe in the paragraph preceding the table.		Minor
Chapter 2.7: Atoms, Molecultes, and Ions Introduction Section: Chemical Nomenclature table 2.9 on page 108 in the orange chemistry book FeCl_3 was given the name iron(II) chloride chloride is a 1- charge, and if there is 3 of them, then the chlorine has a total 3- charge. therefore, Iron must carry a 3 minus charge to balance the compound. and there is only one iron, so that one element must carry the entire 3- charge. so the name of this compound should be iron(III) chloride This is major, the entire curriculum of chemistry is based on understanding nomenclature properly. This needs to be corrected asap.		Major
Chapter 3: Composition of Substances and Solutions,	Revise "concentration the" to "concentration of the" in question 60 as follows: 60. If 4.12 L of a	Typo

End of Chapter Exercises In question 60, "concentration the" should be "concentration of the".	0.850 M-H3PO4 solution is be diluted to a volume of 10.00 L, what is the concentration of the resulting solution?	
Chapter 3: Composition of Substances and Solutions; End of Chapter Exercises In Chapter 3, question 25, there is a typo. A1_2C1_6 and A1_2S_3 should be Al_2Cl_6 and Al_2S_3.	Revise the incorrect "1" to "l" in question 25 as follows: Al2Cl6 (not A12Cl6)	Typo
Chapter 3.1: Composition of Substances and Solutions, Section: Formula Mass and the Mole Concept p. 130 says CHCl3 is used to make Teflon. Isn't teflon a polymer made out of CF2=CF2?	Under the heading Formula Mass for Covalent Substances, revise the discussion of chloroform and Teflon as follows: "Consider chloroform (CHCl3), a covalent compound once used as a surgical anesthetic and now primarily used in the production of tetrafluoroethylene, the building block for the "anti-stick" polymer, Teflon."	Major
Chapter 3.1: Composition of Substances and Solutions, Section: Formula Mass and the Mole Concept, End of Chapter Exercises Chapter 3 Problem 25 Answer in the back of the book. The problems asks for greatest mass; however the answer provided is in moles (p.1263 2015; p.1261 2016)	Add the mass values to the solution for exercise 25 as follows: 25. Determine which of the following contains the greatest mass of aluminum: 122 g of AlPO4, 266 g of Al2C16, or 225 g of Al2S3. Answer: AlPO4: 1.000 mol, or 26.98 g Al Al2Cl6: 1.994 mol, or 53.74 g Al Al2S3: 3.00 mol, or 80.94 g Al The Al2S3 sample thus contains the greatest mass of Al.	Typo
Chapter 3.1: Composition of Substances and Solutions; Section 3.1: Formula Mass and the Mole Concept; Subsection: The Mole. In the caption to Figure 3.6, please change "454.9 g of HgI_2 (mercury(II) iodide, formula mass 459.9 amu)" to "454.4 g of HgI_2 (mercury(II) iodide, formula mass 454.4 amu)." The numbers must be the same + error in RFM.	Revise "454.9 g" to "454.4 g" in the caption for the second figure in section The Mole as follows: Clock-wise from the upper left... 454.4 g of HgI_2 (mercury(II) iodide, formula mass 454.4 amu).	Typo
Chapter 3.1: Composition of Substances and Solutions; Section 3.1: Formula Mass and the Mole Concept;	Revise "256.6 g" to "256.5 g" in the caption for the second figure in section The Mole as follows: Clock-wise from the upper left... 256.5 g of S_8 (sulfur, formula mass 256.5 amu).	Typo

Subsection: The Mole. In the caption to Figure 3.6, please change, "256.6 g of S_8 (sulfur, formula mass 256.6 amu)" to "256.5 g of S_8 (sulfur, formula mass 256.5 amu)."		
Chapter 3.1: Composition of Substances and Solutions; Section 3.1: Formula Mass and the Mole Concept; Subsection: The Mole. Please change the average atomic mass of Cl from 33.45 to 35.45.	Correct the average atomic mass of Cl from "33.45" to "35.45" in the table below the second figure in section The Mole.	Typo
Chapter 3.2: Composition of Substances and Solutions Section: Determining Empirical and Molecular FormulasThe answer to Example 3.13 has an error. The subscript for the final answer is 6 : (C5H7N)6 = C10H14N2 It should be 2: (C5H7N)2 = C10H14N2	Fixed.	Critical
Chapter 3.2: Composition of Substances and Solutions, Section: Determining Empirical and Molecular Formulas, End of Chapter Exercises p.167 Problem 33b The phrase: '(...) photographic "hypo" ' is perhaps not the best - or at the very least requires a few additional words of explanation. I developed film in the day - and I didn't readily pick up on what this meant. Many of my students think that it is a 'typo'. Maybe: 'the percent composition of sodium thiosulfate' Not really a typo - but I've seen this cause a lot of confusion with a number my students... They	Revise exercise 33 part (b) as follows: 33. Calculate the following to four significant figures: (b) the percent composition of photographic fixer solution (“hypo”), Na2S2O3	Unspecified

are the snapchat generation.		
Chapter 3.2: Composition of Substances and Solutions; Section 3.2: Determining Empirical and Molecular Formulas; Subsection: Derivation of Molecular Formulas. In Example 3.13 Determination of the Molecular Formula for Nicotine, include the calculations of molar ratios.	Include the calculations for the mole rations in Example 3.13 Determination of the Molecular Formula for Nicotine as follows: 6.163 mol C/1.233 mol N = 5 8.624 mol H/1.233 mol N = 7 1.233 mol N/1.233 mol N = 1	Typo
Chapter 3.2: Composition of Substances and Solutions; Section 3.2: Determining Empirical and Molecular Formulas; Subsection: Derivation of Molecular Formulas. In the solution to example 3.13, please change (C_5H_7_N)_6 to (C_5H_7_N)_2.	In the solution to example 3.13 Determination of the Molecular Formula for Nicotine, revise "C5H7N6" to "C5H7N2".	Typo
Chapter 3.3: Composition of Substances and Solutions, Section: Molarity, Example 3.16 On page 152, Example 3.16 indicates that the chemical formula for vinegar is CH2CO2H. It is not. The chemical formula for vinegar is HC2H3O2, commonly written as CH3COOH. Nobody writes the chemical formula 'CH2CO2H', or 'CH3CO2H' incorporating the correction. The molar mass of the compound is given correctly as 60.052 g/mol so no change is needed in the math.	Revise the formula for vinegar given in Example 3.16 Calculating Molar Concentrations from the Mass of Solute to "CH3CO2H".	Typo
Chapter 3.3: Composition of Substances and Solutions, Section: Molarity, Example: Calculating Molar Concentrations from the Mass of Solute Page 154,	In the solution to Example 3.16 Calculating Molar Concentrations from the Mass of Solute, revise the formula for acetic acid from "CH2CO2H" to "CH3CO2H".	Typo

example 3.16 Acetic acid's formula is written incorrectly in the worked out solution. "CH2CO2H" is listed 3 times in the formula and it should be "CH3CO2H".		
Chapter 3.3: Composition of Substances and Solutions; Section 3.3: Molarity; Subsection: Dilution of Solutions; Example 3.20. In the solution to Example 3.20, change the phrase, "four times the original concentrations," to "four times the original volume."	In the solution to Example 3.20 Volume of a Diluted Solution, revise "four times the original concentrations," to "four times the original volume."	Typo
Chapter 4: Stoichiometry of Chemical Reactions, End of Chapter Exercises Chapter 4, problem 71: The solution is H3PO4 is the limiting reactant, not Cr. In the solution manual (for the instructor) I see why there is a mistake: Openstax used 0.50 mol Cr, not 0.50 GRAMS in their calculation, then compared that to 0.75 mol H3PO4, not 0.75 GRAMS. H3PO4 is the limiting reactant	Revise exercise 71 as follows: 71. Outline the steps needed to determine the limiting reactant when 0.50 mol of Cr and 0.75 mol of H3PO4 react according to the following chemical equation.	Typo
Chapter 4: Stoichiometry of Chemical Reactions, End of Chapter Exercises Chapter 4, problem 81. The solution to this problem is wrong. The solution is 6.13 x 10^-3 M Cl-, not 9.6 x 10^-3 M Cl-. In the instructor's manual, I can see the source of the error. ** Openstax used 8.25 x 10-4 M in their calculation, not 5.25 x 10-4 M	Revise exercise 81 as follows: 81. ... What is the Cl- concentration in a 0.25-mL sample of normal serum that requires 1.46 mL of 8.25 × 10^-4 M Hg(NO3)2(aq) to reach the end point?	Minor
Chapter 4: Stoichiometry of Chemical Reactions, End of Chapter Exercises For	Insert a "+" between Cl^-(aq) and Ag^+(aq) in question 12 part ii, as follows: ii. Na+(aq) + Cl-(aq) + Ag+(aq) + NO3-(aq) --> AgCl(s) + Na+(aq) + NO3-	Typo

equation ii in question 12 of chapter 4, please insert a + between Cl^-(aq) and Ag^+(aq).	(aq)	
Chapter 4: Stoichiometry of Chemical Reactions, End of Chapter Exercises In question 49 of chapter 4, replace the phrase "from ores as" with "from ores such as."	Replace the phrase "from ores as" with "from ores such as" in question 4, as follows: 4. Silver is often extracted from ores such as K[Ag(CN)2] and...	Typo
Chapter 4: Stoichiometry of Chemical Reactions, End of Chapter Exercises Problem 11, reaction a), revise "BaC2O2(s)" to "BaC2O4(s)" Problem 12, revise "Use the following equations to answer the next five questions" to "Use the following five chemical equations to answer the next four questions"	Revise the instructions for exercises 12-15 as follows: "Use the following equations to answer the next four questions:"	Minor
Chapter 4: Stoichiometry of Chemical Reactions, End of Chapter Exercises, 3 Back of the book answer has a small typo: page 1262 of the 2016 ed, Chapter 4 Problem 3 F Reads: "(NH4)2Cr52O7(s)" Ought to read: "(NH4)2Cr2O7(s)" There's an extra '5'	In the solution to part f of exercise 3, revise the left half of the equation as follows: "(NH4)2Cr2O7"	Typo
Chapter 4: Stoichiometry of Chemical Reactions; Answer Key, Question 71 In the answer for question 71 in chapter 4, the formula H_2PO_4 should be H_3PO_4.	Revise the formula "H2PO4" to "H3PO4" in the answer to question 71, as follows: 71. The conversion needed is mol Cr --> mol H3PO4...	Typo
Chapter 4: Stoichiometry of Chemical Reactions; End of Chapter Exercises In question 78 of chapter 4, replace the phrase, "is be required to titrate," with "is	Replace the phrase, "is be required to titrate," with "is required to titrate" in question 78 as follows: 78. What volume of 0.0105-M HBr solution is required to titrate 125 mL of a 0.0100-M Ca(OH)2 solution?	Typo

required to titrate."		
Chapter 4: Stoichiometry of Chemical Reactions; End of Chapter Exercises In question 86 of chapter 4, the phrase, "in hot water of 60 °C is 164 g L" should be, "in hot water of 60 °C is 164 g/L."	Revise the phrase "in hot water of 60 °C is 164 g L" to "in hot water of 60 °C is 164 g/L" in question 86, as follows: 86. ...The solubility of NaHCO3 in hot water of 60 degrees C is 164 g/L...	Typo
Chapter 4: Stoichiometry of Chemical Reactions; End of Chapter Exercises The question, "What are the empirical and molecular formulas of the compound." should have a question mark instead of a period.	Add a question mark at the end of question 85.	Typo
Chapter 4.1: Stoichiometry of Chemical Reactions, Section: Writing and Balancing Chemical Equations, End of Chapter Exercises Chapter 4 Problem 7c page 1262: The answer given in the back of the book is: Al2O3(GAS) it should be a (SOLID).	Revise the answer given for part (d) of exercise 7 as follows: 7. Colorful fireworks often involve the decomposition of barium nitrate and potassium chlorate and the reaction of the metals magnesium, aluminum, and iron with oxygen.... Answer: (d) ...4Al(s) + 3O2(g) --> 2Al2O3(s)	Typo
Chapter 4.1: Stoichiometry of Chemical Reactions, Section: Writing and Balancing Chemical Equations, End of Chapter Exercises End of chapter exercises - Chapter 4 # 11 part a product listed as BaC2O2 (s); should be BaC2O4 (s)	Revise the formula given in part (a) of exercise 11 as follows: 11. From the balanced molecular equations, write the complete ionic and net ionic equations for the following: (a) K2C2O4(aq) + Ba(OH)2(aq) --> 2KOH(aq) + BaC2O4(s)	Typo
Chapter 4.1: Stoichiometry of Chemical Reactions, Section: Writing and Balancing Chemical Equations, End of Chapter Exercises p. 1262 Chapter 4 Problem 3 f The (NH4)2Cr52O7 ought to read (NH4)2Cr2O7. I think that	Revise "(NH4)2Cr52O7" to "(NH4)2Cr2O7" in the soltuion to exercise 3 part (f).	Typo

