



Chemistry 2e.

Chemistry 2e Release Notes 2022

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Page Count Difference:

Changes in formatting and design have allowed the page count to be reduced from 1321 in the previous revision to 1207 in the new revision.

Errata:

Below is a table containing submitted errata and the resolutions that OpenStax has provided for this latest text. Beyond errata and related updates, this release includes significant additions of more diverse scientists and increased discussions of discoveries and scientific processes. New narratives include historical and recent contributors such as Alma Levant Hayden, Percy Lavon Julian, Lise Meitner, Alice Ball, Susan Kwolek, Reatha Clark King, and many others. These expansions are aimed at engaging students in the personal and practical impacts and opportunities related to chemical principles.

| Location | Detail | Resolution notes | Error type |
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| Preface | Image in Chem 2e and Atoms First 2e prefaces appears only there and nowhere else in the book, so there is no alt text available to assign to it. CNX_Chem_06_03_3dOrbitals.jpg | Alt text will be added to this figure. | Other |
| Chapter 1 Essential Ideas | JJ Thomson is incorrectly spelt "Thompson" in the book. | Our reviewers accepted this change, and it will be included in the next print cycle. | Typo |
| Chapter 1 Essential Ideas: Section 1.1 Chemistry in Context | Exercise 51(f) In the lesson you say "if the dropped digit is 5, round up or down, whichever yields an even value for the retained digit". But in the answer to exercise 51 f, you round 0.445 with two sig. dig. to 0.45 instead of 0.44 | Revise the answer to "0.44". | Incorrect answer, calculation, or solution |
| Chapter 1 Essential Ideas: Section 1.1 Chemistry in Context | in the caption for Figure 1.5. The text reports at present: "Note that clouds actually comprise either very small liquid water droplets or solid water crystals" (emphasis aded). The opposite is true: "Note that either very small liquid water droplets or solid water crystals actually comprise clouds." | Our reviewers accepted this change. | Other factual inaccuracy in content |
| Chapter 1 Essential Ideas: Section 1.2 Phases and Classification of Matter | The author wrote that "Pure substances that can be broken down by chemical changes are called compounds.", however, this definition seems inaccurate. For example, we won't view H ₂ and O ₂ as compounds, that's because they aren't consist of two or more than two kinds of elements. Nevertheless, if we apply the author's definition in this case, we can find out that H ₂ + O ₂ = H ₂ O, and in this reaction, both of the reactants are actually broken down by chemical changes | Revise "Pure substances that can be broken down by chemical changes are called compounds. This breakdown may produce either elements or other compounds, or both." to "Pure substances that are comprised of two or | Other factual inaccuracy in content |

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| | while both of which aren't categorized as compounds. Therefore, I suggest that we should change the definition into "a pure substance consist of two or more than two kinds of elements." | more elements are called compounds. Compounds may be broken down by chemical changes to yield either elements or other compounds, or both." | |
| Chapter 1 Essential Ideas: Section 1.3 Physical and Chemical Properties | I cant open "PhET density simulation" question 41,42,43 | The simulation and related questions will be updated. | Broken link |
| Chapter 1 Essential Ideas: Section 1.3 Physical and Chemical Properties | In Section 1.3 Physical and Chemical Changes Figure 1, the picture (a burning candle) is really misleading for my students. The description for the picture states, "Wax undergoes a physical change when solid wax is heated and forms liquid wax." This is a factual sentence; however, using a burning candle is an extremely poor example because during burning not only does the wax make the physical change to melted wax but simultaneously the burning candle is also undergoing a combustion reaction (a chemical reaction) as the wax changes into carbon dioxide and water. The picture should not be something that is undergoing both a physical and a chemical change. You could use a picture of wax being melted in a pot and it would not be misleading as the candle picture is. The whole point of section 1.3 is to teach the students the difference between physical and chemical changes. Figure 1 as a burning candle does not do this. Please help us instructors by changing the picture to anything else that is being melted but not combusted. Thank you | This figure will be updated. | Other |
| Chapter 1 Essential Ideas: Section 1.4 Measurements | Exercise 41 has 5 questions. Answer (d) is the answer of question (e), and there's no answer to question (d). Answer to (d) should be: red < green < blue < yellow. | Add "red < green < blue < yellow;" as the answer to part (d), and add "(e)" before "If the volumes are..." | Incorrect answer, calculation, or solution |
| Chapter 1 Essential Ideas: Section 1.4 Measurements | The MTOW of the Boeing 777-200ER on page 30 should be listed in newtons rather than kilograms. On page 32, the meter should be listed as 39.37 inches rather than 39.36 inches. The kilogram was redefined in March 2019 as a universal constant like the rest of the SI base units instead of the International Prototype Kilogram as listed on page 32. | This issue was addressed in another report and will be corrected in webview. | Other factual inaccuracy in content |
| Chapter 1 Essential Ideas: Section 1.4 Measurements | On May 20, 2019 the BIPM definitions for the SI base units took effect. It is suggested that the following text be modified in some simple way that reflects that reality. Suggestion: Replace "The standard unit of mass in the SI system is the kilogram (kg). A kilogram was originally defined as the mass of a liter of water (a cube of water with an edge length of exactly 0.1 meter). It is now defined by a certain cylinder of platinum-iridium alloy, which is kept in France (Figure 1.24). Any object with the same mass as this cylinder is said to have a mass of 1 kilogram. One kilogram is about 2.2 pounds. The gram (g) is exactly equal to 1/1000 of the mass of the kilogram (10 ⁻³ kg)." with "The standard unit of mass in the SI system is the kilogram (kg). A kilogram was originally defined as the mass of a liter of water (a cube of water at the temperature of its greatest density with an edge length of exactly 0.1 meter). In 1875 the definiton of a kilogram was redefined as the mass of a | This issue was addressed in another report and is correct in webview. | Other |

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| | <p>certain cylinder of platinum-iridium alloy kept in France (Figure 1.24). Any object with the same mass as that cylinder was said to have a mass of 1 kilogram. The gram (g) is 0.001 kilogram (10⁻³ kg). The definition of the international avoirdupois pound used in the commerce of some countries is defined in terms of the kilogram as precisely 0.45359237 kg. On May 20, 2019 the latest redefinition of the kilogram took effect. To make the unit of mass immune to the wear to which a physical specimen is subject, the kilogram is now based on the fixed values of constants of nature whose values had been chosen to agree with the best previous measurements of those constants before 2018.</p> | | |
| Chapter 1 Essential Ideas: Section 1.4 Measurements | <p>End of chapter Qs c) asking for base SI units so speed of sound should be m/s not km/s</p> | <p>Revise from kilometers/second to meters/second.</p> | <p>Other factual inaccuracy in content</p> |
| Chapter 1 Essential Ideas: Section 1.4 Measurements | <p>Many students in General Chemistry do not have strong math skills and the steps used in the calculation of density in the first problem in this section (also called Example 1.1 in the paper textbook) has been causing a problem for my students.</p> <p>The derivation is not wrong but it is confusing. The derivation currently on-line and in the paper copy is density = mass/volume=90.7g/8.00 cubic centimeters = 11.3 g/1.00 cubic centimeter = 11.3 g/cubic centimeter . For those of us who are Ph.D. chemists (and probably for those who are strong in science and math) we see no problem with this derivation. However, the purpose of OpenStax Chemistry is to provide clear guidance to beginning chemistry students. I would strongly suggest that in the derivation that the step showing 11.3g/1.00 cubic centimeter be eliminated. It is only confusing my students. They are using their scientific calculators and dividing 90.7 by 8.00 and getting 11.3375 which they know they must round with the correct number of significant figures. That extra step in the current derivation of showing 11.3 g/1.00 cubic centimeter is not helping; please omit this (unless you would like me to have them send all their e-mails about this confusing derivation to you).</p> | <p>Delete this step in the derivation.</p> | <p>General/pedagogical suggestion or question</p> |
| Chapter 1 Essential Ideas: Section 1.5 Measurement Uncertainty, Accuracy, and Precision | <p>Example 1.5, Solution of (b). The solution is presented as 0.86728... g/mL when the actual correct answer should be 0,866728... g/mL.</p> | <p>Revise "0.86728" to "0.866728".</p> | <p>Typo</p> |
| Chapter 1 Essential Ideas: Section 1.5 Measurement Uncertainty, Accuracy, and Precision | <p>The rule about rounding "5" to an even digit (list item 3 under "Significant Figures in Calculations) is not explained correctly. This rule only applies when 5 is the digit being dropped *and is the last nonzero digit*. The later qualifier is important because if the unrounded number has nonzero digits following that 5, then it is closer to the rounded up value than the rounded down value. This error is reinforced by the third bullet point example, which gives an incorrect explanation:</p> <p>"6.8752 rounds "up" to 6.88 (the dropped digit is 5, and the retained digit is even)". The correct reason to round up is because 6.8752 is closer to 6.88 (abs. difference = 0.0048) than to 6.87 (abs. difference = 0.0052).</p> | <p>Revise rule 3 as follows: "If the digit to be dropped (the one immediately to the right of the digit to be retained) is less than 5, "round down" and leave the retained digit unchanged; if it is more than 5, "round up" and increase the retained digit by 1. If the dropped digit is 5, and it's either the last digit in the number or it's followed only by zeros, round up or down, whichever yields</p> | <p>Other factual inaccuracy in content</p> |

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| | 6.7852 should still be rounded up to 6.79 and not to the even digit 6.78 for this same reason. The "bias" argument for rounding to the even applies to a single non-zero digit being dropped because there are only four digits that would go down (1-4) and five that would go up (5-9) using "normal" or "high school math" rounding rules. If the dropped digit is assumed to be uniformly distributed, this is a pretty significant bias towards increasing the value. The round to the even rule fixes this by having 5 go up as often as down (also assumes odd is as likely as even for the last retained digit). With two digits that get rounded away, the bias is only 50 up to 49 down, and is similarly removed if the only two digit case that is rounded to the even is 50. Rounding 51 through 59 to the nearest even while still always rounding 41-49 actually creates a downward bias (there are now 49 always round down pairs of digits to 40 always round up pairs). Same argument applies no matter how many digits are being dropped. | an even value for the retained digit. If any nonzero digits follow the dropped 5, round up. (The last part of this rule may strike you as a bit odd, but it's based on reliable statistics and is aimed at avoiding any bias when dropping the digit "5," since it is equally close to both possible values of the retained digit.)" Revise the third bullet below this to the following: "6.8752 rounds "up" to 6.88 (the dropped digit is 5, and a nonzero digit follows it)" | |
| Chapter 1 Essential Ideas: Section 1.5 Measurement Uncertainty, Accuracy, and Precision | The solution for Ch. 1 # 51 (f) should be 0.45, not 0.44. | Revise the answer as needed. | Incorrect answer, calculation, or solution |
| Chapter 1 Essential Ideas: Section 1.6 Mathematical Treatment of Measurement Results | It says $(m/m/s)=s$. Based on order of operations, this would be $m/m=1$, then $1/s = s^{-1}$. It needs to use $(m/(m/s))=s$ because then if you are dividing by a fraction, you are multiplying by the reciprocal, so $m \cdot (s/m)=s$ | Revise " $(m/m/s = s)$ " to " $(m/(m/s) = s)$ ". | Incorrect answer, calculation, or solution |
| Chapter 1 Essential Ideas: Section 1.6 Mathematical Treatment of Measurement Results | In example 1.9, before it says the first two steps for volume conversion (how to get from quarts to millileter), it says "Volume may be converted from quarts to millimeters via two steps," when it should say millileters. | Revise "millimeters" to "milliliters". | Typo |
| Chapter 1 Essential Ideas: Section 1.6 Mathematical Treatment of Measurement Results | In the equation relating the temperature (T) scales converting from Celsius to Fahrenheit the book states incorrectly +32C and it should be corrected to 32F. Otherwise, you are teaching to add apples and oranges to produce apples. | Revise C to F. | Other factual inaccuracy in content |
| Chapter 1 PowerPoint, Slide 32 | Instructor PowerPoint material, Chapter 1, Slide 32 - it should read as 'most elements exist as individual atoms 'only a few exist as molecules' | This slide will be deleted from the PowerPoint. | Other factual inaccuracy in content |
| Chapter 1, Chapter 3, Appendix D, Index | Update to revise the definitions of several fundamental physical constants that were adopted May 2019. | Revise as indicated. | General/pedagogical suggestion or question |
| Chapter 2 Atoms, Molecules, and Ions: Section 2.1 Early Ideas in Atomic Theory | Example 2.2 The solution explanation states "...with A having one-half as much carbon per amount of oxygen (or twice as much carbon per amount of oxygen) as B." Carbon and oxygen should be switched in the first part. It should read: with A having one-half as much oxygen per amount of carbon... | Revise "carbon" to "oxygen" and vice versa. | Typo |