the extra 5 is a simple typo		
Chapter 4.1: Stoichiometry of Chemical Reactions; Section 4.1: Writing and Balancing Chemical Equations; Subsection: Balancing Equations. In the table that appears just before Example 4.1, 2 times 2 should equal 4 not 2.	In the table that appears just before Example 4.1 Balancing Chemical Equations, revise "2 x 2 = 2" to "2 x 2 = 4".	Typo
Chapter 4.1: Stoichiometry of Chemical Reactions; Section: Writing and Balancing Chemical Equations, first figure In the caption for Figure 4.2, change "carbon dioxide in water" to "carbon dioxide and water."	Revise "carbon dioxide in water" to "carbon dioxide and water" in the caption for the first figure in section 4.1 Writing and Balancing Chemical Equations as follows: The reaction between methane and oxygen to yield carbon dioxide and water (shown at bottom) may be represented by a chemical equation using formulas (top).	Typo
Chapter 4.2: Stoichiometry of Chemical Reactions Section: Classifying Chemical Reactions In Table 4.1, the ion ‘chromate’ is given the formula CrO32-, rather than CrO42-.	Fixed.	Minor
Chapter 4.2: Stoichiometry of Chemical Reactions; Section 4.2: Classifying Chemical Reactions; Subsection: Balancing Redox Reactions via the Half-Reaction Method; Example 4.7 In Step 4 for the Solution to Example 4.7, the last equation should read, "Cr_2O_7^2- + 14H^+ yields 2Cr^3+ + 7H_2O."	Add "14H+" to the last equation in the solution to Example 4.7 Balancing Redox Reactions in Acidic Solution as follows: Cr2O72- + 14H+ --> 2Cr3+ + 7H2O	Typo
Chapter 4.2: Stoichiometry of Chemical Reactions; Section 4.2: Classifying Chemical Reactions; Subsection: Oxidation-Reduction Reactions; Example 4.5 In the solution to Example 4.5, The	Revise "(3 x -1)" to "(3 x -2)" in the solution to Example 4.5 Assigning Oxidation Numbers part (b) as follows: (b)... charge on SO32- = -2 = (3 x -2) + (1 x X)	Typo

equation, "charge on SO_3^2- = -2 = (3 times -1) + (1 times x)" should read, "charge on SO_3^2- = -2 = (3 times -2) + (1 times x)."		
Chapter 4.2: Stoichiometry of Chemical Reactions; Section 4.2: Classifying Chemical Reactions; Subsection: Precipitation Reactions and Solubility Rules; Table 4.1 In Table 4.1, the charge for the sulfate ion should 2- not just -.	Revise the charge for the sulfate ion in Table 4.1 Solubilities of Common Ionic Compounds in Water from " - " to "2-"	Typo
Chapter 4.4: Stoichiometry of Chemical Reactions, Section: Reaction Yields, End of Chapter Exercises Chapter 4 problem 69: In the product side, ether is missing its Oxygen. Reads - 2C2H5OH + H2SO4 --> (C2H5)2 + H2SO4*H2O (C2H2)2 should be (C2H5)2	Revise the equation given in exercise 69 as follows: 69. Outline the steps needed to solve the following problem, then do the calculations... 2C2H5OH + H2SO4 --> (C2H5)2O + H2SO4 x H2O	Minor
Chapter 4.4: Stoichiometry of Chemical Reactions, Section: Reaction Yields, Example 4.16 Combustion Analysis Avogadro’s number on flowcart should be "stoichiometric factor"	Revise the flowchart in Example 4.16 Combustion Analysis to read "stoichiometric factor" instead of "Avogadro's number".	Typo
Chapter 4.4: Stoichiometry of Chemical Reactions, Section: Reaction Yields, Example 4.16 Combustion Analysis misleading to have y as the subscript in the formula CxHy(s) and also as the coefficient for H2O	In the solution to Example 4.16 Combustion Analysis, change "y" to "y/2" in front of H2O, as follows: CxHy(s) + excess O2(g) --> xCO2 + (y/2)H2O(g)	Typo
Chapter 4.4: Stoichiometry of Chemical Reactions; Section 4.4: Reaction Yields; Subsection: Limiting Reactant; Example 4.12 In the solution to Example 4.12, for the equation for	Revise "28.09 g N2" to "28.02 g N2" in the second equation in the solution to Example 4.12 Identifying the Limiting Reactant as follows: mol N2 = 1.50 g N2 x (1 mol N2/28.02 g N2) = 0.0535 mol N2	Typo

mol N_2, the denominator of the fraction should read "28.02 g N_2."		
Chapter 4.4: Stoichiometry of Chemical Reactions; Section 4.4: Reaction Yields; Subsection: Limiting Reactant; Example 4.13 In the Check Your Learning for Example 4.13 change the phrase, "of the Freon" to "of the Freon gas."	Revise "the Freon" to "the gas Freon" in the Check Your Learning question for Example 4.13 Calculation of Percent Yield as follows: What is the percent yield of a reaction that produces 12.5 g of the gas Freon CF2Cl2 from 32.9 g of CCl4 and excess HF?	Typo
Chapter 4.5: Stoichiometry of Chemical Reactions, Section: Quantitative Chemical Analysis, End of Chapter Exercises Ironically - the newer edition of the Chemistry book (orange) contains an error; whereas, the older edition does not. On p.221 of the latest edition, chapter 4 problem 81: The concentration given "(...) 5.25 × 10?4 M Hg(NO3)2(aq) to reach the end point?" Ought to read " (...) 8.25 (...)" in order to yield the computed value found in the back of the book. In the earlier edition, this was correct. Furthermore, in the solutions guide - the problem interchanges between these two numerical values (photo attached.)	In exercise 81, revise "5.25" to "8.25".	Minor
Chapter 4.5: Stoichiometry of Chemical Reactions, Section: Quantitative Chemical Analysis, End of Chapter Exercises p. 222 Chapter 4 Problem 83. The question talks about GaBr2 - however, it ought to read GaBr3.	In exercise 83, revise "GaBr2" to "GaBr3" throughout.	Typo

Chapter 4.5: Stoichiometry of Chemical Reactions, Section: Quantitative Chemical Analysis, Example 4.14 Perhaps the formula for Potassium permanganate should read KMnO4 instead of MnO4	Revise the Check Your Learning for Example 4.14 Titration Analysis as follows: "A 20.00-mL sample of aqueous oxalic acid, H2C2O4, was titrated with a 0.09113-M solution of potassium permanganate, KMnO4."	Minor
Chapter 4.5: Stoichiometry of Chemical Reactions; Section 4.5: Quantitative Chemical Analysis; Subsection: Titration; Example 4.14 In the Solution to Example 4.14, replace the phrase, "since the amounts of reactants are provided and requested are" with "since the amounts of reactants provided and requested are."	Revise "since the amounts of reactants are provided and requested are" to "since the amounts of reactants provided and requested are" in the Solution to Example 4.14 Titration Analysis as follows: As for all reaction stoichiometry calculations... since the amounts of reactants provided and requested are expressed as solution concentrations.	Typo
Chapter 5.1: Thermochemistry Section: Energy Basics Example 5.1, in the first equation, revise “Tfina” to “Tfinal”	Fixed	Typo
Chapter 5.1: Thermochemistry Section: Energy Basics In the equation for the heat, q, revise “(specific hea)” to “(specific heat)”	Fixed	Typo
Chapter 5.1: Thermochemistry, Section: Energy Basics, Example 5.1 Chapter 5, worked example 5.1 - computing the heat gain of water. The starting temperature in the problem is 21 deg C; however, in the solution - it is 20 deg C.	In the solution to Example 5.1 Measuring Heat, revise "20 degrees C" to "21 degrees C".	Typo
Chapter 5.2: Thermochemistry, Section: Calorimetry, Example 5.3 On page 239 of Chemistry Stax book. On the Check your	Revise the solution to the Check Your Learning in Example 5.3 Heat Transfer between Substances at Different Temperatures as follows: Answer The final temperature (reached by both copper and water) is 38.7 C.	Minor

learning problem number 2. The answer is for the final temp is incorrect.		
Chapter 5.2: Thermochemistry, Section: Calorimetry, Example 5.5 (p. 248 in hardback, Example 5.5). “When 50.0 mL of 0.10 M HCl(aq) and 50.0 mL of 0.10 M NaOH(aq),…” should both be 1.0 M. The problem ends up with -2.89 x 10^3 J for 0.0050 moles of reactant, giving -578 kJ/mol which is 10 x too big. Using the 1.0 M solutions gives 0.0500 moles of each reactant, giving -57.8 kJ/mol which is expected for this reaction. These numbers, 2.9 kJ and 0.0500 mol are used for the same reaction in problem 5.8.	Revise the first sentence of Example 5.5 Heat Produced by an Exothermic Reaction as follows: "When 50.0 mL of 1.00 M HCl(aq) and 50.0 mL of 1.00 M NaOH(aq), both at 22.0 degrees C..."	Major
Chapter 5.3: Thermochemistry, Section: Enthalpy, End of Chapter Exercises Chapter 5 End of Chapter Problem 49:: The question asks for the enthalpy of combustion. The answer in the back of the book is given as a positive value. However, per the convention of the book - this value ought to be negative. +++ https://docs.google.com/spreadsheets/d/1vj9AmOlmFJ9IbVM5YrSxxjqyYt71Er26YQY4J0sX7Rk/edit?usp=sharing	Revise the answer to exercise 49 to be negative, not positive.	Minor
Chapter 5.3: Thermochemistry, Section: Enthalpy, End of Chapter Exercises Chapter 5 Problem 66 The given eqn has a typo. Should read "CoO" but is instead written as "Co". The	Revise the second reaction given in exercise 66 as follows: 66. Calculate delta H degrees 298 for the process Co3O4(s) --> 3Co(s) + 2O2(g) from the following information: ... 3CoO(s) +12O2(g) --> Co3O4(s)	Typo

solution guide has it correct. +++		
Chapter 5.3: Thermochemistry, Section: Enthalpy, End of Chapter Exercises Chapter 5 Problem 69 d Problem stem read "Cs2" and ought read "CS2". Basically the sulfur needs to be in caps.	In exercise 69, capitalize "S" for sulfur.	Typo
Chapter 5.3: Thermochemistry, Section: Enthalpy, End of Chapter Exercises In the Thermochemistry chapter in the section on enthalpy there is a very good exercise that needs to have the reaction balanced. If you want the students to balance this reaction on their own, it would be good to point out they should check that the reaction is balanced. The exercise is pasted below. In the early days of automobiles, illumination at night was provided by burning acetylene, C2H2. Though no longer used as auto headlamps, acetylene is still used as a source of light by some cave explorers. The acetylene is (was) prepared in the lamp by the reaction of water with calcium carbide, CaC2: CaC2(s)+H2O(l)?Ca(OH)2(s)+ C2H2(g). Calculate the standard enthalpy of the reaction. The ?H?f of CaC2 is ?15.14 kcal/mol. The H2O in the reaction must be 2 H2O. This of course makes a big difference when doing ?H?f product - ?H?f reactant.	Revise exercise 77 to add a "2" in front of "H2O" as follows: 77. In the early days of automobiles, illumination at night was provided by burning acetylene, C2H2. Though no longer used as auto headlamps, acetylene is still used as a source of light by some cave explorers. The acetylene is (was) prepared in the lamp by the reaction of water with calcium carbide, CaC2: CaC2(s) + 2H2O(l) --> Ca(OH)2(s) + C2H2(g).	Typo

Chapter 5.3: Thermochemistry, Section: Enthalpy, Example 5.15 p. 261 e.g. 5.15 in the Alt Solution using the data from Appendix G. The oxygen in the third chemical reaction is not balanced. A 3 is needed as it's coeffienent (sp).	Revise the third equation given in the solution to Example 5.15 Using Hess's Law as follows: Solution: Supporting Why the General Equation Is Valid ... H2(g) + N2(g) + 3O2(g) --> 2HNO3(aq)	Typo
Chapter 5.3: Thermochemistry, Section: Enthalpy, Example 5.15 Using Hess's Law Example 5.14 and 5.15 in OpenStax- see attached files	Revise the third equation in Example 5.15 Using Hess's Law, Solution: Supporting Why the General Equation is Valid, as follows: H2(g) + N2(g) + 3O2(g) --> 2HNO3 (aq)	Typo
Chapter 6: Electronic Structure and Periodic Properties of Elements, End of Chapter Exercises, 53 In the answer to Problem 6.53, parts d) and e), revise "5s2" to "5s" "5p4" to "5p" "4d5" to "4d"	Revise the solution to exercise 53 parts d and e as follows: (d) "5s2" to "5s" "5p4" to "5p" (e) "4d5" to "4d"	Minor
Chapter 6: Electronic Structure and Periodic Properties of Elements; End of Chapter Exercises The phrase, ". . .described in Question 5," should be, ". . .described in Question 35."	Revise "Question 5" to "the previous question" as follows: 36. Which of the subshells described in the previous question contain degenerate orbitals? How many degenerate orbitals are in each?	Typo
Chapter 6.1: Electronic Structure and Periodic Properties of Elements, Section: Electromagnetic Energy, Example 6.3 Section 6.1, Check Yourself Problem 6.3 Calculate the threshold energy in kJ/mol of electrons in aluminum, given that the lowest frequency photon for which the photoelectric effect is observed is 9.87 × 1014 Hz. Answer: 3.94 × 105 kJ/mol should be 394 KJ/mol	Revise the solution of the Check Your Learning question in Example 6.3 Photoelectric Effect from "3.94 × 105 kJ/mol" to "3.94 kJ/mol".	Typo
Chapter 6.1: Electronic	Revise the solution given for exercise 9 in the	Typo

Structure and Periodic Properties of Elements, Section: Electromagnetic Energy, Solution Guide Solutions guide has a typo. p.2 of 5 for Chapter 6 Problem 9 a:: The freq used for the calculation is 7.9X10-7 sec; whereas it ought be be 3.45X1014. I think that this was a result of copy-paste from number 8.	solution guide to shown a frequency of "3.45 x 10^14" rather than "7.9 x 10^-7".	
Chapter 6.1: Electronic Structure and Periodic Properties of Elements; Section 6.1: Electromagnetic Energy; Subsection: Line Spectra The caption to Figure 6.12 should read, "This sign shows," not "This sign show."		Typo
Chapter 6.1: Electronic Structure and Periodic Properties of Elements; Section 6.1: Electromagnetic Energy; Subsection: Line Spectra The phrase, ". . .containing hydrogen gas at low pressure, the H_2 molecules are broken apart into separate H atoms, we see a blue-pink colour" should read, ". . .containing hydrogen gas at low pressure, the H2 molecules are broken apart into separate H atoms and we see a blue-pink colour."	Revise the third paragraph of Section Line Spectra to add the missing "and" as follows: For example... the H2 molecules are broken apart into separate H atoms, and we see a blue-pink color.	Typo
Chapter 6.1: Electronic Structure and Periodic Properties of Elements; Section 6.1: Electromagnetic Energy; Subsection: The Photoelectric Effect; Example 6.3 In Example 6.3, the question should direct students to change the	Revise the phrase "changed the underlined word" with "change the italicized word" in Example 6.3 Photoelectric Effect as follows: Identify which of the following statements are false and, where necessary, change the italicized word or phrase to make them true, consistent with Einstein's explanation of the photoelectric effect.	Typo

italicized word(s), not the underlined words.		
Chapter 6.3: Electronic Structure and Periodic Properties of Elements Section: Development of Quantum Theory Problem 36, revise “described in Question 5 contain” to “described in Question 35 contain”	Fixed	Minor
Chapter 6.3: Electronic Structure and Periodic Properties of Elements Section: Development of Quantum Theory Problem 38, revise “described in Question 7 contain” to “described in Question 37 contain”	Fixed	Minor
Chapter 6.3: Electronic Structure and Periodic Properties of Elements The word principal in the phrase "principal quantum number" is misspelled in a few locations in chapter 6. The adjective should be "principal" and not "principle," on as on page 298.	Revise all instances of "principle quantum number" to "principal quantum number".	Minor
Chapter 6.3: Electronic Structure and Periodic Properties of Elements; Section 6.3: Development of Quantum Theory; Question 38 The phrase, ". . .described in Question 7," should be, ". . .described in Question 37."	Revise "Question 7" to "the previous question" as follows: 38. Which of the subshells described in the previous question contain degenerate orbitals? How many degenerate orbitals are in each?	Typo
Chapter 6.3: Electronic Structure and Periodic Properties of Elements; Section 6.3: Development of Quantum Theory; Subsection: The Pauli Exclusions Principle;	Revise the phrase "1 orbitals labeled 5s" to "1 orbitals labeled 5s" in Example 6.8 Maximum Number of Electrons.	Typo

Example 6.8 The phrase, "1 orbitals labeled 5s," should be, "1 orbitals labeled 5s."		
Chapter 6.3: Electronic Structure and Periodic Properties of Elements; Section 6.3: Development of Quantum Theory; Subsection: Understanding Quantum Theory of Electrons in Atoms In the equation on pg. 316, "E_fina" should be "E_final."	Revise "E_fina" to "E_final" in the equation in Section Behavior in the Microscopic World, as follows: deltaE = E_final - E_initial	Typo
Chapter 6.3: Electronic Structure and Periodic Properties of Elements; Section 6.3: Development of Quantum Theory; Subsection: Understanding Quantum Theory of Electrons in Atoms The phrase, "In the case of a hydrogen atom or a one electron ion (such as He^+, Li^+ and . . .," should read, "In the case of a hydrogen atom or a one electron ion (such as He^+, Li^2+ and . . ."	Revise the phrase "In the case of a hydrogen atom or a one electron ion (such as He+, Li+ and..." to "In the case of a hydrogen atom or a one electron ion (such as He+, Li2+ and...".	Typo
Chapter 6.3: Electronic Structure and Periodic Properties of Elements; Section 6.3: Development of Quantum Theory; Subsection: Understanding Quantum Theory of Electrons in Atoms The phrase, "the energy of an electron in atom," should be, "the energy of an electron in an atom."	Revise the second paragraph in Section Understanding Quantum Theory of Electrons in Atoms to add the missing "an" as follows: Generally speaking, the energy of an electron in an atom is greater for greater values of n.	Typo
Chapter 6.4: Electronic Structure and Periodic Properties of Elements, Section: Electromagnetic Energy, Figure 6.11 Caption	Revise the caption of Figure 6.11 as follows: "Photons with low frequencies do not have enough energy to cause electrons to be ejected via the photoelectric effect. For any frequency of light above the threshold frequency, the kinetic	Minor

for figure re. photoelectric effect erroneously states electron kinetic energies are "proportional to" photon energies, recommend revision as shown below to correct this error and an presently: "...the kinetic energy of ejected electron will be proportional to the energy of the incoming photon..." change to: "... the kinetic energy of an ejected electron will increase linearly with the energy of the incoming photon..."	energy of an ejected electron will increase linearly with the energy of the incoming photon."	
Chapter 6.4: Electronic Structure and Periodic Properties of Elements; Section 6.4: Electronic Structure of Atoms (Electron Configurations); Subsection: Electron Configurations and the Periodic Table The phrase, ". . . are most easily lost or shared than the core electrons," should be, ". . . are more easily lost or shared than the core electrons."	Revise the phrase "...are most easily lost or shared than the core electrons," to "...are more easily lost or shared than the core electrons" in the first paragraph of Section Orbital Energies and Atomic Structure.	Typo
Chapter 6.5: Electronic Structure and Periodic Properties of Elements, Section: Periodic Variations in Element Properties, End of Chapter Exercises In the solutions guide for Chapter 2 problem 49 b; the answer given incorrectly lists the carbonate and ought to be the sulfate. See attached pic.	In the Solution Manual, revise the solution given for exercise 49 part (b) as follows: (b) (NH4)2SO4	Typo
Chapter 7: Chemical Bonding and Molecular Geometry; Answer key; End of Chapter Exercises The solution for part (a) to question 55 in chapter 7: Chemical Bonding	Add the text "(a)" to the first solution given for question 55.	Typo

and Molecular Geometry is missing.		
Chapter 7: Chemical Bonding and Molecular Geometry; End of Chapter Exercises Choice (b) in Question 32 in Chapter 7 should read, "ICl_4^-."	Revise "IC4-" to "ICl4-" in question 32 part (b).	Typo
Chapter 7: Chemical Bonding and Molecular Geometry; End of Chapter Exercises The question, "Which of the molecules and ions in Exercise 7.93 contain polar bonds?" should read, "Which of these molecules and ions contain polar bonds?" Since the reference to 7.93 is irrelevant.	Delete the reference to Exercise 7.93 in question 98.	Typo
Chapter 7.1: Chemical Bonding and Molecular Geometry, Section: Ionic Bonding, Figure 7.3 figure 7.3, the labeling is wrong, larger spheres are labeled Na+, smaller spheres Cl-	In part b of Figure 7.3, reverse the labels Na+ and Cl-.	Typo
Chapter 7.3: Chemical Bonding and Molecular Geometry; Section 7.3: Lewis Symbols and Structures; Subsection: Odd-electron Molecules The phrase, "we follow the same six steps we would for," should be, "we follow the same five steps we would for."	Revise the phrase "we follow the same six steps" to "we follow the same five steps" in the second paragraph of Section Odd-electron Molecules.	Typo
Chapter 7.5: Chemical Bonding and Molecular Geometry, Section: Strengths of Ionic and Covalent Bonds, Table 7.4 I don't know if I am just misunderstanding, or if this is an actual error - Table 7.4 on page 367 of the textbook	Revise Table 7.4 to show the enthalpy of formation for cesium fluoride.	Minor

is supposed to show the enthalpy of formation for cesium chloride, but there is information in the table for the formation of sodium chloride.		
Chapter 7.6: Chemical Bonding and Molecular Geometry, Section: Molecular Structure and Polarity On page 379 of the OpenStax chemistry text, the diagram for Chloromethane, as well as the corresponding wording in the text, are incorrect. The dipole moment arrows for the bonds are all pointing in the wrong direction. They should be pointing from the more positive element to the more negative element. The wording should state "All of the dipoles have an 'UPWARD' component..."	In the sentence before the VSEPR model of Chloromethane, revise "downward component" to "upward component".	Typo
Chapter 7.6: Chemical Bonding and Molecular Geometry, Section: Molecular Structure and Polarity, Example 7.16 Example 7.16, revise The Lewis structure in the solution has a minor error. One of the oxygens is missing a couple of lone pairs of electrons.	Add a pair of electrons to the Oxygen in the first figure of the solution to Example 7.16.	Minor
Chapter 7.6: Chemical Bonding and Molecular Geometry; Section 7.6: Molecular Structure and Polarity; Subsection: Molecular Polarity and Dipole Moment On page 397, there is no C-S dipole. Change the diagram which shows a dipole.	Revise the paragraph that follows the figure labeled "bond movements" and "overall dipole moment" as follows: The C-O bond is considerably polar. Although C and S have very similar electronegativity values, S is slightly more electronegative than C, and so the C-S bond is just slightly polar. Because oxygen is more electronegative than sulfur, the oxygen end of the molecule is the negative end. (Previous: Although the C–O bond is polar, C and S have the same electronegativity values as shown in Figure	Typo

	7.6, so there is no C–S dipole. Thus, the two bonds do not have of the same bond dipole moment, and the bond moments do not cancel. Because oxygen is more electronegative than sulfur, the oxygen end of the molecule is the negative end.)	
Chapter 7.6: Chemical Bonding and Molecular Geometry; Section 7.6: Molecular Structure and Polarity; Subsection: Molecular Polarity and Dipole Moment The phrase, "Thus, the two bonds do not have of the same bond dipole moment and . . .," should be, "Thus, the two bonds do not have the same bond dipole moment and . . ."	Delete "of" in the fifth paragraph of Section VSEPR Theory as follows: Thus, the two bonds do not have the same bond dipole moment...	Typo
Chapter 8.1: Advanced Theories of Covalent Bonding, Section: Valence Bond Theory On page 405 of the most recent version of 'Chemistry', there is a mangled sentence, see attached screen shot	Delete the extraneous "in" in the following sentence as shown: "As the Lewis structures suggest, O2 contains a double bond, and N2 contains a triple bond."	Minor
Chapter 8.1: Advanced Theories of Covalent Bonding, Section: Valence Bond Theory, Example 8.1 The formula for Butadiene is listed as C6H6 in example 8.1 on page 417. The correct formula for Butadiene is C4H6.	Revise the formula given for Butadiene in Example 8.1 Counting Sigma and Pi Bonds to "C4H6".	Major
Chapter 8.2: Advanced Theories of Covalent Bonding, Section: Hybrid Atomic Orbitals The description of the orbitals (see Figure legend, in terms of color, in Fig. 8.8 is confusing/wrong. The p-orbital is not 'red', nor are	In Figures 8.8, 8.10, and 8.15, revise the captions to say "yellow" instead of "purple".	Major