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| Chapter 2 Atoms, Molecules, and Ions: Section 2.1 Early Ideas in Atomic Theory | In Example 2.2 in the answer, the book reads " In compound Y, the mass ratio of carbon to oxygen is" when it should be " In compound Y, the mass ratio of carbon to hydrogen is" | Revise oxygen to hydrogen. | Typo |
| Chapter 2 Atoms, Molecules, and Ions: Section 2.1 Early Ideas in Atomic Theory | In the molecules represented at the right of the figure, the angle between the aldehyde function and the phenyl ring in the benzaldehyde differs from the ideal 120 degrees. | This figure will be updated. | Other factual inaccuracy in content |
| Chapter 2 Atoms, Molecules, and Ions: Section 2.2 Evolution of Atomic Theory | The time period should be listed as the late 19th Century rather than the late 1800s because late 1800s implies 1807-1809, which is not the time when the cathode ray tube experiments were performed. | Revise the sentence "The mercury or alcohol in a common..." to "The liquid in a common glass thermometer changes its volume as the temperature changes, and the position of the trapped liquid's surface along a printed scale may be used as a measure of temperature." | Other factual inaccuracy in content |
| Chapter 2 Atoms, Molecules, and Ions: Section 2.3 Atomic Structure and Symbolism | Oxyen-18 should be Oxygen-18 (it is missing the letter "g"). | Our reviewers accepted this change, and it will be included in the next print cycle. | Typo |
| Chapter 2 Atoms, Molecules, and Ions: Section 2.3 Atomic Structure and Symbolism | Chapter 2 Problem 25 Answer in the back of the book. The problems asks for greatest mass; however the answer provided is in moles. | Revise the solution to exercise 25 as follows: AlPO ₄ : 1.000 mol or 26.98 g Al Al ₂ Cl ₆ : 1.994 mol or 53.74 g Al Al ₂ S ₃ : 3.00 mol or 80.94 g Al The Al ₂ S ₃ sample thus contains the greatest mass of Al. | Typo |
| Chapter 2 Atoms, Molecules, and Ions: Section 2.3 Atomic Structure and Symbolism | The atomic mass listed in Ch 2 problem 25 for B-11 is incorrect. It should be 11.00931 amu, not 11.0931 amu. The student solution manual is also incorrect. I did not check the instructor's manual. | This will be updated in the Answer Key and solution manual. | Other factual inaccuracy in content |
| Chapter 2 Atoms, Molecules, and Ions: Section 2.4 Chemical Formulas | link is broken, it should be https://www.nsf.gov/news/mmg/mmg_disp.jsp?med_id=69373 | Our reviewers accepted this change. | Broken link |
| Chapter 2 Atoms, Molecules, and Ions: Section 2.4 Chemical Formulas | In the Exercises section of Chapter 2, you define the molecular formula of fructose as C ₁₂ H ₂₂ O ₁₁ . However, this is incorrect: C ₁₂ H ₂₂ O ₁₁ is actually the formula for table sugar, while the formula for fructose is C ₆ H ₁₂ O ₆ . | Revise "fructose" to "sucrose". | Other factual inaccuracy in content |
| Chapter 2 Atoms, Molecules, and Ions: Section 2.5 The Periodic Table | #42 a) Answer = Cl | The solution will be updated. | Incorrect answer, calculation, or solution |
| Chapter 2 Atoms, Molecules, and Ions: Section 2.6 | The title of this section is "Molecular and Ionic Compounds", but the text describes ionic compounds first and then | Revise the title to "Ionic and Molecular Compounds". | General/pedagogical |

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| Molecular and Ionic Compounds | molecular. Consider changing the order in the title to better reflect the contents. | | suggestion or question |
| Chapter 2 Atoms, Molecules, and Ions: Section 2.6 Molecular and Ionic Compounds | In Problem 48, revise $MgC_2H_3O_2$ to $Mg(C_2H_3O_2)_2$ | In exercise 48 part b, revise " $MgC_2H_3O_2$ " to " $Mg(C_2H_3O_2)_2$ ". | Other factual inaccuracy in content |
| Chapter 2 Atoms, Molecules, and Ions: Section 2.6 Molecular and Ionic Compounds | The acid for sulfate is misspelled. It should be sulfuric acid, not sulfiric acid. | Revise to "sulfuric". | Typo |
| Chapter 2 Atoms, Molecules, and Ions: Section 2.6 Molecular and Ionic Compounds | In the table of Common Polyatomic Ions the formula for chromic acid is incorrect in both the on-line and paper copies of OpenStax Chemistry. Currently, OpenStax has the formula as $H_2Cr_2O_4$ (forgive the lack of ability to insert the subscripts correctly but I did not see any word processor on-line assistant; this is incorrect. The correct formula for chromic acid is H_2CrO_4). | This formula will be corrected. | Incorrect answer, calculation, or solution |
| Chapter 2 Atoms, Molecules, and Ions: Section 2.7 Chemical Nomenclature | "Erin Brokovich" Should be "Brockovich" | Our reviewers accepted this change. | Typo |
| Chapter 2 Atoms, Molecules, and Ions: Section 2.7 Chemical Nomenclature | example 2.13 "Naming Ionic Compounds" -- question (d) lists $MgSO_4 \cdot 7H_2O$, but the solution discusses Cl and Cr, neither of which are in (d) | Delete "Cl-" and revise " Cr^{3+} " to " Mg^{2+} ". | Incorrect answer, calculation, or solution |
| Chapter 3 Composition of Substances and Solutions: Section 3.1 Formula Mass and the Mole Concept | #18 c) last item listed should be 6.9×10^2 moles of OXYGEN | The solution will be updated. | Incorrect answer, calculation, or solution |
| Chapter 3 Composition of Substances and Solutions: Section 3.1 Formula Mass and the Mole Concept | Human cells do not contain cell walls. Instead, "cell membrane" should be printed instead of "cell wall". | Revise "cell wall" to "cell membrane". | Other factual inaccuracy in content |
| Chapter 3 Composition of Substances and Solutions: Section 3.1 Formula Mass and the Mole Concept | The quoted number of $6.02214179 \times 10^{23}$ is an outdated figure. More recent experiments in 2018 have found the mole to be $6.02214076 \times 10^{23}$. Due to equipment becoming sufficiently precise over the past few years, it is now an exact number as part of the redefinition in 2019. | This issue was addressed in another report and will be corrected in webview. | Other factual inaccuracy in content |
| Chapter 3 Composition of Substances and Solutions: Section 3.1 Formula Mass | Starting with Example 3.3 cancel units but also should cancel unit (say g) and substance (say CO) some have unit (g) where it is better to show unit and substance (g CO) Again small. | This will be updated throughout the chapter. | General/pedagogical suggestion or question |

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| and the Mole Concept | | | |
| Chapter 3 Composition of Substances and Solutions: Section 3.1 Formula Mass and the Mole Concept | in Chapter 3.1, you print the phrase "or the Avogadro constant in honor of Italian scientist Amedeo Avogadro" twice, with the second time being right after the original sentence, but with only part of the original sentence coming after it. | Our reviewers accepted this change. | Typo |
| Chapter 3 Composition of Substances and Solutions: Section 3.1 Formula Mass and the Mole Concept | Exercise 25 says: "25. Determine which of the following contains the greatest mass of aluminum: 122 g of AlPO_4 , 266 g of Al_2C_{16} , or 225 g of Al_2S_3 ". Even if it looks fine here, " Al_2C_{16} " isn't written correctly. "1" is not written as a subscript, but on the same row with Al and C. | Revise "1" to the letter "l". | Typo |
| Chapter 3 Composition of Substances and Solutions: Section 3.1 Formula Mass and the Mole Concept | Ch 3 Problem #31 asks for the lowest number of molecules in an assortment of compounds. It wants students to calculate the number of molecules in each compound. By these calculations, the answer is correct, however technically, the answer is the CaH_2 (Calcium hydride) compound, regardless of quantity. Because CaH_2 is ionic, it contains zero molecules. Suggest that either that compound is removed or problem is changed to ask for formula units. | Revise " CaH_2 (42.09 g/mol)" to " C_3H_6 (42.08 g/mol)." | Incorrect answer, calculation, or solution |
| Chapter 3 Composition of Substances and Solutions: Section 3.1 Formula Mass and the Mole Concept | In exercise 13(a), the molar mass of S_8 is given as 256.528 g/mol. This is correct when the molar mass of S is taken to the 3rd decimal place. However, the periodic table provided in Appendix A provides the atomic/molar mass of S to only 2 decimal places. This inconsistency in presentation may cause confusion among students. | Revise "256.528 g/mol" to "256.48 g/mol". | Other |
| Chapter 3 Composition of Substances and Solutions: Section 3.2 Determining Empirical and Molecular Formulas | page 155/1331 Example 3.9 sigfig error: 71.8% Cl should be 71.78% Cl | Revise "71.8%" to "71.79%". | Incorrect answer, calculation, or solution |
| Chapter 3 Composition of Substances and Solutions: Section 3.2 Determining Empirical and Molecular Formulas | An instance of Cl has the number 1 instead of the lowercase letter l. Right after "Consider as another example a sample of compound determined to contain 5.31 g Cl and 8.40 g O. Following the same approach yields a tentative empirical formula of:" is the formula. In line 7 of the table code you will see C1 but it should be Cl. | Revise "C1" to "Cl" (letter l). | Typo |
| Chapter 3 Composition of Substances and Solutions: Section 3.2 Determining Empirical and Molecular Formulas | I would like to report. In Chapter 3.2, in the "Determination of Empirical Formulas" section, the page states, "Thus, this compound may be represented by the formula $\text{C}_{0.142}\text{H}_{0.248}$. Per convention, formulas contain whole-number subscripts, which can be achieved by dividing each subscript by the smaller subscript: $\text{C}_{0.142/0.142}\text{H}_{0.284/0.142}$ or CH_2 . The issue here is that you state the compound formula as $\text{C}_{0.142}\text{H}_{0.248}$, despite the mol H already being evaluated as 0.284, not 0.248. | Revise $\text{C}_{0.142}\text{H}_{0.248}$ to $\text{C}_{0.142}\text{H}_{0.284}$. | Other factual inaccuracy in content |

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| Chapter 3 Composition of Substances and Solutions: Section 3.2 Determining Empirical and Molecular Formulas | Problem 33 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' | In part b of exercise 33, revise as follows: 8. Calculate the following to four significant figures: (b) the percent composition of photographic fixer solution ("hypo"), Na ₂ S ₂ O ₃ | General/pedagogical suggestion or question |
| Chapter 3 Composition of Substances and Solutions: Section 3.2 Determining Empirical and Molecular Formulas | Example 3.12 in the solution, where it mentions "The molar amounts of carbon and hydrogen in a 100-g sample are calculated by dividing each element's mass by its molar mass:" it should be oxygen instead of hydrogen. | Our reviewers accepted this change. | Typo |
| Chapter 3 Composition of Substances and Solutions: Section 3.2 Determining Empirical and Molecular Formulas | In "Determination of Empirical Formulas" in the sentence that leads into the first worked problem, it states, "Consider a sample of compound determined to contain 1.71g C...." However, in the worked problem the mass used is not 1.71g C but the mass 1.17g C is used. Please correct this error. I have already had my students complaining about this. The error is in the current version on-line. Thanks for your help, Dr. Palamara | Change "1.17 g" to "1.71 g" in the first equation. | Typo |
| Chapter 3 Composition of Substances and Solutions: Section 3.2 Determining Empirical and Molecular Formulas | Change "Hydrogen" to "Oxygen". | Revise as indicated. | Other |
| Chapter 3 Composition of Substances and Solutions: Section 3.2 Determining Empirical and Molecular Formulas | Exercise 35 asks to find the percent composition of ammonia of a certain chemical formula containing no calcium; yet, I find that in the detailed solution guide that calcium's atomic mass is used in the calculations to find the answer. I believe the answer is 69.2% rather than 38.2%. Additionally, the provided answer is unreasonable based on the given information in the problem. Please go over this problem in case my answer is incorrect as I cannot check that due to the error in the key. | The solution manual will be updated. | Incorrect answer, calculation, or solution |
| Chapter 3 Composition of Substances and Solutions: Section 3.3 Molarity | For problem 63 d the unit in the calculation should have been changed from mL to L, or conversely, the numerical values should have been left the same as in the problem. | Revise the solution as needed. | Typo |
| Chapter 3 Composition of Substances and Solutions: Section 3.3 Molarity | In the section on dilution "n" being a symbol for moles is never defined. I don't think this is defined anywhere earlier in the text either. I suggest making it clear in this section that "n" is a symbol for moles. | Revise the sentence beginning "According to the definition of molarity,..." to "According to the definition of molarity, the number of moles of solute in a solution (n) is equal to the product of the solution's molarity (M) and its volume in liters (L):" | General/pedagogical suggestion or question |
| Chapter 3 Composition of Substances and | chapter 3 exercise #51 3.8×10^{-6} when calculating this, it does not match the answer key. the problem should be 10^{-5} or the answer key as 10^{-7} | In part (b), revise " 10^{-6} " to " 10^{-7} " and " 10^{-4} " to " 10^{-5} ". | Incorrect answer, calculation, or solution |