the hybrid orbitals 'purple'. I know that we went through various iterations of these colorings, but the figure legends must of course match the figures. The same discrepancy occurs in other figures in this chapter, e.g. Figs. 8.10 and 8.15.		
Chapter 8.2: Advanced Theories of Covalent Bonding, Section: Hybrid Atomic Orbitals, Figure 8.10 Figure 8.10 showing the hybridization of orbitals to form sp2 orbitals. The figure shows the sp2 orbitals arranged 90 degrees from each other, rather than 120 degrees in a plane. This is very confusing for students!	Add a label to Figure 8.10 to mark the 120 degrees between the sp2 orbitals.	Major
Chapter 8.4: Advanced Theories of Covalent Bonding Section: Molecular Orbital Theory The caption reads: "from the valance band to the conduction band." Please correct the spelling.	fixed valance to valence -yingyan	Typo
Chapter 8.4: Advanced Theories of Covalent Bonding, Section: Molecular Orbital Theory, Subsection: Bonding in Diatomic Molecules "When a single p orbital contains a pair of electrons, the act of pairing the electrons raises the energy of the orbital. Thus the 2p orbitals for O, F, and Ne are higher in energy than the 2p orbitals for Li, Be, B, C, and N." The electrons in the 2p orbitals of O, F, and Ne are not higher in energy than those of Li, Be, B, C, and N. This statement is	Revise the paragraph after Figure 8.38 (MO patterns) as follows: "s-p mixing occurs when the s and p orbitals have similar energies. The energy difference between 2s and 2p orbitals in O, F, and Ne is greater than that in Li, Be, B, C, and N. Because of this, O2, F2, and Ne exhibit negligible s-p mixing..."	Major

much too overgeneralized and leads to a gross misunderstanding of how to think about atomic energy levels and the consequent effects of combining them. The only case where double occupancy increases the apparent energy is evidenced by the slightly lower IE1 of O compared to that of N. The second ionization energy of O, however, is much greater than that of N, which means that the 2p orbital electrons of O are not all at a higher level. Further, and perhaps more germane is that IE1 of F and Ne are both greater than that of N so this makes the statement quoted above false, as IE1 clearly indicates that the singly occupied 2p orbitals of N are at a higher energy level than the doubly occupied 2p orbitals of F and Ne. The correct explanation for this difference in s and p energy levels is that as effective nuclear charge becomes stronger, there is an increased separation/difference in the energy levels of 2s and 2p electrons. This is the better explanation for the observations of O where even though the double occupancy leads to a higher IE1 as compared to N with its singly occupied 2p orbitals (suggesting double occupancy leads to higher energy), the 2s electrons of O are at a much lower energy level than the 2s		

electrons of N, thus there is too big of an energy gap between those electrons for mixing to occur. This energy gap increases for elements to the right of O as their Zeffective also increases. Conversely, the 2s and 2p energy levels of N and all 2nd period elements prior to exhibit decreasingly smaller gaps between 2s and 2p moving to the left across the period just as Zeff decreases.		
Chapter 9: Gases, End of Chapter Exercises, 11 p. 502 Chapter 9 Problem 11. The question stem reads: "(...) pressure at sea level 29.97 in., (...)" Ought to read: "(...) pressure at sea level 29.97 in. Hg, (...)" Basically missing the "Hg"	In exercise 11, revise "29.97 in." to "29.97 in. Hg".	Typo
Chapter 9: Gases, End of Chapter Exercises, 25 Chapter 9 Problem 25 page 504 (2016 ed). Using the figure mentioned in the problem, one cannot (at the given temperature) get the answer that is showing in the back of the book. Either change the temperature to 191K or adjust the volume of the answer.	Revise the solution to exercise 25 as follows: 25. Determine the volume of 1 mol of CH4 gas at 150 K and 1 atm... Solution About 12.2 L	Typo
Chapter 9: Gases, End of Chapter Exercises, 69 Missing a "K" on page 507 (2016 ed) Chapter 9 Problem 69 A. Reads "875 degree" should read "875 K" (without the degree and Kelvin added.)	Revise part a of exercise 69 to give temperature "875 K".	Minor
Chapter 9: Gases; Answer Key The answer to question 105 part (b) in chapter 9	Revise the answer to part (b) of question 105 to use "ideal gas equation" instead of "van der Waals equation" as follows: (b) When real gases	Typo

currently reads, "the ideal gas approximation breaks down and is significantly different from the pressure calculated by the van der Waals equation," but it should read, "the ideal gas approximation breaks down and is significantly different from the pressure calculated by the ideal gas equation ..."	are at low pressures and high temperatures... the ideal gas approximation breaks down and is significantly different from the pressure calculated by the ideal gas equation.	
Chapter 9.1: Gases, Section: Gas Pressure Chemistry text: 1) P464 fig 9.5 - diagram on right has incorrect depiction of "h" submitted via ZenDesk	In Figure 9.5 on manometers, revise the label of h on the rightmost manometer to appear above the black line.	Minor
Chapter 9.2: Gases, Section: Relating Pressure, Volume, Amount, and Temperature: The Ideal Gas Law Chapter 9 Figure 5 has the wrong units on the vertical axis. They should be psi^-1, not psi	Revise the graph in Figure 9.13 to have units of psi^-1.	Minor
Chapter 9.2: Gases, Section: Relating Pressure, Volume, Amount, and Temperature: The Ideal Gas Law Chapter 9 Figure 6, graph on right, axes are incorrectly labeled. This is a graph of 1/P vs. V, not Volume vs. Pressure. But there is probably a simpler solution. The graphs in this figure are a duplication of those in Figure 5, and the Figure 5 graphs are much nicer. The text can simply refer to Figure 5.	Revise part (b) of Figure 9.14 showing the relationship between pressure and volume to show the graph of 1/P vs. V.	Major
Chapter 9.2: Gases; Section 9.2: Relating Pressure, Volume, Amount, and Temperature: The Ideal Gas Law; Subsection: Volume and Pressure: Boyle's Law In Example 9.8, the phrase,	Revise the phrase "Using P1 and V1 as the known values 0.933 atm and 2.40 mL" to "Using P1 and V1 as the known values 13.0 psi and 15.0 mL" in the solution to Example 9.8 Volume of a Gas Sample, as follows: (c) From Boyle's law... Using P1 and V1 as the known values 13.0 psi and 15.0 mL, P2 as the pressure at which the volume is	Typo

"Using P_1 and V_1 as the known values 0.933 atm and 2.40 mL, P_2 as the volume at which the pressure is unknown and V_2 as the unknown volume," should read, "Using P_1 and V_1 as the known values 13.0 psi and 15.0 mL, V_2 as the volume at which the pressure is unknown and P_2 as the unknown pressure..."	unknown, and V2 as the unknown volume, we have...	
Chapter 9.2: Gases; Section 9.2: Relating Pressure, Volume, Amount, and Temperature: The Ideal Gas Law; Subsection: Volume and Pressure: Boyle's Law In Figure 9.14, the graph of P vs. V is a parabola, but the graph of P vs. V should be a hyperbola.	Revise "parabola" to "hyperbola" in the figure caption for Figure 9.14 on the relationship between pressure and volume.	Typo
Chapter 9.2: Gases; Section 9.2: Relating Pressure, Volume, Amount, and Temperature: The Ideal Gas Law; Subsection: Volume and Temperature: Charles's Law The phrase, "and as seen with the V-T relationship, this leads to another form of Charles's law," should be, "and as seen with the P-T relationship, this leads to another form of Charles's law."	Revise "V-T relationship" to "P-T relationship" in the paragraph before Example 9.6 Predicting Change in Volume with Temperature as follows: For a confined, constant pressure gas sample, V/T is constant (i.e., the ratio = k), and as seen with the P-T relationship, this leads to another form of Charles's law: V1/T1 = V2/T2.	Typo
Chapter 9.3: Gases Section: Stoichiometry of Gaseous Substances, Mixtures, and Reactions There are several errors in the Student solutions for Chapter 9 of the Chemistry text book. These are some basic problems that students are	Revise the solutions to exercises 37, 57, and 79 in the solution manual.	Major

using as their go to practice. It is important that they are corrected quickly. The errors are in problems #37, #57, #79. Additionally the answer to Check your Learning Example 9.16 is incorrect in the online version, but correct in the paper version. Has the on-line version not been updated? Thanks much.		
Chapter 9.3: Gases, Section: Stoichiometry of Gaseous Substances, Mixtures, and Reactions, Example 9.11 "g/L" is not density "rho" m/V (mass over volume) is rho Please do not use units in a mathematical expression as though they were variables.	Revise Example 9.11 Derivation of a Density Formula from the Ideal Gas Law as follows: In Step 4 of the solution, change “g/L” to “m/V".	Minor
Chapter 9.3: Gases; Section 9.3: Stoichiometry of Gaseous Substances, Mixtures, and Reactions; Subsection: Avogadro's Law Revisited; How Sciences Interconnect feature CH_3 as greenhouse gas should be CH_4.	Revise the figure in feature "How Sciences Interconnect: Greenhouse Gases and Climate Change" as follows: Correct CH_3 to CH_4. Add O_3.	Typo
Chapter 9.3: Gases; Section 9.3: Stoichiometry of Gaseous Substances, Mixtures, and Reactions; Subsection: Collection of Gases over Water The answer to the Check Your Learning for Example 9.16 should be 0.583 L since the question asks for volume.	Revise the answer to the Check Your Learning for Example 9.11 Derivation of a Density Formula from the Ideal Gas Law from "734 torr" to "0.583 L" as follows:	Typo
Chapter 9.3: Gases; Section 9.3: Stoichiometry of Gaseous Substances, Mixtures, and Reactions; Subsection: The Pressure of	Add the missing "were" into the first paragraph of subsection The Pressure of a Mixture of Gases: Dalton’s Law, as follows: Each individual gas in a mixture exerts the same pressure that it would exert if it were present alone in the container	Typo

a Mixture of Gases: Dalton's Law The phrase, "exerts the same pressure that it would exert if it present alone in the container," should read, "exerts the same pressure that it would exert if it were present alone in the container."	(Figure 9.20).	
Chapter 9.3: Gases; Section 9.3: Stoichiometry of Gaseous Substances, Mixtures, and Reactions; Subsection: The Pressure of a Mixture of Gases: Dalton's Law The phrase, "total number of moles of all components):" has an unnecessary bracket.	Delete the unnecessary bracket at the end of the phrase "total number of moles of all components:".	Typo
Chapter 9.4: Gases Section: Effusion and Diffusion of Gases In the first equation, for the rate of diffusion, revise “rate of diffusio = “ to “rate of diffusion = “	Fixed	Typo
Chapter 9.4: Gases Section: Effusion and Diffusion of Gases In the second equation, for the rate of effusion, revise “rate of effusio “ to “rate of effusion “		Typo
Chapter 9.4: Gases; Section 9.4: Effusion and Diffusion of Gases The equation in Example 9.22 should read, "rate of effusion of unknown" over "rate of effusion of CO_2."	Revise "O2" to "CO2" in the equation in Example 9.22 as follows: rate of effusion of unknown/rate of effusion of CO2	Typo
Chapter 9.4: Gases; Section 9.4: Effusion and Diffusion of Gases The equation that appears before Figure 9.29 should read "rate of effusion of B" over "rate of effusion of A."	Revise the equation before Figure 9.29 so that "A" and "B" aren't cut off, as follows: rate of effusion of B/rate of effusion of A	Typo

Chapter 9.5: Gases, Section: The Kinetic-Molecular Theory, Subsection: Molecular Velocities and Kinetic Energy the appropriate form of the gas constant is 8.314 J/K (8.314 kg m2s–2K–1) is missing a "per mole" in the definition of R and should be instead: the appropriate form of the gas constant is 8.314 J/mol-K (8.314 kg m2s–2mol-1K–1)	Revise the last paragraph of subsection Molecular Velocities and Kinetic Energy as follows: "...When used in this equation, the appropriate form of the gas constant is 8.314 J/mol x K (8.314 kg m^2s^-2mol^-1K^-1)."	Typo
Chapter 9.5: Gases; Section 9.5: The Kinetic-Molecular Theory; Subsection: The Kinetic-Molecular Theory Explains the Behavior of Gases, Part 1 Part of the caption for Figure 9.31 currently reads, "(b) When volume decreases, gas pressure increases due to reduced frequency of molecular collisions." However, it should read, "(b) When volume decreases, gas pressure increases due to increased frequency of molecular collisions."	Revise "reduced" to "increased" in part (b) of the caption of the figure before subsection Molecular Velocities and Kinetic Energy, Figure 9.31, as follows: (b) When volume decreases, gas pressure increases due to increased frequency of molecular collisions.	Typo
Chapter 9.5: Gases; Section 9.5: The Kinetic-Molecular Theory; Subsection: The Kinetic-Molecular Theory Explains the Behavior of Gases, Part 1 Part of the caption for Figure 9.31 currently reads, "(c) When the amount of gas increases at a constant pressure, volume increases to yield a constant number of collisions per unit wall area." However, it should read, "(c) When the amount of gas increases at a constant pressure, volume increases	Add the phrase "per unit time" to part (c) of the caption of the figure before subsection Molecular Velocities and Kinetic Energy, Figure 9.31, as follows: (c) When the amount of gas increases at a constant pressure, volume increases to yield a constant number of collisions per unit wall area per unit time.	Typo

to yield a constant number of collisions per unit wall area per unit time."		
Chapter 9.5: Gases; Section 9.5: The Kinetic-Molecular Theory; Subsection: The Kinetic-Molecular Theory Explains the Behavior of Gases, Part 1 The explanation of Charles's law says, "If the temperature of a gas is increased, a constant pressure can be maintained only if the volume occupied by the gas increases. This will result in greater average distances traveled by the molecules to reach the container walls, as well as increased wall surface area. These conditions will decrease both the frequency of molecule-wall collisions and the number of collisions per unit area, the combined effects of which outweigh those of increased collision forces due to the greater kinetic energy at the higher temperature. The net result is a decrease in gas pressure." This is a confused explanation with “constant pressure” and “decrease in gas pressure." Suggest something like: "If the temperature of a gas is increased, a constant pressure can be maintained only if the volume occupied by the gas increases. This will result in greater average distances traveled by the molecules to reach the container walls, as well as increased wall surface area. These conditions will	Revise the description of Charles's law as follows: Charles’s law. If the temperature of a gas is increased... These conditions will decrease the both the frequency of molecule-wall collisions and the number of collisions per unit area, the combined effects of which balance the effect of increased collision forces due to the greater kinetic energy at the higher temperature. (Previous: Charles’s law. If the temperature of a gas is increased... These conditions will decrease the both the frequency of molecule-wall collisions and the number of collisions per unit area, the combined effects of which outweigh those of increased collision forces due to the greater kinetic energy at the higher temperature. The net result is a decrease in gas pressure.)	Typo

decrease both the frequency of molecule-wall collisions and the number of collisions per unit area, the combined effects of which will balance those of increased collision forces due to the greater kinetic energy at the higher temperature. The net result is a constant gas pressure."		
Chapter 9.5: Gases; Section 9.5: The Kinetic-Molecular Theory; Subsection: The Kinetic-Molecular Theory Explains the Behavior of Gases, Part 1 The phrase, "will decrease the both the frequency," should read, "will decrease both the frequency."	Fixed.	Typo
Chapter 9.6: Gases; Section 9.6: Non-Ideal Gas Behavior; Summary In the summary for Section 9.6: Non-Ideal Gas Behavior, the phrase, "non-ideal behavior of gases under conditions," should read, "non-ideal behavior of gases under these conditions."	Add the missing word "these" in the last sentence of the summary for Section 9.6 Non-Ideal Gas Behavior as follows: The van der Waals equation is a modified version of the ideal gas law that can be used to account for the non-ideal behavior of gases under these conditions.	Typo
Chapter 10: Liquids and Solids, End of Chapter Exercises, 29 The last exercise question in chapter 10.2 asks "Water rises in a glass capillary tube to a height of 17 cm. What is the diameter of the capillary tube?". The solution is 9.5 x 10^-5 m. If my calculations are correct, that is the radius not the diameter length.	Revise the solution to exercise 29 as follows: 29. Water rises in a glass capillary tube to a height of 17 cm... Solution 1.9 x 10^-4 m	Typo
Chapter 10: Liquids and Solids; Answer Key; Question 19 Part of the answer to question 19 in chapter 10	Revise "DNA strands" to "protein strand" in the answer to question 19.	Typo

reads, "H-bonding is the principle intermolecular force holding the DNA strands together," but it should read, "H-bonding is the principle intermolecular force holding the protein strand in this shape."		
Chapter 10: Liquids and Solids; Answer Key; Question 63 The solution to question 63 parts (a) and (d) in chapter 10 reference water, but it should be carbon.	Revise "water" to "carbon" in the phase diagram solutions to question 63.	Typo
Chapter 10: Liquids and Solids; End of Chapter Exercises; Question 63 Question 63 of chapter 10 states that carbon has, "three different solid phases," but the diagram only shows 2.	Revise "three" to "two" in question 63 as follows: 63. Elemental carbon has one gas phase, one liquid phase, and two different solid phases...	Typo
Chapter 10.1: Liquids and Solids; Section 10.1: Answer Key; Question 7 Part of the answer to question 7 part (c) of chapter 10 reads, "Hydrogen bonds form whenever a hydrogen atom is bonded to one of the more electronegative atoms, such as a fluorine, oxygen, nitrogen, or chlorine atom," but it should read, "Hydrogen bonds form whenever a hydrogen atom is bonded to one of the more electronegative atoms, such as a fluorine, oxygen or nitrogen atom."	Remove "chlorine" from the answer to part (c) of question 7.	Typo
Chapter 10.3: Liquids and Solids; Section 10.3: Phase Transitions; Subsection: Melting and Freezing The phrase, "the reciprocal process of melting and	Revise "process" to "processes" in the second paragraph of subsection Melting and Freezing as follows: In a mixture of solid and liquid at equilibrium, the reciprocal processes of melting and freezing occur at equal rates, ...	Typo

freezing occur at equal rates," should read, "the reciprocal processes of melting and freezing occur at equal rates."		
Chapter 10.3: Liquids and Solids; Section 10.3: Phase Transitions; Subsection: Vaporization and Condensation; Example 10.5 In the Check Your Learning to Example 10.5, the question uses a vapor pressure of 20 degrees, but the table says 25 degrees.	Revise the table in the Check Your Learning of Example 10.5 Explaining Vapor Pressure in Terms of IMFs to read "Vapor Pressure at 20 degrees C" instead of "25 degrees C".	Typo
Chapter 10.5: Liquids and Solids; Section 10.5: The Solid State of Matter The learning objective, "Define and describe the bonding and properties of ionic and molecular, metallic and covalent network crystalline solids" should read, "Define and describe the bonding and properties of ionic, molecular, metallic and covalent network crystalline solids."	Add commas to the first learning objective for section The Solid State of Matter as follows: Define and describe the bonding and properties of ionic, molecular, metallic, and covalent network crystalline solids.	Typo
Chapter 10.6: Liquids and Solids, Section: Lattice Structures in Crystalline Solids, Figure 10.59 Figure 10.59 shows an ionic crystal and the text explains that a CsCl crystal can be described as a simple unit cell….but there is a label in the figure that says 'Body-centered simple cubic structure'. This is VERY confusing.	Revise the label for Figure 10.59 to "Simple cubic structure".	Minor
Chapter 10.6: Liquids and Solids; Section 10.6: Lattice Structures in Crystalline Solids; Subsection: Unit Cells of Ionic Compounds In	Revise Figure 10.60 to show Face-Centered Cubic structure, not Body-Centered Cubic structure.	Typo

Figures 10.59 and 10.60, are the diagrams for the structures of CsCl and NaCl correct? The labels appear to be wrong.		
Chapter 11: Solutions and Colloids, End of Chapter Exercises, 33 Change answer to Ch. 11 33. (b) mole fraction NH4NO3 = 0.0925, mole fraction H2O = 0.907	Revise the solution to part b of exercise 33 as follows: Solution (b) XNH4NO3 = 0.9928	Typo
Chapter 11.1: Solutions and Colloids, Section: The Dissolution Process Instead of “As for the mixture of sugar and water…” I think it would be better to say “As with the mixture of sugar and water…”	Revise the first sentence of the third paragraph as follows: "As with the mixture of sugar and water, this mixture is also an aqueous solution."	Minor
Chapter 11.1: Solutions and Colloids; Section 11.1: The Dissolution Process In the second chemical equation in section 11.1, the Cr_2O_7 should have a charge of 2-.	Revise the second chemical equation in section 11.1 The Dissolution Process to have a charge of 2- for Cr2O7, as follows: K2Cr2O7(s) --> 2K+(aq) plus Cr2O7 2-(aq)	Typo
Chapter 11.1: Solutions and Colloids; Section 11.1: The Dissolution Process The phrase, "When a small amount of solid potassium chromate is added to water, the compound dissolves and dissociates to yield potassium ions and dichromate ions," should read, "When a small amount of solid potassium dichromate is added to water, the compound dissolves and dissociates to yield potassium ions and dichromate ions..."	Revise "potassium chromate" to "potassium dichromate" in the third paragraph of Section 11.1 The Dissolution Process as follows: When a small amount of solid potassium dichromate is added to water, ...	Typo
Chapter 11.4: Solutions and Colloids, Section: Colligative Properties, Example 11.2 Example 11.2. The text takes	Revise part (a) of the solution for Example 11.2 Calculating Mole Fraction and Molality as follows: Solution (a) The mole fraction... mol H2O = 2000 g × (1 mol H2O/18.02 g H2O) = 111 mol H2O	Minor

2000g of H2O, divides by the molar mass of H2O (18.02g) and arrives at 11.1 moles, when it should be 111 moles. This error propagates to the calculation of the mole fraction of H2O in the solution. By the way... I love you guys for fighting the shameless textbook cartel. Thank you thank you thank you!	Xethylene glycol =[35.8 mol C2H4(OH)2]/[(35.8 + 111) mol total] = 0.245	
Chapter 11.4: Solutions and Colloids, Section: Colligative Properties, Subsection: Colligative Properties of Electrolytes Page 640, First sentence. Should say "…solution of NaCl contains 2.0 moles of ions…"	Revise the first sentence after Example 11.11 as follows: "Assuming complete dissociation, a 1.0 m aqueous solution of NaCl contains 2.0 mole of ions (1.0 mol Na+ and 1.0 mol Cl-) per each kilogram of water..."	Critical
Chapter 11.4: Solutions and Colloids, Section: Colligative Properties, Subsection: Phase Diagram for an Aqueous Solution of a Nonelectrolyte Page 633, line 5: ?Tb should be replaced with ?Tf.	In the last paragraph, revise "DeltaT_b" to "DeltaT_f".	Major
Chapter 11.5: Solutions and Colloids; Section 11.5: Colloids; Subsection: Preparation of Colloidal Systems In the chemical equation that follows table 11.4, the state of 3Cl^- should be (s).	Revise the first chemical equation in subsection Preparation of Colloidal Systems as follows: Fe3+(aq) + 3Cl-(aq) + 6H2 O(l) --> Fe(OH)3(s) + H3 O+(aq) + 3Cl-(aq) Previous: Fe3+(s) + 3Cl-(g) + 6H2 O(l) --> Fe(OH)3(aq) + H3 O+(aq) + 3Cl-(aq)	Typo
Chapter 12: Kinetics, Answer Key Chapter 12 Problem #55. The answer in the appendix (Page 1339 of the pdf file) has the terms -Ea/R and 1/T mixed up. The answer should read "... a plot of 1/T gives a straight line with the slope -Ea/R" The answer is correct in the	Revise the answer to 53 as follows: 53. After finding k at several different temperatures, a plot of 1/T gives a straight line with the slope -Ea/R, ...	Minor

separate Student Solutions Manual.		
Chapter 12: Kinetics, Answer Key My students have found six typos in the Chapter 12 end-of-chapter problems and in the solutions manual. Each typo is detailed on its own page in the attached document.	Revise the answers to questions 5, 43, and 81 as follows: 5. b. 0.0250 mol L^-1 s^-1 43. 1.0 x 10^7 L mol^-1 min^-1 81. a. b	Typo
Chapter 12: Kinetics, Answer Key Page 1337 Answer Key to problem 33 (from Chapter 12) The graph is labeled as [SO2Cl2] (M) (y axis) versus time (s) (x axis). The labels are in the correct place but the numbers on the y axis belong on the x axis and the numbers on the x axis belong on the y axis. I also suggest getting better data because this should be a straight line but it looks curved to me.	Revise the graph in the solution for exercise 33 to show a straight line. Switch the values on the x- and y-axes.	Critical
Chapter 12: Kinetics, End of Chapter Exercises, 23 The answer to Ch. 12, #23 has the wrong units of time for k. The answer should be k = 8.0 x 10-8 L/mol.h	In the solution to exercise 23, revise "L/mol/s" to "L/mol/h".	Typo
Chapter 12.1: Kinetics, Section: Chemical Reaction Rates, Figure 12.5 The equation in figure 12.5 is not balanced correctly. It should be 2NH3 ? N2 + 3H2	Revise the equation in the caption for Figure 12.5 to "2NH3 --> N2 + 3H2".	Critical
Chapter 12.3: Kinetics, Section: Rate Laws In the sentence “In Example 12.4, a second order reaction, we found the units for k to be L mole-4 s-1…” The units are wrong they should be L . mol-1 . s-1	In the paragraph above Table 12.1, revise the units for k to "L mol^-1 s^-1".	Major
Chapter 12.5: Kinetics,	Revise the last sentence of the caption for Figure	Typo