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| Solutions: Section 3.3 Molarity | | | |
| Chapter 3 Composition of Substances and Solutions: Section 3.3 Molarity | Problem #47 - the molar mass should be 74.09 instead of 79.09. Problem #51 - should read b) should be 3.8×10^{-6} , not 10^{-5} . Thank you! | Revise problem 51 question stem part (b) to 3.8×10^{-6} . The problem 47 solution will be updated in the solution manual. | Incorrect answer, calculation, or solution |
| Chapter 4 Stoichiometry of Chemical Reactions: Section 4.1 Writing and Balancing Chemical Equations | Table 4.1 has been updated to list all of the group I cations as soluble, but ammonium (NH_4^+), which is also always soluble, has been omitted. Please modify the table to contain all group I ions plus ammonium in the 'always soluble' section. | Revise to add " NH_4^+ " before "group I cations:". | Other factual inaccuracy in content |
| Chapter 4 Stoichiometry of Chemical Reactions: Section 4.2 Classifying Chemical Reactions | #20 c) C is oxidized from -2 to +4 | The solution will be updated. | Incorrect answer, calculation, or solution |
| Chapter 4 Stoichiometry of Chemical Reactions: Section 4.2 Classifying Chemical Reactions | Example 4.7 actual text: chlorate ions, ClO_4^- ; correction: chlorate ion, ClO_3^- | Our reviewers accepted this change, and it will be included in the next print cycle. | Typo |
| Chapter 4 Stoichiometry of Chemical Reactions: Section 4.2 Classifying Chemical Reactions | original text: if the compound was ionic; correction: if the compound were ionic | Our reviewers accepted this change, and it will be included in the next print cycle. | Typo |
| Chapter 4 Stoichiometry of Chemical Reactions: Section 4.2 Classifying Chemical Reactions | Example 4.5, solution part (a) should be referring to guideline 3 for the oxidation number of H, not guideline 1 | Revise "guideline 1" to "guideline 3". | Typo |
| Chapter 4 Stoichiometry of Chemical Reactions: Section 4.2 Classifying Chemical Reactions | AgF is soluble in water, and should not form a precipitate. The text says that it would form a precipitate. This does not agree with the information provided in the solubility table on page 183. | In Table 4.1, revise " Pb^{2+} , Fe^{3+} , and Ag^+ " to " Pb^{2+} and Fe^{3+} ". Also revise "fluoride" to "chloride" and "F" to "Cl" in the text and equation below the table. Replace "one of the exceptions to the general solubility of fluoride salts" with "insoluble". | Incorrect answer, calculation, or solution |
| Chapter 4 Stoichiometry of Chemical Reactions: Section 4.2 Classifying Chemical Reactions | In EXAMPLE 4.7 under check your learning portion, the text reads "In basic solution, molecular chlorine, Cl_2 , reacts with hydroxide ions, OH^- , to yield chloride ions, Cl^- , and chlorate ions, ClO_4^- ." The subscript should be 3 instead of 4 for chlorate ions. | This issue was addressed in another report and is correct in webview. | Typo |
| Chapter 4 Stoichiometry of Chemical Reactions: | Under Precipitation Reactions and Solubility Rules, When demonstrating on how to use the solubility guidelines (Table 4.1), the textbook gives an example of mixing solutions of | Revise the line of Table 4.1 beginning "compounds with group 2" to "compounds with | Other factual inaccuracy in content |

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| Section 4.2 Classifying Chemical Reactions | silver nitrate and sodium fluoride. One of the products in this chemical reaction is silver fluoride, AgF. According to the textbook, "The solubility guidelines indicate... AgF is one of the exceptions to the general solubility of fluoride salts." However, in Table 4.1, the only exceptions to the solubility rule written for fluoride are "compounds with group 2 metal cations, Pb(2+ charge) and Fe(3+ charge)." | group 2 metal cations, Pb ²⁺ , Fe ³⁺ , and Ag ⁺ ". | |
| Chapter 4 Stoichiometry of Chemical Reactions: Section 4.2 Classifying Chemical Reactions | It seems like there's an error at because in the instruction it's said ClO ₄ ⁻ , but in the answer it's ClO ₃ ⁻ . The correct answer for the problem is therefore: 4Cl ₂ + 8OH ⁻ => 7Cl ⁻ + ClO ₄ ⁻ + 4H ₂ O | Right before the "HINT" revise "ClO ₄ ⁻ " to "ClO ₃ ⁻ ". The answer is then correct. | Incorrect answer, calculation, or solution |
| Chapter 4 Stoichiometry of Chemical Reactions: Section 4.2 Classifying Chemical Reactions | Ch. 4 End of Chapter Questions #37 E needs to specify if the solution is acidic or basic. | Add the following to the end of the answer: "(in basic solution)". | Other factual inaccuracy in content |
| Chapter 4 Stoichiometry of Chemical Reactions: Section 4.2 Classifying Chemical Reactions | Chapter 4 Question 34 stated SO ₃ + H ₂ O produces "liquid hydrogen sulfate" as the only product, "liquid hydrogen sulfate" should be "sulfuric acid". | Revise "hydrogen sulfate" to "dihydrogen sulfate". | Typo |
| Chapter 4 Stoichiometry of Chemical Reactions: Section 4.3 Reaction Stoichiometry | The chemical formula for chlorate ions is ClO ₃ ⁻ , not ClO ₄ ⁻ . | Our reviewers accepted this change, and it will be included in the next print cycle. | Typo |
| Chapter 4 Stoichiometry of Chemical Reactions: Section 4.3 Reaction Stoichiometry | Exercise # 67 The problem indicates that the solution should start with 1000 g of toluene, not 100 g as shown in work. | This will be corrected in the solution manual. | Typo |
| Chapter 4 Stoichiometry of Chemical Reactions: Section 4.3 Reaction Stoichiometry | The back of the book answer for question #57 should have only four significant figures and be 161.4 mL. | Revise the answer to 161.4 mL. | Incorrect answer, calculation, or solution |
| Chapter 4 Stoichiometry of Chemical Reactions: Section 4.3 Reaction Stoichiometry | Answer key at the back of the book for Chapter 4, question 45 (d). The correct answer should be 769 mol H ₂ O and 13.8 kg of H ₂ O. This question requires students to answer question 44 first for this chapter. In the instructors solution manual, the molar mass of C ₂ H ₂ is written as 28.054 g/mol. Instead, the molar mass should be 26 g/mol. Hence the wrong numbers in the key. | Revise "713 mol" to "768 mol" and "12.8 kg" to "13.8 kg". | Incorrect answer, calculation, or solution |
| Chapter 4 Stoichiometry of Chemical Reactions: Section 4.4 Reaction Yields | The back of the book answer for question #73 should have four significant figures and be 86.53%. | Revise the answer to 86.56%. | Incorrect answer, calculation, or solution |

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| Chapter 4 Stoichiometry of Chemical Reactions: Section 4.5 Quantitative Chemical Analysis | Example 4.14, Check Your Learning QuestionThe question states the reaction containing potassium permanganate, KMnO_4 , however the molecular equation for the reaction in the question has only permanganate. | Add the following after " KMnO_4 ": "(see net ionic equation below)". | Other factual inaccuracy in content |
| Chapter 4 Stoichiometry of Chemical Reactions: Section 4.5 Quantitative Chemical Analysis | Example 4.14, Check Your Learning The written explanation refers to a titrate of potassium permanganate, however the chemical equation given shows no potassium. | This issue was addressed in another report and has been corrected in webview. | Typo |
| Chapter 4 Stoichiometry of Chemical Reactions: Section 4.5 Quantitative Chemical Analysis | The problem involves MgSO_4 , but the associated flow chart indicates CaSO_4 . | The image in the solution will be updated. | Typo |
| Chapter 4 Stoichiometry of Chemical Reactions: Section 4.5 Quantitative Chemical Analysis | Exercises #89 in the balanced equation the product H_2PO_4 should be H_3PO_4 . | This will be updated in the solution manual. | Typo |
| Chapter 4 Stoichiometry of Chemical Reactions: Section 4.5 Quantitative Chemical Analysis | #94 Formula for KHP is $\text{KHC}_8\text{H}_4\text{O}_4$ and product is $\text{KNaC}_8\text{H}_4\text{O}_4$. Incorrect formulas written are $\text{KHC}_8\text{H}_5\text{O}_4$ and $\text{KNaC}_8\text{H}_5\text{O}_4$. | Revise " H_5 " to " H_4 ". | Incorrect answer, calculation, or solution |
| Chapter 4 Stoichiometry of Chemical Reactions: Section 4.5 Quantitative Chemical Analysis | Exercise #88 H_2PO_4 should be H_3PO_4 | Revise " H_2 " to " H_3 ". | Typo |
| Chapter 5 Thermochemistry: Section 5.1 Energy Basics | Example 5.1 Check Your Learning The " $5.07 \times 10^4\text{J}$ iron skillet" written in the question should be " $5.02 \times 10^2\text{g}$ iron skillet" if my calculation is correct. | This issue was addressed in another report and will be corrected in webview. | Typo |
| Chapter 5 Thermochemistry: Section 5.1 Energy Basics | The phrase "water has a relatively high specific heat (about $4.2 \text{ J/g } ^\circ\text{C}$ for the liquid and $2.09 \text{ J/g } ^\circ\text{C}$ for the solid))". "Water" at the beginning of the sentence needs a capital letter, and there are 2 brackets at the end ")")" when only one is needed. | Our reviewers accepted this change, and it will be included in the next print cycle. | Typo |
| Chapter 5 Thermochemistry: Section 5.1 Energy Basics | Example 5.1 Check Your Learning In the problem they state that the heat added to a 502 g iron skillet, with a specific heat of $0.449 \text{ J/g-Celsius}$, to raise its temperature from 25 Celsius to 250 Celsius is of $5.12 \times 10^6 \text{ J}$. To get the result you should multiply $(0.449 \text{ J/g-Celsius})(502 \text{ g})(250 \text{ Celsius} - 25 \text{ Celsius})$ which equals 50714.55 J , but using the only needed significant figures the answer should be $5.07 \times 10^4 \text{ J}$. | Revise the answer to " $5.07 \times 10^4 \text{ J}$ ". | Incorrect answer, calculation, or solution |
| Chapter 5 Thermochemistry: | A "content" error. On p. 470 of Chemistry: Atoms 1st. 2nd Ed. On Example 9.1 - "Check your learning" - The question reads - How much heat, in joules, must be added to a $5.07 \times$ | Revise " $5.07 \times 10^4 \text{ J}$ iron skillet" to " 502 g iron skillet". | Incorrect answer, |

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| Section 5.1 Energy Basics | 10 ⁴ J iron skillet.... The answer is 5.07 x 10 ⁴ J. According to the calculation, the question should read "How much heat, in Joules, must be added to a 502 g iron skillet...." | | calculation, or solution |
| Chapter 5 Thermochemistry: Section 5.1 Energy Basics | Check Your Learning: How much heat, in joules, must be added to a 5.07 x 10 ⁴ J iron skillet to increase its temperature from 25 °C to 250 °C? The specific heat of iron is 0.449 J/g °C. Solution: 5.07 x 10 ⁴ J The unit for 5.07x10 ⁴ should be measured in g, not J. the answer should be closer to 5.12x10 ⁶ if the number above is in g. | Revise the unit for 5.07 x 10 ⁴ to g and the answer to 5.12 x 10 ⁶ J. | Incorrect answer, calculation, or solution |
| Chapter 5 Thermochemistry: Section 5.2 Calorimetry | Example 5.7 - Bomb Calorimetry - Check Your Learning Answer should be -39.0 kJ indicating it's an exothermic reaction. | Revise the answer to "q _{rx} = -39.0 kJ (the reaction produced 39.0 kJ of heat)". | Incorrect answer, calculation, or solution |
| Chapter 5 Thermochemistry: Section 5.2 Calorimetry | Example 5.5 - Check Your Learning The answer should be - 1.34 X 10 ³ J indicating it's an exothermic reaction. | Revise the answer to "1.3 kJ". | Incorrect answer, calculation, or solution |
| Chapter 5 Thermochemistry: Section 5.2 Calorimetry | Check Your Learning of Exercise 5.7 The fuel burned it Benzene and not Glucose as the question asks. Replace Glucose by Benzene. | Revise "glucose" to "benzene". | Typo |
| Chapter 5 Thermochemistry: Section 5.3 Enthalpy | The second line of "692g C ₈ H ₁₈ " should be changed to "6.07 mol C ₈ H ₁₈ ". | Revise "692g" to "6.07 mol". | Typo |
| Chapter 5 Thermochemistry: Section 5.3 Enthalpy | The value in Appendix G for HNO ₃ (aq) is -206.64 kJ/mol. The solution of Example 5.15 shows -207.4 in the first line (2nd value). In the 3rd line of "Supporting Why the General Equation Is Valid" lists 2*-207.4=-414.8 kJ rather than 2*-206.64=413.28 kJ | This issue was addressed in another report and will be corrected in webview. | Typo |
| Chapter 5 Thermochemistry: Section 5.3 Enthalpy | Example 5.8, the sentence "Write a balanced thermochemical equation for the reaction of one mole of HCl.?" in example 5.8 seems to have an extraneous question mark. The online version of the book seems to have this same issue. | Our reviewers accepted this change. | Typo |
| Chapter 5 Thermochemistry: Section 5.3 Enthalpy | Exercise #83 Ethylene should be C ₂ H ₄ | Revise C_2H_2 to C_2H_4. | Typo |
| Chapter 5 Thermochemistry: Section 5.3 Enthalpy | Example 5.13 shouldn't Cl ₂ + 1/2 Cl ₂ be 3/2 Cl ₂ ? | Revise 1/2 Cl_2 to 3/2 Cl_2. | Typo |
| Chapter 5 Thermochemistry: Section 5.3 Enthalpy | end of chapter problem 59 The solution proposed in the key yield an overall reaction equation that is balanced in nitrogen but not in O or H. Also the overall equation for the Ostwald process does not match what one would get with the solution in the key. The overall reaction for the Ostwald process is 12 NH ₃ + 21 O ₂ -> 8 HNO ₃ + 4 NO + 14 H ₂ O. | This solution will be updated in the solution manuals. | Incorrect answer, calculation, or solution |
| Chapter 5 Thermochemistry: Section 5.3 Enthalpy | Some of the information in Example 5.15 does not agree with Appendix G. First of all the change of enthalpy of formation value for HNO ₃ (aq) is not listed in Appendix G. The value listed in Appendix G for NO(g) is 90.25 but in the example 90.2 is used. The value listed in Appendix G for | Revise Appendix G so the value for H ₂ O(l) is -285.8 and NO(g) is 90.2. Add a row for HNO ₃ in the Appendix. Also | Incorrect answer, calculation, or solution |