Section: Collision Theory The last sentence in the description of Figure 12.16: Should say “The curve’s peak represents the transition state”	12.16 as follows: "The curve’s peak represents the transition state."	
Chapter 12.6: Kinetics, Section: Reaction Mechanisms Figure 12.19 says that it shows the “probable mechanism” for the dissociation of two HI molecules into hydrogen and iodine molecules. The reverse of this reaction was extensively studied in the 1960’s by Sullivan (see Journal of Chemical Physics 47, 1967, pp 73-78), who showed conclusively that the “four-center” mechanism depicted in Figure 12.19 was wrong. This fact is specifically mentioned in some general chemistry texts, such as Chang’s “Chemistry,” as well as in some physical chemistry texts and more advanced texts, for example “Chemical Kinetics” by Pilling and Seakins or “Chemical Kinetics and Dynamics” by Steinfeld, Francisco, and Hase.	Revise the last paragraph of Section Reaction Mechanisms as follows: "Some chemical reactions have mechanisms that consist of a single bimolecular elementary reaction. One example is the reaction of nitrogen dioxide with carbon monoxide: NO2(g) + CO(g) --> NO(g) + CO2(g) Figure 12.19 Caption: The probable mechanism for the reaction between NO2 and CO to yield NO and CO2. Bimolecular elementary reactions may also be involved as steps in a multistep reaction mechanism...	Major
Chapter 13: Fundamental Equilibrium Concepts, End of Chapter Exercises, 25 Ch. 13, Problem 25(b) should have phases for the reactants and products. All phases should be gas (g).	Revise exercise 25 part b as follows: 25. Convert the values of Kc to values of KP or the values of KP to values of Kc. (b) H2 (g) + I2 (g) <--> 2HI (g)	Major
Chapter 13: Fundamental Equilibrium Concepts, End of Chapter Exercises, 79 Answer to Ch. 13 79) should be [PCl3] = [Cl2] = 0.195 M,	In the solution to exercise 79, revise "[PCl3]" to "[PCl5]".	Typo

[PCl5] = 1.81 M		
Chapter 13: Fundamental Equilibrium Concepts, End of Chapter Exercises, 87 Correct answer to Ch. 13 #87 is 33 g CaCO3	Revise the solution to exercise 87 to 33 g.	Typo
Chapter 13.2: Fundamental Equilibrium Concepts, Section: Equilibrium Calculations, Example 13.6 image table in section Calculation of an Equilibrium Constant has extraneous text. Should be just numbers, not [.....]i. One never puts numbers into an "initial concentration" bracket.	In Example 13.6 Calculation of an Equilibrium Constant, revise the first ICE table to show "1.000 x 10^-3 - x" for Equilibrium concentration (M).	Typo
Chapter 13.2: Fundamental Equilibrium Concepts, Section: Equilibrium Constants, Figure 13.7 Figure 13.7, right side "At equilibrium" image for mixture 3 is still incorrect, in both the 2015 and 2016 printings of the textbook. Using the values in the latest printing give an equilibrium constant that is the inverse of what it should actually be.	Revise mixture 3 in the right side of Figure 13.7 to show the correct equilibrium constant.	Major
Chapter 13.4: Fundamental Equilibrium Concepts, Section: Equilibrium Calculations, End of Chapter Exercises Chapter 13.4 Exercise #93 has a typo in the formula for Kc. It should read: (PH2)^2. I.e. the partial pressure of H2 should be squared, not cubed. The rest of the equation is fine.	Revise the exponent in the denominator of the equation in exercise 93 from "3" to "2".	Typo
Chapter 13.4: Fundamental Equilibrium Concepts, Section: Equilibrium Calculations, Subsection:	Below the Kc expression, revise “x2” to "x^2".	Minor

Calculation of Changes in Concentration Below the Kc expression. In the “x2” term, the "2" should be in superscript since this term is "x squared".		
Chapter 14: Acid-Base Equilibria, Appendix H Appendix H – some Ka values do not match values used within Chapter 14. Ka for HCO3- should be 4.7 x 10^-11 instead of 5.6 x 10^-11	Revise the Ka value given in Appendix H for HCO3- to 4.7 x 10 ^-11. Update examples in Ch. 14 to match.	Typo
Chapter 14: Acid-Base Equilibria, End of Chapter Exercises, 37 Ch. 14, Problem #37. The second conjugate acid should have the formula (CH3)2NH3+, NOT (CH3)2NH.	Revise exercise 37 as follows: 37. Which base, CH3NH2 or (CH3)2NH, is the strongest base? Which conjugate acid, (CH3)2NH2+ or (CH3)2NH3+, is the strongest acid?	Typo
Chapter 14: Acid-Base Equilibria; Answer Key; Question 81 The answer to question 81 in chapter 14 does not make sense.	Revise the answer to question 81 as follows: 81. [H3O+] and [HCO3?] are practically equal	Typo
Chapter 14: Acid-Base Equilibria; End of Chapter Exercises; Question 33 The chemical equation that is the solution to question 33 in chapter 14 is not balanced.	Add a "2" in front of HCl in the equation for question 33 as follows: 33. Mg(OH)2(s) + 2HCl(aq) --> Mg2+(aq) + 2Cl-(aq) + 2H2 O(l)	Typo
Chapter 14: Acid-Base Equilibria; End of Chapter Exercises; Question 37 In Chapter 14, question 37, "strongest acid" should be "stronger acid."	Revise "strongest" to "stronger" in question 37.	Typo
Chapter 14.1: Acid-Base Equilibria, Section: Brønsted-Lowry Acids and Bases In your passage about the development of acid-base theories Carl Axel Arrhenius is named as the person behind the Arrhenius model	In the first paragraph, revise "Carl Axel Arrhenius" to "Svante Arrhenius".	Major

in 1884. Actually it was Svante Arrhenius. As online research shows, Carl Axel Arrhenius was an army officer, who died in 1824. Your sincerely, Gerd Berger		
Chapter 14.1: Acid-Base Equilibria; Section 14.1: Bronsted-Lowry Acids and Bases The phrase, "adding ammonia to water yields hydroxide ions and ammonium ions" should be "adding a base to water yields hydroxide ions and a corresponding cation." Note that the example given does not match the text description.	Revise the text as follows: "Adding pyridine to water yields hydroxide ions and pyridinium ions." (Previous: Adding ammonia to water yields hydroxide ions and ammonium ions.)	Typo
Chapter 14.1: Acid-Base Equilibria; Section 14.1: Bronsted-Lowry Acids and Bases; Example 14.1 In Example 14.1, remove the + sign after the superscript 2. (There are two instances of this.)	Remove the + sign after the superscript 2 in the first equation in Example 14.1 Ion Concentrations in Pure Water as follows: Kw = [H3O+][OH-] = [H3O+]2 = [OH-]2 = 1.0 x 10-14	Typo
Chapter 14.1: Acid-Base Equilibria; Section 14.1: Bronsted-Lowry Acids and Bases; Summary The last equation in the summary of section 14.1 has a typo. H_2O should be H_3O.	Revise the last equation n the summary of section 14.1 from "H2O" to "H3O" as follows: Kw = [H3O+][OH?] = 1.0 × 10^-14 at 25 degrees C	Typo
Chapter 14.3: Acid-Base Equilibria, Section: Relative Strengths of Acids and Bases p802 - Reaction missing a species and ICE table has the columns placed incorrectly	Revise Example 14.11 Determination of Ka or Kb from pH as follows: Delete the first ICE table in the Solution. Revise Example 14.12 Equilibrium Concentrations in a Solution of a Weak Acid as follows: Correct the alignment of the columns in the first ICE table in the Solution.	Minor
Chapter 14.3: Acid-Base Equilibria, Section: Relative Strengths of Acids and Bases, Subsection: Effect of Molecular Structure on Acid-Base Strength Figure 14.13 –	In the first paragraph, revise "group 7A" to "group 17" and "group 6A" to "group 16".	Major

The group numbers in the figure do not match the group numbers in the preceding text. One method of numbering groups in the periodic table should be used throughout the entire textbook.		
Chapter 14.3: Acid-Base Equilibria; Section 14.3: Relative Strengths of Acids and Bases In the phrase, "by measuring their equlibrium constants," equilibrium is misspelled.	Correct the spelling of "equlibrium" to "equilibrium".	Typo
Chapter 14.3: Acid-Base Equilibria; Section 14.3: Relative Strengths of Acids and Bases; Subsection: The Ionization of Weak Acids and Weak Bases In the caption to Figure 14.9, the phrase, "is has a pH of 3," should be, "has a pH of 3."	Delete the word "is" in the caption for Figure 14.9 pH paper as follows: ...solution of CH3CO2H (beaker on right) has a pH of 3...	Typo
Chapter 14.4: Acid-Base Equilibria, Section: Hydrolysis of Salt Solutions, Section: Salts of Weak Acids and Strong Bases The second sentence of the second paragraph states “The sodium ion, as the conjugate acid of a strong base, has not effect on the acidity of the solution.” Na+ is not the conjugate acid of NaOH. Water is the conjugate acid of NaOH, and Na+ is simply a spectator ion that does not form an acidic hydrated species like other metal cations.	Revise the second paragraph as follows: "A solution of this salt contains sodium ions and acetate ions. The sodium ion has no effect on the acidity of the solution. However, the acetate ion, the conjugate base of acetic acid, reacts with water and increases the concentration of hydroxide ion:"	Critical
Chapter 14.4: Acid-Base Equilibria, Section: Hydrolysis of Salt Solutions, Subsection: Equilibrium in a	Revise the answer to part(c) of Example 14.17 "Determining the Acidic or Basic Nature of Salts" Check Your Learning to “acidic.”	Major

Solution of a Salt of a Weak Acid and a Weak Base Revise the answer to letter (c) of Check Your Learning in Example 14.17 to “acidic.”		
Chapter 14.4: Acid-Base Equilibria, Section: Hydrolysis of Salt Solutions, Subsection: Equilibrium in a Solution of a Salt of a Weak Acid and a Weak Base There is an error in the reasoning and calculation used to determine an answer to Example 14.17 (d) on p. 814. (d) The Na+ ion is a spectator, while the HPO42- ion is amphiprotic, with a Ka of 4.2 x 10^-13. The Kb of HPO42- can be determined from the Ka of its conjugate acid, H2PO4-: Kb = (1.0 x 10^-14) / (6.2 x 10^-8) = 1.6 x 10^-7. Since Kb > Ka, the aqueous solution will be basic.	Revise the solution to Example 14.17 "Determining the Acidic or Basic Nature of Salts" as follows: (d) The Na+ cation is a spectator, and will not affect the pH of the solution, while the HPO4^2- anion is amphiprotic. The Ka of HPO4^2- is 4.2 × 10^-13, and its Kb is (1.0 × 10^-14)/(6.2 × 10^-8) = 1.6 × 10^-7.	Major
Chapter 14.4: Acid-Base Equilibria, Section: Hydrolysis of Salt Solutions, Subsection: Equilibrium in a Solution of a Salt of a Weak Acid and a Weak Base There is an error in the reasoning and calculation used to determine the answer to Example 14.17 (b) on p. 814. (b) The Na+ cation is a spectator; and will not affect the pH of the solution; while the HCO3– anion is amphiprotic, it could either behave as an acid or a base. The Ka of HCO3– is 4.7 x 10^-11; the Kb of HCO3– can be determined from the Ka of its conjugate acid, H2CO3: Kb = (1.0 x 10^-14) / (4.3 x	Revise the solution to Example 14.17 "Determining the Acidic or Basic Nature of Salts" as follows: (b) The Na+ cation is a spectator, and will not affect the pH of the solution; while the HCO3- anion is amphiprotic. The Ka of HCO3- is 4.7 × 10^-11, and its Kb is (1.0 × 10^-14)/(4.3 × 10^-7) = 2.3 × 10^-8.	Major

10^-7) = 2.3 x 10^-8. Since Kb > Ka, the aqueous solution will be basic.		
Chapter 14.4: Acid-Base Equilibria; Section 14.4: Hydrolysis of Salt Solutions; Subsection: The Ionization of Hydrated Metal Ions The sentence, "Note that some of these aluminum species are exhibiting amphiprotic behavior, since they are acting as acids when they appear on the right side of the equilibrium expressions and as bases when they appear on the left side," should read, "Note that some of these aluminum species are exhibiting amphiprotic behavior, since they are acting as acids when they appear on the left side of the equilibrium expressions and as bases when they appear on the right side."	Switch "right" and "left" in the fourth paragraph of Subsection The Ionization of Hydrated Metal Ions as follows: Note that some of these aluminum species are exhibiting amphiprotic behavior, since they are acting as acids when they appear on the left side of the equilibrium expressions and as bases when they appear on the right side.	Typo
Chapter 14.5: Acid-Base Equilibria, Section: Polyprotic Acids p823 - ICE table columns not aligned. submitted via ZenDesk	In Example 14.19 Ionization of a Diprotic Acid, revise the alignment of the columns in the first ICE table.	Minor
Chapter 14.6: Acid-Base Equilibria, Section: Buffers, End of Chapter Exercises The answer for Chapter 14 problem 107 in the back of the book is incomplete. It does not give an answer for the [saccharin] ([HA]). Assuming the question is considering that the 'buffered' solution does not change pH, then the Henderson-Hasselbach equation gives an answer: [HA] = 6.1x10^-9	Revise the answer to exercise 107 as follows: 107. Saccharin, C7H4NSO3H, is a weak acid (Ka = 2.1 x 10^-2)... Answer: The molar mass of sodium saccharide is 205.169 g/mol. Using the abbreviations HA for saccharin and NaA for sodium saccharide the number of moles of NaA in the solution is: 9.75 x 10^-6 mol The pKa for [HA] is 1.68, so [HA] = 6.2 x 19^-9 M. Thus, [A-] (saccharin ions) is 3.90 x 10^-5 M.	Minor

Chapter 14.7: Acid-Base Equilibria, Section: Acid-Base Titrations, End of Chapter Exercises Problem #112 of Chapter 14 (pg.828) does not state a proper question. Should it read something like: "WHY can we ignore...?"	Revise exercise 112 as follows: "Why can we ignore the contribution of water to the concentration of OH- in a solution of the following bases..."	Minor
Chapter 14.7: Acid-Base Equilibria; Section 14.7: Acid-Base Titrations; Subsection: Titration Curve The caption for Figure 14.21 reads, "(a) The titration curve for the titration of 25.00 mL of 0.100 M CH_3COOH (weak acid) with 0.100 M NaOH (strong base) has an equivalence point of 7.00 pH. (b) The titration curve for the titration of 25.00 mL of 0.100 M HCl (strong acid) with 0.100 M NaOH (strong base) has an equivalence point of 8.72 pH." However, it should read, "(a) The titration curve for the titration of 25.00 mL of 0.100 M HCl (strong acid) with 0.100 M NaOH (strong base) has an equivalence point of 7.00 pH. (b) The titration curve for the titration of 25.00 mL of 0.100 M CH_3COOH (weak acid) with 0.100 M NaOH (strong base) has an equivalence point of 8.72 pH."	Reivse "CH3COOH (weak acid)" to "HCl (strong acid)" in part (a) of the caption for Figure 12.21 titration curves.	Typo
Chapter 15: Equilibria of Other Reaction Classes, Section: Precipitation and Dissolution In solving for the formation of a solid, two Ksp values are given and two Molar concentrations. In the	Revise the solution to Example 15.11 "Precipitation of Silver Halides" as follows: Solution ... For AgI: AgI precipitates when Q equals Ksp for AgI (1.5 × 10^-16). When [I-] = 0.0010 M: Q = [Ag+][I-] = [Ag+](0.0010) = 1.5 × 10^-16 [Ag+] = (1.5 × 10^-16)/(0.0010) = 1.5 × 10^-15 M	Major

first calculation to find the concentration of Silver, the wrong Ksp values and concentration are plugged in for AgI, but the correct answer is still given as if the right numbers had been plugged in.		
Chapter 15.1: Equilibria of Other Reaction Classes, Section: Precipitation and Dissolution, End of Chapter Exercises The answers for Chapter 15.1 29a and 29b are incorrect in the Solutions in the back of the book. The correct answers should be: 29a: 1.5x10^-4 : Ksp = [Tl+][Cl-] = (1.21x10^-2)(1.2x10-2) = 1.5x10^-4 29b: 8.2x10^-55 : Ksp = [Ce+4][IO3-]^4 = (1.8x10^-4)(2.6x10^-13)^4 = 8.2x10^-55 I suppose it is also possible that instead of incorrect answers, the listed concentrations are incorrect. In either case, the concentrations and the answers don't match. 29c-e are all correct, however.	Revise the answer to exercise 29 as follows: 29. The following concentrations are found in mixtures of ions in equilibrium with slightly soluble solids. From the concentrations given, calculate Ksp for each of the slightly soluble solids indicated: (a) TlCl: [Tl+] = 1.21 x 10^-2 M, [Cl-] = 1.2 x 10^-2 M (b) Ce(IO3)4: [Ce4+] = 1.8 x 10^-4 M, [IO3-] = 2.6 x 10^-13 M ... Answer: (a) 1.7 x 10^-4 (b) 8.2 x 10^-55	Minor
Chapter 15.1: Equilibria of Other Reaction Classes, Section: Precipitation and Dissolution, Example 15.10 Example Problem 15.10 (pg 841 PDF) has a typo in the Ksp value for Mn(OH)2. The value should be 2x10^-13 (per Appendix J).	Revise the Ksp value in the soultion of Example 15.10 Concentrations Following Precipitation as follows: "Ksp = 2 x 10^-13"	Minor
Chapter 15.1: Equilibria of Other Reaction Classes, Section: Precipitation and Dissolution, Example 15.12 The answer to the check your learning question in example 15.12 should be 4 x	Revise the answer to Check Your Learning in Example 15.12 Common Ion Effect as follows: Check Your Learning Calculate the molar solubility of aluminum hydroxide... Answer: 4 x 10^-11	Major

10^-11.		
Chapter 15.1: Equilibria of Other Reaction Classes, Section: Precipitation and Dissolution, Example 15.5 Revise answer for Check Your Learning exercsise 15.5 to be: 2.08 x 10^-4. Location: Chapter 15: Equilibria of Other Reaction Classes; Section 15.1: Precipitation and Dissolution; subsection: Ksp and Solubility Both the numerical answer and the number of significant figures are incorrect. For the equilibrium: TlCl (s) --> Tl^+ (aq) + Cl^- (aq) we have Ksp = [Tl^+][Cl^-] Given 3.46 g TlCl dissolves in 1 L, it follows that: 3.46g/(239.93 g/mol) = 0.01442 mol TlCl dissolves in 1 L, so there will be the following concentrations: [Tl^+] = [Cl^-] = 0.01442 M so: Ksp = (0.01442 M)(0.01442 M) = 2.08 x 10 ^-4	Revise the solution to the Check Your Learning question in Example 15.5 Determination of Ksp from Gram Solubility as follows: Answer 2.08 × 10^-4	Major
Chapter 15.2: Equilibria of Other Reaction Classes, Section: Lewis Acids and Bases, Table 15.2 Table 15.2. The title of the table should be “… Formation Constant” NOT “…Formulation Constants”	Revise the title of Table 15.2 to "Common Complex Ions by Decreasing Formation Constants".	Typo
Chapter 15.3: Equilibria of Other Reaction Classes, Section: Multiple Equilibria, End of Chapter Exercises Problem #103 of the Chapter 15.3 Problem set has an incorrect answer in the back of the book. Using the values from the appendix of: Ksp CdCO3 = 5.2x10^-12 H2CO3 Ka1 = 4.3x10^-7, Ka2 =	Revise exercise 103 as follows: 103. Calculate the concentration of Cd2+ resulting from the dissolution of CdCO3 in a solution that is 0.250 M in CH3CO2H, 0.375 M in NaCH3CO2, and 0.010 M in H2CO3.	Minor

5.6x10^-11 The value for the concentration of Cd2+ would be 2.3x10^-6 M. The book lists the answer as 3.1x10^-3 M		
Chapter 15.3: Equilibria of Other Reaction Classes, Section: Multiple Equilibria, End of Chapter Exercises Problem #107 of the Chapter 15.3 problem set has an incorrect answer in the back of the book. Using values from the Appendices of: Mg(OH)2 Ksp = 8.9x10^-12 HCN Ka = 4.9x10^-10 The answer should be 0.047g NaCN. The book lists the answer as 5.4x10^-3 g.	Revise the answer to exercise 107 to 0.0036 g.	Minor
Chapter 16: Thermodynamics, End of Chapter Exercises, 25 For Ch. 16, Problem #25. The questions should say "…values listed in Appendix G, calculate ?So298 for the following changes:"	In exercise 25, revise "S 298" to "Delta S 298".	Typo
Chapter 16: Thermodynamics, End of Chapter Exercises, 35 Chapter 16 #35 has an error with the phases of P4O10. In order for them to cancel out, the phases should match. For the free energy values listed, the phase P4P10 should be solid in both instances. That is, the final reaction should be written 6 H2O (g) + P4O10 (s) --> 4 H3PO4 (l) with delta G = -428.66 kJ/mol.	Revise the third equation in exercise 35 as follows: 35. Given: 6H2O(g) + P4O10(s)?4H3 PO4(l)	Typo
Chapter 16: Thermodynamics, End of Chapter Exercises, 57 I believe the correct answer	Revise the solution for exercise 57 part a to 22.1 kJ.	Typo

to Ch. 16 #57(a) should be 22.1 kJ NOT -22.1 kJ.		
Chapter 16: Thermodynamics, End of Chapter Exercises, 59 Ch. 16, Problem #59. Should be "77.1 kJ/mole". The "J" is missing in "kJ".	In exercise 59, revise "k/mole" to "kJ/mole".	Typo
Chapter 16.2: Thermodynamics, Section: Entropy Page 907: Third sentence below figure 16.8: "The probability of finding the system in this configuration is or 6/16 or 3/8….” Delete the second “or”.	In the first paragraph after Figure 16.8, delete the duplicate "or" before "6/16 or 3/8".	Typo
Chapter 16.4: Thermodynamics, Section: Free Energy, Example 16.11 Revise the answer to Check Your Learning Example 16.11 to be -41.7 kJ; yes. Location: Chapter 16: Thermodynamics; Section 16.4 Free Energy; Subsection: Free Energy and Equilibrium Using the equations: 2 NH3 --> 3 H2 + N2 and (delta)G = (delta)G(standard) + RTlnQ and the given values: (delta)G(standard) = 33.0 kJ /mol R = 8.3144 J/(mol K) = 8.3144 x 10^-3 kJ/(mol K) T = 875 degC + 273 = 1148 K [NH3] = [H2] = [N2] = (0.100 mol / 5.00 L) where: Q = ([H2]^3[N2])/[NH3]^2 we have: (delta)G = 33.0 kJ/mol + (8.3144 x 10^-3 kJ/(mol K))(1148 K)(ln{[(0.100/5.00)^3(0.100/5.00)]/(0.100/5.00)^2} carrying out the math: (delta)G = -41.7 kJ/mol or (delta)G = -41.7 kJ for the	Revise the answer for the Check Your Learning for Example 16.11 Calculating DeltaG under Nonstandard Conditions as follows: Answer Delta G = -47 kJ/mol; yes	Major

reaction as written I tried to determine how the current incorrect answer in the text was obtained, but I can't figure out what the authors did wrong to get their answer.		
Chapter 16.4: Thermodynamics, Section: Free Energy, Subsection: Free Energy and Equilibrium The text states "Conversely, if Q < K, the process will proceed in the reverse direction until equilibrium is achieved". It should say "Q>K".	Revise the last sentence of the second paragraph of subsection Free Energy and Equilibrium as follows: ..."Conversely, if Q > K, the process will proceed in the reverse direction until equilibrium is achieved."	Typo
Chapter 17: Electrochemistry, Answer Key, Question 7 Q7 and answers do not correspond	Remove parts (a) of the answer to question 7, and re-letter the remaining answers to (a), (b), and (c).	Typo
Chapter 17: Electrochemistry, End of Chapter Exercises, 24 Ch. 17 #24(b): The reaction is not balanced. Should be 3Cu2+(aq) + 2Al(s) ? 2Al3+(aq) + 3Cu(s)	Revise part b of exercise 24 as follows: (b) 3Cu2+(aq) + 2Al(s) --> 2Al3+(aq) + 3Cu(s)	Minor
Chapter 17: Electrochemistry, End of Chapter Exercises, 28 Ch. 17 problem#28. Br- and Br2 are in the same phase, so they should be separated by a comma, not a single vertical line.	In exercise 28, replace the line between Br2 (aq) and br-(aq) with a comma.	Major
Chapter 17: Electrochemistry, End of Chapter Exercises, 31 Ch. 17 #31(c) I believe should say "bromide is oxidized to bromine"	Revise part c of exercise 31 as follows: 31. Determine the standard cell potential and the cell potential under the stated conditions... (c) The cell made of a half-cell in which 1.0 M aqueous bromide is oxidized to 0.11 M bromine ion and a half-cell in which aluminum ion at 0.023 M is reduced to aluminum metal.	Major
Chapter 17: Electrochemistry; Answer Key; Question 13 In the	Revise "Ni+" to Ni2+" in the solution to question 13 part (a).	Typo

solution to question 13 in Chapter 17, the charge on Ni should be 2+.		
Chapter 17.3: Electrochemistry, Section: Standard Reduction Potentials, Table 17.2 Standard reduction potential values in Appendix L, disagree with some of the values in Table 17.2.	Revise the following values in Table 17.2: Cu2+(aq) + 2e- --> Cu(s) +0.34 AgCl(s) + e- --> Ag(s) + Cl-(aq) +0.22233 Pb2+(aq) + 2e- --> Pb(s) -0.1262 Sn2+(aq) + 2e- --> Sn(s) -0.1375	Typo
Chapter 17.4: Electrochemistry, Section: The Nernst Equation When defining the Faraday constant on this page “F = ….” The constant goes from 9.648 x 10^4 to 9.684 x 10^4. I believe the number should remain the same.	In the equation for Faraday’s constant, revise "9.684" to "9.648".	Minor
Chapter 17.4: Electrochemistry, Section: The Nernst Equation, Example 17.5 In Example 17.5. The sentence “The two equilibrium constants differ slightly due to rounding in the constants 0.0257 V and 0.0592 V.” I find to be confusing, since in this example the equilibrium constant was only calculated with the 0.0592 V constant. I think it would be best to remove this sentence or modify it.	In Example 17.5 Equilibrium Constants, Standard Cell Potentials, and Standard Free Energy Changes, delete the following sentence: "The two equilibrium constants differ slightly due to rounding in the constants 0.0257 V and 0.0592 V."	Minor
Chapter 17.5: Electrochemistry, Section: Batteries and Fuel Cells, Subsection: Secondary Batteries The chemical reaction equations for lithium ion batteries in chapter 17 are not balanced correctly (one Li on the left, and 2x-1 on the right). The x-	In the discussion of Lithium ion batteries, revise the subscript "x - 1" to "1 - x" in the reactions given.	Typo