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| | H ₂ O(l) is -285.83 but in the example -285.8 is used. Students get confused when the sample problems do not use the same values as in the Appendix. | update the calculations in the example. | |
| Chapter 5 Thermochemistry: Section 5.3 Enthalpy | Question 50 states that the heat capacity of the products is 4.19 J/g C. This should be described as the specific heat instead. Solving the question while treating the number as heat capacity provides an unreasonable temp change of -346 C. Solving it while treating it as specific heat gives a much more reasonable -1.46 C temperature change. | Revise "heat capacity" to "specific heat". | Typo |
| Chapter 5 Thermochemistry: Section 5.3 Enthalpy | Chemistry 2e, Chapter 5 Question #85, answer (b) given in the book is for the volume of O ₂ , but the question was asking the volume of Air, so the answer should be 330Liters/0.21 = 1571 Liters | Revise the answer for part (b) to "1570 L air". | Incorrect answer, calculation, or solution |
| Chapter 5 Thermochemistry: Section 5.3 Enthalpy | Ex. 5.14 For the following reaction: ClF(g) + F ₂ (g) --> ClF ₃ (g) if you use Hess's Law and the equations in the example, as correctly stated in the example, the enthalpy comes out to be -139.2 kJ. If you use the enthalpies of formation in Appendix G of the text, the enthalpy for the above reaction comes out to be -104.5 kJ. If you go to the NIST Webbook to obtain enthalpies of formation, the enthalpy of the above reaction comes out to be -108.58 kJ. I suspect that there is an error or errors in the enthalpies for the reactions given in Ex. 5.14 Suggested correction using the enthalpies of formation from Appendix G of the text, for the reaction 2 ClF(g) + O ₂ (g) --> Cl ₂ O(g) + OF ₂ (g) enthalpy should be +214.0 kJ and for the reaction ClF ₃ (g) + O ₂ (g) --> 1/2 Cl ₂ O(g) + 3/2 OF ₂ (g) enthalpy should be +236.2 kJ | Revise the following numbers in this reaction: "+205.6" and "205.6" to "+214.0" "+266.7" to "+236.2" "+102.8" to "+107.0" "-266.7" to "-236.2" "-139.2" to "-104.5" | Incorrect answer, calculation, or solution |
| Chapter 6 Electronic Structure and Periodic Properties of Elements: Section 6.1 Electromagnetic Energy | I'm troubled that men get mentioned winning the noble prize throughout the textbook... but Dorothy Hodgkin's 1964 Nobel Prize in Chemistry isn't mentioned in her "Portrait of a Chemist". Seems a bit sexist and doesn't set a inclusive tone to skip her awards -- especially when awards for men are mentioned often in the text. | The Portrait of a Chemist box on Dorothy Hodgkin will be updated. | Other |
| Chapter 6 Electronic Structure and Periodic Properties of Elements: Section 6.1 Electromagnetic Energy | I believe the correct answer for the energy in Ch. 6, #11 is 9.505 x 10 ⁻¹⁵ J. | Our reviewers determined there is no error in the answer, however, the solution has been rearranged for clarity in the solution manual. | General/pedagogical suggestion or question |
| Chapter 6 Electronic Structure and Periodic Properties of Elements: Section 6.2 The Bohr Model | #26 show work! Not just the answer. | The full solution will be added. | General/pedagogical suggestion or question |
| Chapter 6 Electronic Structure and Periodic Properties of Elements: Section 6.2 The Bohr Model | "Bohr's model of the hydrogen atom provides insight into the behavior of matter at the microscopic level, but it IS does not account for electron-electron interactions in atoms with more than one electron." -> Delete the "is" in the sentence. | Our reviewers accepted this change, and it will be included in the next print cycle. | Typo |
| Chapter 6 Electronic Structure and Periodic | The text reads "The sizes of the circular orbits for hydrogen-like atoms are given in terms of their radii by the following expression, | Revise "α" to "a" in the text before the equation. | Typo |

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| Properties of Elements: Section 6.2 The Bohr Model | in which a_0 is a constant called the Bohr radius, with a value of 5.292×10^{-11} m." The equation listed uses a_0 , rather than a_0 . | | |
| Chapter 6 Electronic Structure and Periodic Properties of Elements: Section 6.2 The Bohr Model | Question 28 describes multiple hydrogens with electrons in $n = 1, 2, 3, 4$ *orbitals*. This is confusing because the quantum number n refers to the shells of the atom, which contain multiple orbitals. The quantum number m_l would refer to the orbitals. | Revise "orbital" to "orbit" and "orbitals" to "orbits" in section 6.2 and problem 28. | Other factual inaccuracy in content |
| Chapter 6 Electronic Structure and Periodic Properties of Elements: Section 6.2 The Bohr Model | In the teacher solutions to chapter 3 #27, Joules are converted to eV, though the question asks for Joules. Was the question intended to ask for eV? | This solution will be updated. | Incorrect answer, calculation, or solution |
| Chapter 6 Electronic Structure and Periodic Properties of Elements: Section 6.2 The Bohr Model | The answer to Ch. 6, #19 should start as " $\Delta E = E_2 - E_5$ ". The delta is missing. I am actually not sure why for this problem a complete solution is shown and not just the answer like for most other problems. I think that the answer to this question can just simply be "2.856 eV". | Revise to only show the answer, not the full solution. The solution will be updated as needed in the solution manual. | Incorrect answer, calculation, or solution |
| Chapter 6 Electronic Structure and Periodic Properties of Elements: Section 6.3 Development of Quantum Theory | interference "patters" -> "patterns" | Our reviewers accepted this change, and it will be included in the next print cycle. | Typo |
| Chapter 6 Electronic Structure and Periodic Properties of Elements: Section 6.3 Development of Quantum Theory | That h (highlighted one) should be a ' \hbar '. | Revise " h " to " \hbar ". | Typo |
| Chapter 6 Electronic Structure and Periodic Properties of Elements: Section 6.4 Electronic Structure of Atoms (Electron Configurations) | #52 a) 2p needs 3 orbitals shown c) 3d needs 5 orbitals shown | The solution will be updated. | Incorrect answer, calculation, or solution |
| Chapter 6 Electronic Structure and Periodic Properties of Elements: Section 6.4 Electronic Structure of Atoms (Electron Configurations) | In Exercise 63 the electron configurations sometimes have the wrong order, for example, the solution to 63 gives the order as ... 3s, 3p, 3d, 4s, 4p, 4d, 5s ... when it should be ... 3s, 3p, 4s, 3d, 4p, 5s, 4d ... following Madelung's rule. | Revise the solution to $1s^2 2s^2 2p^6 3s^2 3p^4 4s^2 3d^1 4p^6 5s^2 4d^1 10s^2 4f^1 14s^2 10d^1$. | Incorrect answer, calculation, or solution |
| Chapter 6 Electronic Structure and Periodic Properties of | Figure 6.27 the table is supposed to show the electron configuration for each subshell at top right of each element. As such, it gives a $4f^1$ configuration for Ce, $4f^2$ for Pr, $4f^3$ for Nd etc. This is wrong. The correct electron configurations | This figure and caption will be updated. | Other factual inaccuracy in content |

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| Elements: Section 6.4 Electronic Structure of Atoms (Electron Configurations) | are shown on figure 6.29: $4f^3$ for Pr, $4f^4$ for Nd etc. With the exception of La, Ce and Gd for the lanthanides (more exceptions in the case of the actinides), they follow the rule represented figure 6.26, and correspond to electronic configurations $6d^1 4f^n$ for La-Yb and $7s^1 5f^n$ for Ac-No, with no electrons in the d shell. In short, for the purpose of figure 6.27, La and Ac should be seen as part of the f block, and Lu and Lr as part of the d block (irrespective of the larger debate about where to place them in general). Maybe showing the table as in appendix A (with the spaces under Y occupied by La-Lu and Ac-Lr place markers) would provide a more general representation. | | |
| Chapter 6 Electronic Structure and Periodic Properties of Elements: Section 6.4 Electronic Structure of Atoms (Electron Configurations) | Under the header "Electron Configurations and the Periodic Table" and under 3. Inner Transition Metals it says The lanthanide series: lanthanide (La) through lutetium (Lu) The actinide series: actinide (Ac) through lawrencium (Lr) when it should say (stars indicate the error) The lanthanide series: *lanthanum* (La) through lutetium (Lu) The actinide series: *actinium* (Ac) through lawrencium (Lr) | Revise "lanthanide" to "lanthanum" and revise "actinide" to "actinium". | Typo |
| Chapter 6 Electronic Structure and Periodic Properties of Elements: Section 6.4 Electronic Structure of Atoms (Electron Configurations) | At exercise 47, in the answer key, you write the wrong electron configuration for Ca^{2+} | Revise " $Ca^{2+}: 1s^2 2s^2 2p^6$ " to " $Ca^{2+}: 1s^2 2s^2 2p^6 3s^2 3p^6$ ". | Incorrect answer, calculation, or solution |
| Chapter 6 Electronic Structure and Periodic Properties of Elements: Section 6.4 Electronic Structure of Atoms (Electron Configurations) | Within the section Ch 6.4, discussing transition elements, a sentence reads as "The valence electrons (those added after the last noble gas configuration) in these elements include the ns and $(n - 1)$ d electrons." The electrons being referred to are the 'outer' electrons and not the 'valence' electrons. Then, within the instructor's powerpoint slides, where it says the same incorrect sentence, there is an example for Vanadium, discussing it has 5 valence electrons. Again, this should be corrected to say 5 outer electrons and followed up with 2 valence electrons (being the 4s as they can extend furthest from the nucleus). | While our reviewers determined that the current text is consistent with the widespread usage of the term "valence," revisions will be made to the definitions of valence electrons and valence shell in the Key Terms section. Revise the definition of valence electron to "electrons in the high energy outer shell(s) of an atom" and valence shell to "high energy outer shell(s) of an atom". | Other factual inaccuracy in content |
| Chapter 6 Electronic Structure and Periodic Properties of Elements: Section 6.4 Electronic Structure of Atoms (Electron Configurations) | In Figure 5.29 the two s orbitals that are being combined have different phases. When they are added, it should result in an antibonding orbital, and when they are subtracted it should result in a bonding orbital. The figure is inaccurate in its current form. The easy solution is to give both s orbitals the same phase. | This figure will be updated. | Other factual inaccuracy in content |

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| Chapter 6 Electronic Structure and Periodic Properties of Elements: Section 6.4 Electronic Structure of Atoms (Electron Configurations) | The image in figure 8 shows the MO diagram for Be ₂ ⁺ ion having the 2p MO's in the sigma, pi, pi filling (energy) order, but later in the chapter (image 11) the filling (energy) order is pi, pi, sigma. The image could be fixed by changing the bonding order or by changing the molecule to Ne ₂ . | This figure will be updated. | Other factual inaccuracy in content |
| Chapter 6 Electronic Structure and Periodic Properties of Elements: Section 6.4 Electronic Structure of Atoms (Electron Configurations) | Figure 6.28 shows a periodic table with electron configurations. It shows He as having 1 electron when it should have 2. | This figure will be updated. | Typo |
| Chapter 6 Electronic Structure and Periodic Properties of Elements: Section 6.4 Electronic Structure of Atoms (Electron Configurations) | Shouldn't the electron configuration "1s ² 2s ² 2p ⁶ 3s ² 3p ⁶ 3d ¹⁰ 4s ² 4p ⁶ 4d ⁵ " be written in this order? "1s ² 2s ² 2p ⁶ 3s ² 3p ⁶ 4s ² 3d ¹⁰ 4p ⁶ 4d ⁵ " (order change between 3d ¹⁰ and 4s ²) | Revise "1s ² 2s ² 2p ⁶ 3s ² 3p ⁶ 3d ¹⁰ 4s ² 4p ⁶ 4d ⁵ " to "1s ² 2s ² 2p ⁶ 3s ² 3p ⁶ 4s ² 3d ¹⁰ 4p ⁶ 4d ⁵ ". | Typo |
| Chapter 6 Electronic Structure and Periodic Properties of Elements: Section 6.5 Periodic Variations in Element Properties | Figure 6.33's label for Mg is floating away from where it should be and it is unclear which data point it is associated with. It should be in a similar position to the Be label, directly above the data point associated with it. | This figure will be updated to remove the "Mg" label because there is no unambiguous location to place it. | Other |
| Chapter 7 Chemical Bonding and Molecular Geometry: Exercises | Chapter 5: Exercise 85 part b states: (b) Calculate the volume of air at 25 °C and 1.00 atmosphere that is needed to completely combust 25.0 grams of propane. Assume that air is 21.0 percent O ₂ by volume. (Hint: We will see how to do this calculation in a later chapter on gases—for now use the information that 1.00 L of air at 25 °C and 1.00 atm contains 0.275 g of O ₂ per liter.) IT should state that "1.00 L of oxygen at 25 °C and 1.00 atm contains 0.275 g of O ₂ ." | Delete "per liter" from the end of part b. | Typo |
| Chapter 7 Chemical Bonding and Molecular Geometry: Key Equations | The equation for formal charge instead of "# one pair electrons" it should be "# lone pair electrons" | Revise "one" to "lone". | Typo |
| Chapter 7 Chemical Bonding and Molecular Geometry: Section 7.2 Covalent Bonding | Figure 7.4 provides the H-H bond length as 0.74 which is the Internuclear Distance in angstrom but the Internuclear Distance is labeled as picometers (pm). | This figure will be updated. | Typo |
| Chapter 7 Chemical Bonding and Molecular | #32 a) phosphate ion needs one P=O bond c) sulfite ion needs one S=O double bond | The solution will be updated. | Incorrect answer, |

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| Geometry: Section 7.3 Lewis Symbols and Structures | | | calculation, or solution |
| Chapter 7 Chemical Bonding and Molecular Geometry: Section 7.3 Lewis Symbols and Structures | In the section on Double and Triple Bonds, I do not think it is a good idea to use arrows to separate formaldehyde from ethylene and carbon monoxide from cyanide ion. To me the arrow implies that a reaction takes place and formaldehyde is converted into ethylene and carbon monoxide is converted into cyanide which is not true. I suggest deleting the arrows. | These figures will be updated. | General/pedagogical suggestion or question |
| Chapter 7 Chemical Bonding and Molecular Geometry: Section 7.4 Formal Charges and Resonance | #58 in SOO structure, the formal charge of the Oxygen on the far right should = 0 | The solution will be updated. | Incorrect answer, calculation, or solution |
| Chapter 7 Chemical Bonding and Molecular Geometry: Section 7.4 Formal Charges and Resonance | Example 7.8 The Lewis structure that shows a nitrogen-nitrogen triple bond and a nitrogen-oxygen single bond (nitrogen in the center) should also be shown and compared to the others. This one, which puts the negative formal charge on the oxygen, is the most stable (point #4 in the preceding text). | This example will be updated. | General/pedagogical suggestion or question |
| Chapter 7 Chemical Bonding and Molecular Geometry: Section 7.4 Formal Charges and Resonance | The answer to Ch. 7, #47 should not contain the resonance forms for ozone. Only the resonance forms for nitrite should be shown. | This figure will be updated. | Incorrect answer, calculation, or solution |
| Chapter 7 Chemical Bonding and Molecular Geometry: Section 7.4 Formal Charges and Resonance | In the section on using formal charge to predict molecular structure it would better if it said: "...could have three different molecular structures: NCS ⁻ , CNS ⁻ , or CSN ⁻ ." so that the order in the text reflects the same order of the structures in the image below it. | Revise as indicated. | General/pedagogical suggestion or question |
| Chapter 7 Chemical Bonding and Molecular Geometry: Section 7.4 Formal Charges and Resonance | There is a small typo in the section on Electronic Structures of Cations. When discussing the formation of Fe ²⁺ it should say "...by the loss of the 4s electrons..." The word electron should be plural. | Revise as indicated. | Typo |
| Chapter 7 Chemical Bonding and Molecular Geometry: Section 7.4 Formal Charges and Resonance | shortlink http://openstax.org/l/16LewisMake needs new target, as http://firstyear.chem.usyd.edu.au/iChem/lewis.shtml times out | This link will be updated. | Broken link |
| Chapter 7 Chemical Bonding and Molecular Geometry: Section 7.5 Strengths of Ionic and Covalent Bonds | The calculation following table 7.4 is not correct, and the H _{lattice} listed does not match that show in figure 7.13. H _{lattice} =(553.5+76.5+79.4+375.7+328.2)kJ/mol=1413.3kJ/mol Correction that matches what is listed in figure 7.13 H _{lattice} =(553.5+76.5+79.4+375.7-328.2)kJ/mol=756.9kJ/mol | Table 7.4 will be updated, as well as the H _{lattice} calculation. | Incorrect answer, calculation, or solution |
| Chapter 7 Chemical Bonding and Molecular Geometry: Section | #96 b) molecular shape should be tetrahedral | The solution will be updated. -WW SE | Incorrect answer, calculation, or solution |

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| 7.6 Molecular Structure and Polarity | | | |
| Chapter 7 Chemical Bonding and Molecular Geometry: Section 7.6 Molecular Structure and Polarity | #94 b) molecular shape should be see-saw c) SnCl_3^+ needs to be a positive ion with a +1 charge to have the properties listed e) molecular shape should be T-shape | In part C), revise " SnCl_3^- " to " SnCl_3^+ ". The rest of the solution will also be updated. | Incorrect answer, calculation, or solution |
| Chapter 7 Chemical Bonding and Molecular Geometry: Section 7.6 Molecular Structure and Polarity | #106 b) need a lone pair of electrons on the N c) REMOVE the lone pair of electrons on the S d) should be trigonal pyramid, not tetrahedral; Also, one S-O single bond should be a S=O double bond | The solution will be updated. | Incorrect answer, calculation, or solution |
| Chapter 7 Chemical Bonding and Molecular Geometry: Section 7.6 Molecular Structure and Polarity | Figure 7.16 and 7.19 The left column is labeled "Number of electron pairs", but actually describes the "Number of Electron Groups". It is possible, and often occurs that an electron group consists of two or more electron pairs. | Figures 7.16 and 7.19 will be updated to use "region" instead of "pair". | Other factual inaccuracy in content |
| Chapter 8 Advanced Theories of Covalent Bonding: Section 8.2 Hybrid Atomic Orbitals | Example 8.3 - Assigning Hybridization - The nitrogen in urea is not sp^3 hybridized as the example suggests. In organic chemistry students will learn that in amide bonds the N is sp^2 hybridized (because of the neighboring C=O). This also applies to urea. Therefore, urea is an "exception" to the rules that are taught at this point in General Chemistry 1, i.e., Chapter 8. This example should be replaced or one might just ask for the hybridization of carbon. | Revise to avoid nitrogen hybridization in urea. | General/pedagogical suggestion or question |
| Chapter 8 Advanced Theories of Covalent Bonding: Section 8.4 Molecular Orbital Theory | On page 443, under the section titled "Bond Order" second line under Figure 8.83 "O, F, and Ne is greater than that ..." there should be a space so that "O, F, and Ne is greater than that ..." | Our reviewers accepted this change, and it will be included in the next print cycle. | Typo |
| Chapter 8 Advanced Theories of Covalent Bonding: Section 8.4 Molecular Orbital Theory | According to the New York Times article "Walter Kohn, Who Won Nobel in Chemistry, Dies at 93", Walter Kohn died in 2016, so the sentence "Although he is now an emeritus professor, he is still actively working on projects involving global warming and renewable energy" cannot be correct. | Revise the sentence beginning "Although he is now..." to "Dr. Kohn passed away in 2016 at the age of 93." | Other factual inaccuracy in content |
| Chapter 8 Advanced Theories of Covalent Bonding: Section 8.4 Molecular Orbital Theory | shortlink openstax.org/l/16labelorbital needs new target, as http://firstyear.chem.usyd.edu.au/calculators/mo_diagrams.shtml times out | Delete this link to learning feature box. | Broken link |
| Chapter 8 Advanced Theories of Covalent Bonding: Section 8.4 Molecular Orbital Theory | Figure 8.29 contradicts what you discuss in the section on sigma bonding with p-orbitals as well as standard MO representations. As you say, "We indicate the phases by shading the orbital lobes different colors." In figure 8.29, you show s orbitals with two different phases interacting by representing the s-orbitals with different colors. Both should be the same color and the sigma(bonding) should be shaded | In the caption, revise "The plus (+) signs" to "The dots (·)". The figure colors were addressed in a previous report and are correct in webview. | Other factual inaccuracy in content |

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| | with a single color. To help students understand this representation, you would need to mention the difference in colors earlier in the text. There is an additional typo; you say that "The plus (+) signs indicate the locations of nuclei." The image has dots, not +. | | |
| Chapter 8 Advanced Theories of Covalent Bonding: Section 8.4 Molecular Orbital Theory | Particularly figure 8.29 The use of color here is hard to wrap your head around. Color is used in other places to indicate phase (which is confusing for first-year students, especially without consideration of the math, but is at least conceptually defensible). It's not clear what the colors of the constituent s orbitals would mean here. It may indicate two different orbitals, but the spatial arrangement would be better to emphasize that. I have no idea why the bonding orbital has two colors. MOs belong to the whole molecule, so this would seem to confuse the atomic orbital/valence bond picture with the MO picture, and it may create misconceptions around phases of orbitals later on. It's really painful to see. | This figure will be updated. | General/pedagogical suggestion or question |
| Chapter 8 Advanced Theories of Covalent Bonding: Section 8.4 Molecular Orbital Theory | Link to Orbitron website is broken. Message says "account suspended." Is there an updated link? Or even a new source? | This link will be updated. | Broken link |
| Chapter 8 Advanced Theories of Covalent Bonding: Section 8.4 Molecular Orbital Theory | The description for Figure 8.38 in the hardback OpenStax 2016 and the e-book on-line (where it is Chapter 8 Figure 12) both have a typo that is confusing my students. The description states, "Without mixing, the MO pattern occurs as expected, with the σp (sorry that the "P" is not a subscript - I created the sigma symbol with a "P" subscript in Word but after copying and pasting into your errata description box, your box removed the subscript function)orbital energy lower in energy than the σp orbitals...." The only way this sentence can make sense is for the second σp to be πp so that the description matches the figure." Please make this correction because in its current form it makes no sense and the students are confused. Thanks | Revise the caption as indicated. | Typo |
| Chapter 9 Gases: Section 9.1 Gas Pressure | In an example demonstrating pressure as $P = F/A$, the text determines that a figure skater is more likely to fall through ice than an elephant. The text states the pressure of a figure skater on one skate is higher than the pressure of an elephant standing on its four feet. While this is true, it misleads the reader since it implies that average pressure is the only consideration to take to determine if an object will break on ice. In the case of average shear stress (assuming that the ice has a maximum allowable shear stress of ice is 600 kPa or 87 lb/in ²), a 14,000 lb elephant would need ~160 in ² of cross sectional ice for support while the 120 lb skater would need ~1.4 in ² of cross sectional ice for support. Assuming that the circumference of an elephant's foot is ~48 inches, it would take ~192 inches to enclose all four feet in perimeter and require the ice to be about 160 in ² /192 in = 0.83 inches thick. Assuming that a skate blade is ~12 inches long, it would take ~24 inches to enclose one skate in perimeter and require the ice to be about 1.4 in ² /24in = 0.058 inches thick. Given these calculations, it is more likely that the elephant will break the ice by average | Revise the sentence "Let's apply this concept to determine..." to "Let's apply this concept to determine which exerts a greater pressure in Figure 9.3—the elephant or the figure skater?" Also revise the sentence "Even though the elephant is more than..." to "Even though the elephant is more than one hundred-times heavier than the skater, it exerts less than one-half of the pressure." | Other factual inaccuracy in content |

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| | shear stress than the ice skater. Regardless of the relevance of average shear stress to chemistry, there should be a better and more direct example/application of pressure than falling through ice, such that it takes less force to puncture a balloon with a sharp object than a blunt object. | | |
| Chapter 9 Gases: Section 9.1 Gas Pressure | Exercise #9 Answer According to the rules for rounding introduced in Chapter 1, the correct answer to Ch. 9, #9 should be 1.30×10^3 psi. | Revise the answer for Venus to 1.30×10^3 . | Incorrect answer, calculation, or solution |
| Chapter 9 Gases: Section 9.2 Relating Pressure, Volume, Amount, and Temperature: The Ideal Gas Law | #28 wrong answer entirely. Answer should solve for Temperature | The solution will be updated. | Incorrect answer, calculation, or solution |
| Chapter 9 Gases: Section 9.2 Relating Pressure, Volume, Amount, and Temperature: The Ideal Gas Law | #45: The number 278.24 is listed with units of atm. It should be 278.24 K. | The solution manual will be updated. | Incorrect answer, calculation, or solution |
| Chapter 9 Gases: Section 9.2 Relating Pressure, Volume, Amount, and Temperature: The Ideal Gas Law | #29: The answer lists the temperature as -193. It should be -196 as stated in the problem | The solution manual will be updated. | Incorrect answer, calculation, or solution |
| Chapter 9 Gases: Section 9.3 Stoichiometry of Gaseous Substances, Mixtures, and Reactions | it incorrectly says "and the definition of molarity" when it should say "and the definition of molar mass". | Revise "definition of molarity" to "definition of molar mass". | Typo |
| Chapter 9 Gases: Section 9.3 Stoichiometry of Gaseous Substances, Mixtures, and Reactions | Example 9.15 Question asks for N ₂ O mole fraction and partial pressure but the solution is written as N ₂ . | Revise "N ₂ " to "N ₂ O" and "143.6" to "144". | Other factual inaccuracy in content |
| Chapter 9 Gases: Section 9.3 Stoichiometry of Gaseous Substances, Mixtures, and Reactions | Figure 9.22 Y-axis (vapor pressure) is missing its unit. If this graph is to match the data in Table 9.2, the unit should be torr. | This figure will be updated. | Typo |
| Chapter 9 Gases: Section 9.3 Stoichiometry of Gaseous Substances, Mixtures, and Reactions | Figure 9.20 The middle cylinder (red/purple) has P = 600 kPa and the right-hand cylinder (yellow) has P = 450 kPa. These should be switched, as it appears that there are more gas particles in the yellow cylinder. Also, the caption refers to gas A, gas B and gas C, but these letters do not appear in the figure. | This figure will be updated. Also update the caption to "If equal-volume cylinders containing gasses at pressures of 300 kPa, 450 kPa, and 600 kPa are all combined in the same-size cylinder, the total pressure of the gas mixture is 1350 kPa." | Other factual inaccuracy in content |