1 subscript should be 1-x.		
Chapter 17.5: Electrochemistry; Section 17.5: Batteries and Fuel Cells; Subsection: Primary Batteries In Figure 17.10, the top of the dry cell should be positive.	Revise the charge given at the top of the dry cell in Figure 17.10 to be positive.	Typo
Chapter 17.6: Electrochemistry, Section: Corrosion, Figure 17.18 Reporting several errors in the last figure in the "Corrosion" section of chapter 17. Details provided below, and a sample image illustrating the recommended revisions is attached. 1. The figure has arrows suggesting current flow through a "lead wire" connecting the protected item to the sacrificial anode. Readers will / should assume those arrows indicate flow of electrons, in which case they're pointing in the wrong direction (should be from sacrificial anode to protected item). Best remedy would be swap the locations of the protected item and the anode, that way the conventional depiction of an electrochemical cell, with anode on left and cathode on right, electrons flowing left-to-right, is honored. 2. The arrows in the soil give the incorrect impression that electrons are flowing through the soil -- these arrows should be removed, and perhaps replaced with more accurate depictions of the ion flow occuring within	Replace Figure 17.18 with an updated version that shows the electrons flowing from the sacrificial anode to the object to be protected.	Major

the soil. 3. Would be helpful to include typical half-reactions at each of the two objects, e.g., reduction of oxygen at the protected item and oxidation of anode material at the anode. 4. It's not clear if the wire connecting the two objects is labeled to indicate its function ("lead" as pronounced "leed") or its composition (the element Pb). If the former, better to replace "lead" with "connecting", or just omit the label altogether. If the latter, should replace "lead" with "Pb", though I'd argue against this non-useful detail being included at all. 5. Finally, the label "no power source is needed" should be removed. This is a true statement for "passive" cathodic protection, but not for "active" cathodic protection. Unless details are added to the text narrative to clarify these two different approaches, it's best not to give the false impression that cathodic protection never requires an external power source.		
Chapter 17.6: Electrochemistry; Section 17.6: Corrosion. In the equation, "cathode: O_2(s) + 2H^+(aq) + 4e^- yields 2H_2O(l)," the 2H^+ should be 4H^+.	Revise "2H+ (aq)" to "4H+ (aq)" in the equation after "The electrons reduce oxygen in the air in acidic solutions."	Typo
Chapter 18: Representative Metals, Metalloids, and Nonmetals; End of Chapter Exercises; Question 3 In the answer to question 3 in	Change "SeSe" to "SrSe" in the answer to question 3.	Typo

chapter 18, change SeSe to SrSe.		
Chapter 18: Representative Metals, Metalloids, and Nonmetals; Key Terms In the key terms list of chapter 18, change, "metal atoms of the metallic elements of groups 1, 2, 12, 13, 14, 15 and 16, which form ionic compounds by losing electrons from their outer s or p orbitals," to, "metal (representative) metallic elements of groups 1, 2, 12, 13, 14, 15 and 16, which form ionic compounds by losing electrons from their outer s or p orbitals."	Revise the key term metal from "metal" to "metal (representative)".	Typo
Chapter 18.1: Representative Metals, Metalloids, and Nonmetals; Section 18.1: Periodicity; Subsection: Group 12 In the caption to Figure 18.7, the phrase, "Zinc is an active transition metal," should say, "Zinc is an active metal..."	Revise "Zinc is an active transition metal" to "Zinc is an active metal" in the caption to Figure 18.7.	Typo
Chapter 18.2: Representative Metals, Metalloids, and Nonmetals; Section 18.2: Occurrence and Preparation of the Representative Metals; Subsection: The Preparation of Zinc Under the subsection, "The Preparation of Zinc," Co_2 should be CO_2.	Revise "Co2" to "CO2" in subsection The Preparation of Zinc.	Typo
Chapter 18.4: Representative Metals, Metalloids, and Nonmetals, Section: Structure and General Properties of the Nonmetals oxidation states missing from some	Properly align oxidation numbers below equations.	Typo

equations		
Chapter 18.4: Representative Metals, Metalloids, and Nonmetals; Section 18.4: Structure and General Properties of the Nonmetals The phrase, "There are four general aspects of the oxidation-reduction chemistry," should read, "There are five general aspects of the oxidation-reduction chemistry..."	Revise "four" to "five" in the phrase "There are five general aspects of the oxidation-reduction chemistry..."	Typo
Chapter 18.4: Representative Metals, Metalloids, and Nonmetals; Section 18.4: Structure and General Properties of the Nonmetals; Subsection: Phosphorus The phrase, "shown in Figure 18.24 and Figure 18.24," should read, "shown in Figure 18.24."	Revise the phrase "shown in Figure 18.24 and Figure 18.24," to "shown in Figure 18.24."	Typo
Chapter 18.4: Representative Metals, Metalloids, and Nonmetals; Section 18.4: Structure and General Properties of the Nonmetals; Subsection: Sulfur The phrase, "For example, members of group 15 have five valence elements," should read, "For example, members of group 15 have five valence electrons..."	Revise the phrase "members of group 15 have five valence elements," to "members of group 15 have five valence electrons" in subsection Sulfur.	Typo
Chapter 18.4: Representative Metals, Metalloids, and Nonmetals; Section 18.4: Structure and General Properties of the Nonmetals; Subsection: Sulfur The phrase, "so named because of the shape or its crystals," should read, "so named because of the	Revise "or its crystals" to "of its crystals" in subsection Sulfur.	Typo

shape of its crystals..."		
Chapter 19: Transition Metals and Coordination Chemistry; Answer Key; Question 19 In the answer to question 19 part (c) in chapter 19, HrCO should be HCrO.	Revise "HrCO" to "HCrO" in the answer to question 19 part (c).	Typo
Chapter 19.1: Transition Metals and Coordination Chemistry; Section 19.1: Occurrence, Preparation, and Properties of Transition Metals and Their Compounds The answer to question 17 part (b) in chapter 19 is missing a reaction arrow.	Add the missing reaction arrow to question 17 part (b).	Typo
Chapter 19.1: Transition Metals and Coordination Chemistry; Section 19.1: Occurrence, Preparation, and Properties of Transition Metals and Their Compounds; Question 21 The answer to question 21 part (c) in chapter 19 does not correspond with the question.	Revise the answer to question 21 part (c) as follows: (c) MnO4- + 5Fe2+ + 8H+ --> Mn2+ + 5Fe3+ + 4H2O	Typo
Chapter 19.2: Transition Metals and Coordination Chemistry, Section: Coordination Chemistry of Transition Metals Hi, I came across this in chapter 19 section 2 of the OpenStax Chemistry title: http://cnx.org/contents/havxkyvS@9.311:V5zcdoUo@6/Coordination-Chemistry-of-Tran Students are told "The four common exceptions are aqua (H2O), amine (NH3)," but at least since 1971 under the IUPAC Red Book recommendations NH3 has	Update the spelling of NH3 "amine" to "ammine" throughout.	Typo

been referred to as "ammine" so as to not confuse it with the functional group "amine" used in organic chemistry. I suspect this to be a typographical error. Please correct this so that students keep these concepts correctly in mind as they transfer between classes or schools.		
Chapter 20: Organic Chemistry; End of Chapter Exercises; Question 25 In the answer to question 25 part (a) in chapter 20, the double bond should be a triple bond.	Revise the double bond to a triple bond in the answer to question 25 part (a).	Typo
Chapter 20: Organic Chemistry; key terms Add "addition reaction" to the list of key terms for chapter 20. I suggest the definition, "reaction in which a double carbon-carbon bond forms a single carbon-carbon bond by the addition of a reactant. Typical reaction for an alkene."	Add the key term addition reaction to Chapter 20.	Typo
Chapter 20.1: Organic Chemistry; Section 20.1: Hydrocarbons; Subsection: The Basics of Organic Nomenclature: Naming Alkanes; Example 20.5 The answer to the Check Your Learning for Example 20.5 reads, "reactant: trans-3-hexene, product: 3,4-dichlorohexane" should be, "reactant: 3-hexene (could be cis or trans) product: 3,4-dichlorohexane."	Revise the answer to the Check Your Learning in Example 20.5 Alkene Reactivity and Naming to "reactant: cis-3-hexene product: 3,4-dichlorohexane".	Typo
Chapter 20.3: Organic Chemistry; Section 20.3:	Delete the misplaced structural formula in subsection Aldehydes and Ketones.	Typo

Aldehydes, Ketones, Carboxylic Acids, and Esters; Subsection: Aldehydes and Ketones The third image under the subsection, "Aldehydes and Ketones," has an extraneous image at the top.		
Chapter 20.3: Organic Chemistry; Section 20.3: Aldehydes, Ketones, Carboxylic Acids, and Esters; Subsection: Aldehydes and Ketones; Example 20.10 In the Check Your Learning to Example 20.10, the phrase, "reduced relative to the marked carbon atom in ethanol," should be, "reduced relative to the carbon atom in CH_2 in ethanol."	Revise the first figure in the Check Your Learning in Example 20.10 Oxidation and Reduction in Organic Chemistry so that the "C" is marked red.	Typo
Chapter 20.3: Organic Chemistry; Section 20.3: Aldehydes, Ketones, Carboxylic Acids, and Esters; Subsection: Aldehydes and Ketones; Question 47 The answer to question 47 part (b) in chapter 20 does not make sense.	Revise the answer to question 47 part (b) as follows: (b) CH3COCH3	Typo
Chapter 20.4: Organic Chemistry; Section 20.1: Hydrocarbons; Subsection: The Basics of Organic Nomenclature: Naming Alkanes; Example 20.4 The phrase, "(as shown by the red numbers) so the branch is connected to carbon 3," should read, "(as shown by the blue numbers) so the branch is connected to carbon 3..."	Reverse the use of "red" and "blue" in the solution to Example Example 20.4 Naming Substituted Alkanes.	Typo
Chapter 21.2: Nuclear Chemistry, Section: Nuclear	In Figure 21.4, add a negative sign before the first beta particle symbol.	Typo

Equations, Figure 21.4 In section 21.2 (nuclear equations) Figure 1, the first beta particle symbol is incorrect.		
Chapter 21.4: Nuclear Chemistry, Section: Transmutation and Nuclear Energy, Table 21.3 In Table 21.3. Californium row has an error. The reaction shown is for the preparation of Bk not Cf.	In Table 21.3 Preparation of Some of the Transuranium Elements, revise the row for californium as follows: californium -- Cf -- 98 -- 242/96 Cm + 4/2 He --> 245/98 Cf + 1/0 n	Major
Chapter 21.6: Nuclear Chemistry, Section: Biological Effects of Radiation, Subsection: Ionizing and Nonionizing Radiation The discussion of how radiation can damage biomolecules (chapter 21.6) shows ionized water (H2O cation) reacting with H2O to form hydronium cation plus hydroxyl ANION. This is obviously wrong. The text is correct in describing hydroxyl RADICAL as the bad actor, but the equation on p1219 and figure 21.32 have the typo. I.e. OH- should be OH• It's a typo, but it's totally egregious (chemically) and really needs to be fixed.	Revise OH- to OH(dot) in figure 21.32 and the figure above it.	Typo
Appendix B: Essential Mathematics; Section: Exponential Arithmetic In Appendix B, the sentence, "For example, 1,230,000,000 = 1.23 × 10^9 and 0.00000000036 × 10^?10." should read, "For example, 1,230,000,000 = 1.23 × 10^9 and 0.00000000036 = 3.6 × 10^?10."	In Appendix B, revise the sentence, "For example, 1,230,000,000 = 1.23 × 10^9 and 0.00000000036 × 10^?10." to "For example, 1,230,000,000 = 1.23 × 10^9 and 0.00000000036 = 3.6 × 10^?10."	Typo

Appendix B: Essential Mathematics; Section: Exponential Arithmetic; Subsection: Addition of Exponentials; Example B1 The solution to Example B1 should be, "3.00 × 10^?3 = 300 × 10^?5."	Revise the solution to Example B1 Adding Exponentials from 3.00 x 100^-3 to 3.00 x 10^-3.	Typo
Appendix H: Ionization Constants Of Weak Acids The Lewis structure for formic acid in Appendix H is missing a double bond between the C and the terminal O.	Revise the Lewis structure for formic acid to have a double bond between Carbon and Oxygen.	Minor