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| Chapter 9 Gases: Section 9.3 Stoichiometry of Gaseous Substances, Mixtures, and Reactions | The answer for the question 79 was actually for another similar question with slight tweaks on the figures. The 3 figures in Question 79 are 18, 72, 36. The answer in the student manual was meant for 24, 96, 48. | Revise the answer to "XeF_4". The full solution will also be updated in the solution manual. | Incorrect answer, calculation, or solution |
| Chapter 9 Gases: Section 9.3 Stoichiometry of Gaseous Substances, Mixtures, and Reactions | in Example 9.16, Check your learning. The volume of dry oxygen should be 0.538 L, not 0.583 L. $V_{\text{dry}} = V_{\text{wet}} * (P - P_{\text{H}_2\text{O}}) / P$ | Revise the second sentence in check your learning to "What volume would the dry oxygen from this sample..." and revise the answer to 0.537 L. | Typo |
| Chapter 9 Gases: Section 9.3 Stoichiometry of Gaseous Substances, Mixtures, and Reactions | https://openstax.org/l/16SusanSolomon redirect is broken. | This link will be updated. | Broken link |
| Chapter 9 Gases: Section 9.3 Stoichiometry of Gaseous Substances, Mixtures, and Reactions | #66 it would be preferable to use the stoichiometric ratio 4/4 rather than 1/1 so students know where the numbers come from | The solution will be updated. | Incorrect answer, calculation, or solution |
| Chapter 9 Gases: Section 9.4 Effusion and Diffusion of Gases | http://openstax.org/l/16GlobalWarming needs new target, https://www.epa.gov/climatestudents/basics/today/greenhouse-effect.html throws 404 | This link will be updated. | Broken link |
| Chapter 9 Gases: Section 9.5 The Kinetic-Molecular Theory | This chapter makes many references to molecular velocities, but all reasoning relies upon using the Maxwell-Boltzman speed distribution. It looks like a previous errata (ID 6109) addressed this in several figures, but the chapter text and figure captions still refer to velocities. The online version of the text currently uses the word "velocity" or "velocities" 11 times. In all cases, replacing with the words "speed" or "speeds" would be appropriate and improve the accuracy of the arguments. | Replace "velocity" and "velocities" with "speed" and "speeds" throughout the chapter. | Other factual inaccuracy in content |
| Chapter 9 Gases: Section 9.5 The Kinetic-Molecular Theory | Figure 9.31 The label for the scenario of decreased volume says "Volume decreased Wall area decreased = Pressure increased". The pressure increases whenever the volume is decreased even if the wall area remains constant (e.g. half sphere capping a cylinder, invert and push the half sphere inside the cylinder: same wall area, lower volume -> pressure increased). On the other hand, if you increase or decrease the wall area while keeping the volume constant (for example by going from "zig-zag" wall to straight wall), the pressure will not change. In short, the wall area does not influence the pressure. | Revise Boyle's law bullet point to "Boyle's law. If the volume of a given amount of gas at a given temperature is decreased (that is, if the gas is compressed), the molecules will be exposed to a decreased container wall area. Collisions with the container wall will therefore occur more frequently and the pressure exerted by the gas will increase (Figure 9.31)." | Other factual inaccuracy in content |

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| Chapter 10 Liquids and Solids: Introduction | The entire body is repeated twice, i.e. it starts out "Leprosy has been .." and then in the middle it comes back again: "... treatment for leprosy for decades.Leprosy has been ...". Also there is a typo with "her" being written "hr" | typo fixed | Typo |
| Chapter 10 Liquids and Solids: Section 10.1 Intermolecular Forces | Figure 10.14 The base labeled as thymine is uracil (no -CH3 group). | This figure will be updated. | Other factual inaccuracy in content |
| Chapter 10 Liquids and Solids: Section 10.1 Intermolecular Forces | In the key concepts and summary at the end of this section, the following statement is made: "Dipole-dipole attractions result from the electrostatic attraction of the partial negative end of one dipolar molecule for the partial positive end of another." I believe that the word "dipolar" should be replaced with "polar". | Revise as indicated. | General/pedagogical suggestion or question |
| Chapter 10 Liquids and Solids: Section 10.2 Properties of Liquids | Problem # 24 It looks like for the shown 3-d structure of acetone the carbon atom geometry is tetrahedral. It should be optimized or rearranged to be trigonal planar. | This figure will be updated. | Other factual inaccuracy in content |
| Chapter 10 Liquids and Solids: Section 10.3 Phase Transitions | In the series of pictures in Figure 10.22, the pressure gauge indicates an increase in pressure. However, the mercury level in the manometer does not change. This seems inconsistent. | The figure will be updated. | Other factual inaccuracy in content |
| Chapter 10 Liquids and Solids: Section 10.4 Phase Diagrams | example 10.12 the answer is for 50 k Pa not 500 k Pa | Revise "500" to "50". | Typo |
| Chapter 10 Liquids and Solids: Section 10.4 Phase Diagrams | Example 10.11 b) The questions asks what is the phase of CO2 at -60 °C and 1000 kPa. The answer given is solid, when it should be liquid. To keep the answer as solid (all other answers are either liquid or gas), use -90 °C instead. | Revise as indicated. | Incorrect answer, calculation, or solution |
| Chapter 10 Liquids and Solids: Section 10.5 The Solid State of Matter | After Figure 10.388, it says "Crystalline solids are generally classified according the nature of the forces that hold its particles together." It should say "to" after according. | This issue was addressed in another report and will be corrected in webview. | Typo |
| Chapter 10 Liquids and Solids: Section 10.6 Lattice Structures in Crystalline Solids | Example 10.19 In the Check Your Learning part of the "Using the Bragg Equation" example, the answer currently given by OpenStax is 21.9 degrees. This can only be possible if the angle is for second order diffraction not first order. The problem asks for the angle for the first order diffraction which would be 10.8 degrees not 21.9 degrees as currently stated in OpenStax on-line. | Revise the answer to 10.8°. | Incorrect answer, calculation, or solution |
| Chapter 11 Solutions and Colloids: Section 11.1 The Dissolution Process | The sentence "Ammonium nitrate (NaNO3) is one such example and is used to make instant cold packs for treating injuries like the one pictured in Figure 11.5" is an example of a misplaced modifier. Figure 11.5 doesn't illustrate an injury, it illustrates a cold pack. | Revise "instant cold packs for treating injuries like the one pictured in Figure 11.5." to "instant cold packs like the one pictured in Figure 11.5, which are used for treating injuries. | General/pedagogical suggestion or question |
| Chapter 11 Solutions and Colloids: Section 11.1 The Dissolution Process | Chapter 11 End-Of-Chapter 48 The solution has the incorrect power of 10 and the incorrect sig figs. The molar mass is given as 5700 (2sf), so the answer is limited to 2 sig figs. The correct answer is 4.3×10^3 atm (not -4). thanks SB | The solution will be updated. | Incorrect answer, calculation, or solution |

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| Chapter 11 Solutions and Colloids: Section 11.3 Solubility | Example 11.2 - Thermal Pollution and Oxygen Solubility In the first step of the solution to this problem, it says "First, compute the Henry's law constant for oxygen in water at the specified temperature of 30.0 °C (see Figure 11.19)." 1.) Just from the perspective of clarity, nothing in the reading to his point actually explains how to do this. 2.) The referenced Figure 11.19, has nothing to do with the Henry's Law. It is a picture of a laboratory distillation unit. 3.) There is a graph in Figure 11.8 (which would probably be the more appropriate figure to reference) that contains solubilities of gases in water. However, your Y-axis could probably stand to be presented differently if students are expected to use that. Going from a value of 1.0×10^{-3} mol/L to 2.0×10^{-3} mol/L makes it very difficult come back with a figure as precise as 1.15×10^{-3} mol/L, which is what was used in the solution. | Revise "compute" to "estimate". Replace the three occurrences of "1.15" with "1.2". Replace the two occurrences of 1.95" with "2.0". Replace "6.2" with "6.4". | Other factual inaccuracy in content |
| Chapter 11 Solutions and Colloids: Section 11.3 Solubility | Example 11.2 requires students to used Figure 11.8. But this information isn't mentioned until the solution (to be corrected from 11.19 see errata ID 12278 to be corrected in Spring 2021) The question needs to refer students to this graph so that they don't have to read the solution to find out. Thermal Pollution and Oxygen Solubility A certain species of freshwater trout requires a dissolved oxygen concentration of 7.5 mg/L. Could these fish thrive in a thermally polluted mountain stream (water temperature is 30.0 °C, partial pressure of atmospheric oxygen is 0.17 atm)? ***CHANGE HERE*** You should refer to Figure 11.8. ***END CHANGE*** Not that this change would mean the solution to the problem would no longer need to mention Figure 11.8. | Add the following to the end of the question: "Hint: Use the data in Figure 11.8 to estimate a value for the Henry's law constant at this temperature." | General/pedagogical suggestion or question |
| Chapter 11 Solutions and Colloids: Section 11.3 Solubility | See Suggestion ID 12278 to be changed in Spring 2021 for background Example 11.2 asks students to use values read from Figure 11.8 to solve the problem. The figure is currently only marked at 1.0 and 2.0. Additional horizontal lines (perhaps in a lighter grey, but not labeled on the y-axis. "minor horizontal gridlines") would help students estimate the values, especially at the precision referred to in the given solution. Gridlines at least every 0.2, and perhaps every 0.1, would allow all students to make the estimate near 1.15. | Revise the sentence "First, estimate the Henry's law..." to "First, estimate the Henry's law constant for oxygen in water at the specified temperature of 30.0 °C (Figure 11.8 indicates the solubility at this temperature is approximately ~ 1.2 mol/L)." | General/pedagogical suggestion or question |
| Chapter 11 Solutions and Colloids: Section 11.3 Solubility | Example 11.2 The students should be directed to Figure 11.8 (NOT Figure 11.19) to get the "Henry's law constant for oxygen in water at the specified temperature of 30.0 °C" | Our reviewers accepted this change. | Typo |
| Chapter 11 Solutions and Colloids: Section 11.4 Colligative Properties | The typo is on example 11.10. It should say 0.30 mol/L, but it instead says 0.03 mol/L. | Revise "0.03" to "0.30". | Typo |
| Chapter 11 Solutions and Colloids: Section 11.4 Colligative Properties | there are two equations after the first paragraph. These have the charges for the ions on the product side of each as subscripts. These should be superscripts. | Revise the indicated subscripts to superscripts. | Typo |
| Chapter 11 Solutions and | In example 11.10 the 0.30 M solution of glucose in water became 0.03mol/L in the solution to the problem. | Revise "0.03" to "0.30". | Typo |

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| Colloids: Section 11.4 Colligative Properties | | | |
| Chapter 11 Solutions and Colloids: Section 11.4 Colligative Properties | Exercise #47b 0.0363M and not 0.363M | In the solution, "0.363" will be updated to "0.0363". | Typo |
| Chapter 11 Solutions and Colloids: Section 11.4 Colligative Properties | Near the end of Example 11.3 on page 619 in the PDF version the problem says "Finally, calculate molarity per its definition" when in this example we are calculating molality. The remainder of the problem correctly says molality, but there is an incorrect part that says we are looking for molarity. | Revise "calculate molarity" to "calculate molality". | Typo |
| Chapter 11 Solutions and Colloids: Section 11.4 Colligative Properties | In Chapter 11, pg. 649, Exercise 57 Kb is 2.43 when it should be 2.34 | Our reviewers accepted this change. | Typo |
| Chapter 11 Solutions and Colloids: Section 11.4 Colligative Properties | In Chemistry Atoms First Chapter 11 Solutions Manual, an error occurred on problem 57. The Kb in the problem (2.43) and the Kb (2.34) in the answer are reversed. The question is attached below: 57. A sample of sulfur weighing 0.210 g was dissolved in 17.8 g of carbon disulfide, CS ₂ (K _b = 2.43 °C/m). If the boiling point elevation was 0.107 °C, what is the formula of a sulfur molecule in carbon disulfide (assuming ideal solution behavior)? Solution The molality is mol S = 4.57 m 0.0178 kg = 8.13 10 ⁻⁴ mol The atomic mass of sulfur is 32.066. The formula for the sulfur molecule is S ₈ . | Revise the value of K _b in the problem from "2.43" to "2.34". | Incorrect answer, calculation, or solution |
| Chapter 11 Solutions and Colloids: Section 11.4 Colligative Properties | Example 11.5 it is 1.04 kg soln and not 1.02 kg solution | Replace "1.02" with "1.04", replace "0.92" with "0.94", and replace "0.60" with "0.59". | Typo |
| Chapter 12 Kinetics: Key Equations | The equations for half-life are missing the order. They should be zero-order, first-order, and second-order in place of the blanks. sb | Replace first blank with "zero," second blank with "first," and third blank with "second." | Typo |
| Chapter 12 Kinetics: Section 12.1 Chemical Reaction Rates | Chapter 12 problem 2. Ozone decomposes... 2 O ₃ (g) → 3 O ₂ (g). The rate expression in the answer key is missing the 1/3 for the O ₂ portion. | The solution manual will be updated. | Incorrect answer, calculation, or solution |
| Chapter 12 Kinetics: Section 12.1 Chemical Reaction Rates | The sentence preceding the 2NH ₃ → N ₂ + H ₂ reaction appears to have been cut off, and reads only 'the reaction represented by the following equation:'. A possible complete sentence would be: 'For example, consider the decomposition of ammonia, represented by the following equation:'. . | Revise "the reaction represented by..." to "Consider the reaction represented by..." | Other |
| Chapter 12 Kinetics: Section 12.2 Factors Affecting Reaction Rates | 2 minor errors: a) in 'Link to Learning', phosphorus is spelled wrong (i.e. phosphorous instead of phosphorus). b) Under the 'Presence of a Catalyst' section, the chemical reaction indicates that dilute hydrogen peroxide (H ₂ O ₂) is liquid (l) | Error a) was addressed in a previous report and is correct in webview. For error b), revise "(l)" to "(aq)". | Typo |

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| | rather than aqueous (aq). The reaction should read: $2\text{H}_2\text{O}_2(\text{aq}) \rightarrow 2\text{H}_2\text{O}(\text{l}) + \text{O}_2(\text{g})$ | | |
| Chapter 12 Kinetics: Section 12.3 Rate Laws | Exercise #15 "in what direction" should be removed from the question since this is dealing with kinetics, not equilibrium. It should be something like "How much will each of the following changes affect the rate of the reaction:" | Revise the question stem to "How will the rate of reaction change for the process:" | Typo |
| Chapter 12 Kinetics: Section 12.3 Rate Laws | Ch 12 problem 25. The units in the table are given as mol/L rather than the more standard mol L ⁻¹ . This is ok, but in the first set of units there is an extra power of 1 (very nonstandard). SB | Delete superscript "1" in the first column. | Typo |
| Chapter 12 Kinetics: Section 12.4 Integrated Rate Laws | Example 12.12 The half-life of the second order reaction was incorrectly calculated. The product $k[\text{A}]_0$ was calculated as 0.01152 min ⁻¹ but the author forgot to take the reciprocal of this product, which should be 86.8 min. Because the half-life is best expressed in minutes, the introductory text should read: "What is the half-life for the butadiene dimerization reaction described in Example 17.8?" and not "What is the half-life (ms) for the butadiene dimerization reaction described in Example 17.8?" | Delete "(ms)" in the first sentence. Revise the answer to "86.8 min". | Incorrect answer, calculation, or solution |
| Chapter 12 Kinetics: Section 12.4 Integrated Rate Laws | In example 12.12 from this Chemistry textbook the first answer is just a duplicate of the answer for the second question. The correct answer for the butadiene dimerization reaction is ~86.81 minutes, or 87 minutes if using only 2 sig figs. Hopefully this can be fixed since it caused quite a bit of confusion for me. Thank you for making such great material available to all! | Revise "18 min" to "87 min". | Incorrect answer, calculation, or solution |
| Chapter 12 Kinetics: Section 12.4 Integrated Rate Laws | The answer given for the Check Your Learning problem after Example 12.12 is incorrect. The answer should be 18 minutes (not 86.8 minutes). | Revise the answer to "18 min". | Incorrect answer, calculation, or solution |
| Chapter 12 Kinetics: Section 12.4 Integrated Rate Laws | Example 12.12 There is an arithmetical error. $1/(0.0576 \text{ L/mol/min} * 0.200 \text{ mol/L}) = 86.8 \text{ min}$. The example erroneously shows 0.0115 min, which is the reciprocal of the correct solution. The example then converts the incorrect solution to ms, which doesn't make sense given that the correct solution is more convenient in minutes. | Revise "0.0115 min" to "86.8 min". Delete the second equation in the solution. | Incorrect answer, calculation, or solution |
| Chapter 12 Kinetics: Section 12.4 Integrated Rate Laws | Close to the beginning of the "First Order Reactions" section (before EXAMPLE: 12.6) Where it says: "For mathematical convenience, this equation may be rearranged to other formats, including direct and indirect proportionalities: $\ln([\text{A}]_t[\text{A}]_0) = kt$ or $\ln([\text{A}]_0[\text{A}]_t) = -kt$ The negative sign is incorrect. They should be written as: $\ln([\text{A}]_t[\text{A}]_0) = -kt$ or $\ln([\text{A}]_0[\text{A}]_t) = kt$ The equation is correctly written and used in EXAMPLE 12.6 below the error. | Revise "kt" to "-kt" and "-kt" to "kt". | Typo |
| Chapter 12 Kinetics: Section 12.4 Integrated Rate Laws | Q47 The date for radio-carbon testing assumes the 2015 publishing date of the text to be used. The year could be included in the question: In 2015, the skeleton of King Richard III was found under a parking lot in England. If tissue samples from the skeleton were found to contain about 93.79% of the carbon-14 expected in living tissue, what year did King Richard III die? The half-life for carbon-14 is 5730 years. | Revise this question stem to "In 2012, the skeleton..." | General/pedagogical suggestion or question |

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| Chapter 12 Kinetics: Section 12.4 Integrated Rate Laws | The solutions do not answer the question which is to determine the k value. By saying the slope = a value without then saying k= value the problem is not complete. sb | The correct answer will be updated. | Incorrect answer, calculation, or solution |
| Chapter 12 Kinetics: Section 12.4 Integrated Rate Laws | To follow up on "16178" about the answer to Chapter 12 Problem 33 in the answers the y-axis is mislabeled and should instead be "ln [SO ₂ Cl ₂] (M)" sb | This figure will be updated. | Typo |
| Chapter 12 Kinetics: Section 12.4 Integrated Rate Laws | Answer key for Chapter 12 Problem 33 The graph is fine, but the k value is given as negative. The slope itself is negative, but k is positive (slope = -k, a neg slope has a positive k for zero and first order). SB | The correct answer will be updated. | Incorrect answer, calculation, or solution |
| Chapter 12 Kinetics: Section 12.4 Integrated Rate Laws | Answer for Chapter 12 #44 for half life is given as: 1.67 × 10 ³ s. The answer in the instructors solution manual is give as: 1.16 × 10 ³ . The instructors solution manual is correct, the answer in the text book is incorrect. | Revise the answer from "1.67" to "1.16". | Incorrect answer, calculation, or solution |
| Chapter 12 Kinetics: Section 12.5 Collision Theory | The negative sign is missing in slope calculation where 2.2 × 10 ⁴ is the answer. | Revise as indicated. | Incorrect answer, calculation, or solution |
| Chapter 12 Kinetics: Section 12.6 Reaction Mechanisms | Example 12.14 The reaction mechanism sums to the overall reaction in this example correctly. But the slow step will impart a one headed arrow on the overall reaction, so the equilibrium arrow should be switched for a one-headed arrow in the overall reaction. | Revise "⇌" to "→". | Typo |
| Chapter 12 Kinetics: Section 12.6 Reaction Mechanisms | Example 12.14 includes 3 places where reaction arrows are incorrect. Each is highlighted in the attached pdf. In two places, equal signs should be replaced with equilibrium reaction arrows. In one place, the reaction arrow is missing completely. The reactions are: NO(g) + Cl ₂ (g) [EQUILIBRIUM ARROWS] NOCl ₂ (g), then 2NO(g) +Cl ₂ (g) [ONE-HEADED ARROW] 2NOCl(g), finally F ₂ (g) [EQUILIBRIUM ARROWS] 2F(g) | Replace the equal sign (=) with equilibrium arrows (⇌) as indicated and add the missing equilibrium arrows. | Typo |
| Chapter 12 Kinetics: Section 12.6 Reaction Mechanisms | Answer key for Chapter 12 Problem 74c The units of the answer are incorrect. They should be mol ⁻² L ² min ⁻¹ . The negative sign with Litres is incorrect. sb | The correct answer will be updated. | Typo |
| Chapter 12 Kinetics: Section 12.6 Reaction Mechanisms | Chapter 12 End-of-Chapter 71c The equation given is not a balanced equation which makes the question moot and the answer provided incorrect. SB | Revise "O" to "O ₂ ". | Incorrect answer, calculation, or solution |
| Chapter 12 Kinetics: Section 12.7 Catalysis | Figure 12.23 One of the arrows in figure b, says "Ethylene absorbed" where it should say "Ethylene adsorbed" (with a "d" instead of a "b"). I guess it is a typo, but it changes the meaning and can cause misunderstandings. | This figure will be updated. | Typo |
| Chapter 13 Fundamental Equilibrium Concepts: Key Equations | There are equations with delta-G listed in the key equations that aren't covered until later in the book, and do not appear in the PDF. | Delete the two equations beginning with "ΔG". | Typo |
| Chapter 13 Fundamental Equilibrium Concepts: Section 13.1 Chemical Equilibria | The chemical formula for dinitrogen tetroxide is represented by N-2O ₄ in two places. It should be N ₂ O ₄ . | Revise "N_2" to "N ₂ ". | Typo |

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| Chapter 13 Fundamental Equilibrium Concepts: Section 13.1 Chemical Equilibria | in the rate of f (kf) is written as N-2O4 and it should be N2O4 | Revise this to N2O4. | Typo |
| Chapter 13 Fundamental Equilibrium Concepts: Section 13.2 Equilibrium Constants | The expression for Q in terms of partial pressures lists the superscripts from the stoichiometry in the wrong place. The superscripts should be on each of the "P"s. Highlighted in the screenshot. | This expression will be updated. | Typo |
| Chapter 13 Fundamental Equilibrium Concepts: Section 13.2 Equilibrium Constants | In "example 13.3", and the subsection "Check your learning", in part (a), it says: ...mol of Cl ₂ (g), The 2 should be in the subscript, not written like it is. | Revise "Cl ₂ " to "Cl ₂ ". | Typo |
| Chapter 13 Fundamental Equilibrium Concepts: Section 13.2 Equilibrium Constants | Ch 13.2 -13.4 There are several superscripting and subscripting errors throughout the chapter. Marked in the attached pdf. | These superscripting and subscripting errors will be corrected. | Typo |
| Chapter 13 Fundamental Equilibrium Concepts: Section 13.2 Equilibrium Constants | Misplacement of symbols. The arrow and infinity sign are misplaced in the equation above Example 13.2; they should be at right of the equation as is correctly shown in the Chemistry 2e Atoms First text, PDF 702 PG 692 | Revise so that the arrow and infinity symbol are to the right of the equation. | General/pedagogical suggestion or question |
| Chapter 13 Fundamental Equilibrium Concepts: Section 13.2 Equilibrium Constants | Chapter 13 end-of-chapter problem 35 should have an equilibrium arrow rather than a "one way" arrow as it is an equilibrium question. | The chemical equation will be updated. | Typo |
| Chapter 13 Fundamental Equilibrium Concepts: Section 13.2 Equilibrium Constants | 13.48 links to the EOC answer section and has a listed answer of (a). The question is an essay questions, not a multiple choice. The correct answer to 13.49 is (a), so either the link should be moved to 13.49 and the answer label changed to 13.49, or the answer to 13.48 should be included:(Saturated solutions are an example of dynamic equilibrium. Dissociation and precipitation do not completely halt in a saturated solution; they just occur at the same rate, so individual Ag ⁺ ions (radioactive or not) can move back and forth between the solid and solution. | The answer for question 48 will be updated to "Though the solution is saturated, the dynamic nature of the solubility equilibrium means the opposing processes of solid dissolution and precipitation continue to occur (just at equal rates, meaning the dissolved ion concentrations and the amount of undissolved solid remain constant). The radioactive Ag ⁺ ions detected in the solution phase come from dissolution of the added solid, and their presence is countered by precipitation of nonradioactive Ag ⁺ ." | Incorrect answer, calculation, or solution |

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| Chapter 13 Fundamental Equilibrium Concepts: Section 13.2 Equilibrium Constants | Exercise 29 Answer. The question asks students to write the Q expression for the ionization of NH ₃ in water. The answer in the key is: $Q = \frac{[\text{NH}_4^+][\text{OH}^-]}{[\text{NH}_3]}$. The denominator is wrong and the expression should be: $Q = \frac{[\text{NH}_4^+][\text{OH}^-]}{[\text{NH}_3]}$ | Revise the denominator to [NH ₃]. | Typo |
| Chapter 13 Fundamental Equilibrium Concepts: Section 13.3 Shifting Equilibria: Le Châtelier's Principle | Should be: changing the volume of this gas-phase equilibrium mixture does not result (remove the trailing 's') in a shift of the equilibrium. | Revise "And so, changing the volume of this gas-phase equilibrium mixture does not results in a shift of the equilibrium" to "And so, changing the volume of this gas-phase equilibrium mixture does not result in a shift of the equilibrium." | Typo |
| Chapter 13 Fundamental Equilibrium Concepts: Section 13.3 Shifting Equilibria: Le Châtelier's Principle | Where is the following link supposed to go? It doesn't link to a PHET simulation. Link to Learning direct links to http://openstax.org/l/16chatelier But it redirects to Learnerstv.com PPU Library library.ppu.edu | This Link to Learning box will be deleted. | Broken link |
| Chapter 13 Fundamental Equilibrium Concepts: Section 13.3 Shifting Equilibria: Le Châtelier's Principle | Chemistry in Everyday life note about "Equilibrium and Soft drinks" "Priestly's approach involved production of carbon dioxidey..." Should read: "Priestly's approach involved production of carbon dioxide by" dioxidey --> dioxide by | Our reviewers accepted this change. | Typo |
| Chapter 13 Fundamental Equilibrium Concepts: Section 13.3 Shifting Equilibria: Le Châtelier's Principle | carbon dioxidey on page 737 | Replace "dioxidey" with "dioxide". | Typo |
| Chapter 13 Fundamental Equilibrium Concepts: Section 13.3 Shifting Equilibria: Le Châtelier's Principle | End of chapter Exercise 49 The prompt states that alpha- and beta-analine of the same concentration will have different freezing points, implying that these stereo-isomers have different dissociation constants. This is factually incorrect in the absence of other chiral compounds. (If this is correct, I would like to see the source data.) I suggest removing the question, or replacing the alanine with two different compounds that actually do have different freezing points at the same concentration. | This question will be replaced. | Other factual inaccuracy in content |
| Chapter 13 Fundamental Equilibrium Concepts: Section 13.4 Equilibrium Calculations | example 13.5 Check your learning letter C shows a reversible reaction of ammonia with water. The reaction is not balanced as it has 26 hydrogen atoms on the left side but only 12 hydrogen atoms on the right side. Also, there are 7 oxygen atoms on the left side, but a total of 14 oxygen atoms on the right side. | Revise "7H ₂ O" to "7O ₂ ". | Other factual inaccuracy in content |
| Chapter 13 Fundamental Equilibrium Concepts: Section 13.4 Equilibrium Calculations | The "check your learning" example problem associated with Example 13.13 is an equilibrium constant determination associated with the synthesis of nitrogen dioxide to dinitrogen tetroxide. A student and two instructors can't recreate the answer in the textbook of 6.9. Based on a delta-G of formation for NO ₂ of 99.8 kJ/mol and for N ₂ O ₄ of 51.3 | Revise the equation right before the answer to " $\text{N}_2\text{O}_4(\text{g}) \rightleftharpoons 2\text{NO}_2(\text{g})$ ". Revise the answer to "0.32". | Incorrect answer, calculation, or solution |

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| | kJ/mol, we determine a delta-G of reaction of -2.8 kJ/mol and an equilibrium constant K of 3.1. | | |
| Chapter 13 Fundamental Equilibrium Concepts: Section 13.4 Equilibrium Calculations | Example 13.9, check your learning. Acetic acid plus ethanol to give the ester and water. The answer you provide for the 4 components gives a Kc of 0.24 but the given Kc is 4.0. The error is that you reversed the correct equilibrium amounts: 0.17M concentrations are the two reactants and the 0.36M concentrations are the 2 products of the reaction as written. As given, the reaction proceeds from right to left to react equilibrium. I suggest you switch the initial concentrations so that the reaction proceeds in the direction written. | Revise "0.37" to "0.18" and "0.18" to "0.37". | Incorrect answer, calculation, or solution |
| Chapter 13 Fundamental Equilibrium Concepts: Section 13.4 Equilibrium Calculations | Example 13.9 and 13.8 the first Check Your Learning. The answer in the book and on-line are incorrect. If you plug the values into the equation for the equilibrium constant ($K = \frac{[\text{products}]}{[\text{reactants}]}$) they do not give the value of 4.0. The correct equilibrium concentrations of the reactants $\text{CH}_3\text{CO}_2\text{H}$ and $\text{C}_2\text{H}_5\text{OH}$ are 0.18 M, and of the products $\text{CH}_3\text{CO}_2\text{C}_2\text{H}_5$ and H_2O are 0.37 M. | Revise the Answer line below the Check Your Learning after Step 4 in this example to $[\text{CH}_3\text{CO}_2\text{H}] = 0.37 \text{ M}$, $[\text{C}_2\text{H}_5\text{OH}] = 0.37 \text{ M}$, $[\text{CH}_3\text{CO}_2\text{C}_2\text{H}_5] = 0.18 \text{ M}$, $[\text{H}_2\text{O}] = 0.18 \text{ M}$. | Incorrect answer, calculation, or solution |
| Chapter 13 Fundamental Equilibrium Concepts: Section 13.4 Equilibrium Calculations | Exercise 13.52 answer key The first part of the equation shows the concentration values with the exponents. The second part of the solution has squared and cubed the relevant reagents, but the square and cube superscripts are still there. These need to be removed. | This solution will be updated. | Typo |
| Chapter 13 Fundamental Equilibrium Concepts: Section 13.4 Equilibrium Calculations | Exercises #60, #61 It seems really flawed to omit the initial row of an ICE table on principle (they're not called CE tables), and especially so given that equilibrium concentrations are found by adding change to initial. Presumably the answers shown in the answer key were derived by assuming all initial concentrations/pressures were 0, but this leads to all answers having the impossible condition of negative concentration or negative pressure at equilibrium. That concentrations and partial pressures cannot be negative is an important concept since it is the only way to rule out the incorrect root(s) of a quadratic (polynomial) equation used to find the changes to reach equilibrium. | The ICE tables will be updated for questions 60 and 61. The answers will also be updated. | Other factual inaccuracy in content |
| Chapter 13 Fundamental Equilibrium Concepts: Section 13.4 Equilibrium Calculations | Exercises #60 and #61 It is unclear what the rows are below each reaction initial (I), change (C), or equilibrium (E). This should be added to clarify. | Revise the question stem to "Complete the partial ICE tables below." Each table for each part will be revised to show a column on the left with "change" and "equilibrium" at the beginning or rows 2 and 3. | General/pedagogical suggestion or question |
| Chapter 14 Acid-Base Equilibria: Introduction | On the first sentence of the paragraph, there is a typo on OH. It should be OH^- , not OH^a . | Revise to " OH^- ". | Typo |
| Chapter 14 Acid-Base Equilibria: Section 14.1 Brønsted-Lowry Acids and Bases | bolded word should be "amphiprotic" instead of "amphiprotric" | Our reviewers accepted this change, and it will be included in the next print cycle. | Typo |
| Chapter 14 Acid-Base Equilibria: Section 14.1 Brønsted-Lowry Acids and Bases | Example 14.7 Kb of F^- should be 1.6×10^{-11} instead of 1.4×10^{-11} , since $1 \times 10^{-14} / 6.4 \times 10^{-4} = 1.6 \times 10^{-11}$. The Ka of HF is 6.4×10^{-4} . | Revise " 1.4×10^{-11} " to " 1.6×10^{-11} ". | Incorrect answer, calculation, or solution |

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| Chapter 14 Acid-Base Equilibria: Section 14.1 Brønsted-Lowry Acids and Bases | In the first equation of example 14.1, Kw should be equal to x^2 instead of x . | Revise x to $(x)(x) = x^2$. | Incorrect answer, calculation, or solution |
| Chapter 14 Acid-Base Equilibria: Section 14.2 pH and pOH | pH and pOH End of Chapter Exercises Simple typo. 2.910×10^{-14} should be 2.910×10^{-14} . | Revise as indicated. | Typo |
| Chapter 14 Acid-Base Equilibria: Section 14.2 pH and pOH | In Exercise #19 Answer Calculate the pH and pOH of b) 0.21 M NaOH and d) 2.5 M KOH. Both questions have answers for which the pH and pOH are reversed. (These strong bases have pH's over 7, not under 7.) | For part b) and d), revise "pH" to "pOH" and vice versa. | Incorrect answer, calculation, or solution |
| Chapter 14 Acid-Base Equilibria: Section 14.3 Relative Strengths of Acids and Bases | "negligible can not be made." Should be "cannot" | Our reviewers accepted this change. | Typo |
| Chapter 14 Acid-Base Equilibria: Section 14.3 Relative Strengths of Acids and Bases | On the Kb constant appears [OH], it should be [OH ⁻]. | Revise to [OH ⁻]. | Typo |
| Chapter 14 Acid-Base Equilibria: Section 14.3 Relative Strengths of Acids and Bases | Exercise 60 a and b The first several lines of the solutions are correct, but at the final concentrations things fell apart. a) [H ₃ O ⁺] = [ClO ⁻] = 1.6×10^{-5} (missing charge on ion, wrong conc) [HClO] = 0.0092 M (an extra zero in current answers) b) wrong ion [C ₆ H ₅ NH ₃ ⁺] (not CH ₃ CO ₂ ⁻) and wrong conc [C ₆ H ₅ NH ₂] = 0.0784 M SB | The answer will be updated. | Incorrect answer, calculation, or solution |
| Chapter 14 Acid-Base Equilibria: Section 14.3 Relative Strengths of Acids and Bases | Exercise 58b, c, e Answers have the wrong powers of 10. b) Should be $K_a = 1.6 \times 10^{-10}$ c) Should be $K_b = 5.9 \times 10^{-8}$ (And ion should have been HAsO ₄ ²⁻) e) Should be $K_b = 2.3 \times 10^{-5}$ | In the question stem, revise part (c) to "HAsO ₄ ²⁻ (as a base)". Revise the answers to: b) $K_a = 1.6 \times 10^{-10}$ c) $K_b = 5.9 \times 10^{-8}$ e) $K_b = 2.3 \times 10^{-5}$ | Incorrect answer, calculation, or solution |
| Chapter 14 Acid-Base Equilibria: Section 14.3 Relative Strengths of Acids and Bases | Exercise 54c The answer in the back of the book is incorrect. It should be 6.4×10^{-5} and not 7.4×10^{-5} . SB | Revise the answer to " 6.4×10^{-5} ". | Incorrect answer, calculation, or solution |
| Chapter 14 Acid-Base Equilibria: Section 14.3 Relative Strengths of Acids and Bases | 14.33 This problem asks for a balanced equation and to identify the conjugate pairs. In the answers at the back of the book the CA and CB are misidentified. Perhaps it is just a spacing issue and you need to move the labels under the Cl ⁻ and H ₂ O. | The alignment will be updated. | Incorrect answer, calculation, or solution |
| Chapter 14 Acid-Base Equilibria: Section 14.3 Relative Strengths of Acids and Bases | Exercise # 28 I assume the intent of part b) and c) is to determine the weak acids and weak bases from the list in the problem prompt. As written this is not clear since in part a) the strong acids and bases are identified, it would seem to indicate from the set of strong acids and bases identify which are weak, which is not possible. Currently: | In the question stem, delete "CaO" and "CO ₂ ". In parts (b) and (c), revise "List those compounds in (a)..." to "Identify the compounds...". The solution will also be updated. | General/pedagogical suggestion or question |

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| | <p>(a) Identify the strong Brønsted-Lowry acids and strong Brønsted-Lowry bases.</p> <p>(b) List those compounds in (a) that can behave as Brønsted-Lowry acids with strengths lying between those of H₃O⁺ and H₂O.</p> <p>(c) List those compounds in (a) that can behave as Brønsted-Lowry bases with strengths lying between those of H₂O and OH⁻.</p> <p>Proposed correction:</p> <p>(a) Identify the strong Brønsted-Lowry acids and strong Brønsted-Lowry bases.</p> <p>(b) List the compounds, not already in (a), that can behave as Brønsted-Lowry acids with strengths lying between those of H₃O⁺ and H₂O.</p> <p>(c) List the compounds, not already in (a), that can behave as Brønsted-Lowry bases with strengths lying between those of H₂O and OH⁻.</p> | | |
| Chapter 14 Acid-Base Equilibria: Section 14.3 Relative Strengths of Acids and Bases | In Exercise 58c the original ion had the incorrect "3-" charge. It has been updated online incorrectly to "2" rather than to "2-" SB | Revise the superscript "2" to superscript "2-". | Typo |
| Chapter 14 Acid-Base Equilibria: Section 14.4 Hydrolysis of Salts | In Example 14.15 the formula of anilinium chloride in the first line of the problem either needs to have the positive charge within the brackets removed or the negative sign added after the Cl. The compound is not an ion as is currently shown. SB | Remove the superscripted "+". | Typo |
| Chapter 14 Acid-Base Equilibria: Section 14.4 Hydrolysis of Salts | After the 3rd equation in this section, "ammonia, NH ₃ ;" the 3 must be subscripted. SB | Set the "3" as subscript. | Typo |
| Chapter 14 Acid-Base Equilibria: Section 14.4 Hydrolysis of Salts | duplicate paragraphs for Salts with Acidic Ions | Our reviewers accepted this change. | Other |
| Chapter 14 Acid-Base Equilibria: Section 14.4 Hydrolysis of Salts | The equation is written without reaction arrow and the charge for the sodium is not written as a superscript. | Revise so the "+" charge after Na is set as a superscript. | Other |
| Chapter 14 Acid-Base Equilibria: Section 14.4 Hydrolysis of Salts | The first two paragraphs in the Salts with Acidic Ions subsection (the explanation of acid hydrolysis) are repeated successively. | The repeated content will be deleted. | Typo |
| Chapter 14 Acid-Base Equilibria: Section 14.5 Polyprotic Acids | last equation Bicarbonate ion is written as HCO ³⁻ , it should be HCO ₃ ⁻¹ | Revise "HCO ³⁻ " to "HCO ₃ ⁻ ". | Typo |
| Chapter 14 Acid-Base Equilibria: Section 14.5 Polyprotic Acids | Example 14.19 After calculating K _{a2} for H ₂ CO ₃ , the concentration of carbonate ion is 4.7x0 ⁻¹¹ , and the summary writes "5.6x10 ⁻¹¹ ". | Revise "5.6 × 10 ⁻¹¹ M" to "4.7 × 10 ⁻¹¹ M". | Incorrect answer, calculation, or solution |
| Chapter 14 Acid-Base Equilibria: Section 14.6 Buffers | Text says adding strong acid to the buffer will shift equilibrium to the right. Should be left. | The figure will be updated. Revise paragraph to ""For example, strong base added to this solution will neutralize hydronium ion, causing the acetic acid ionization | Other factual inaccuracy in content |

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| | | equilibrium to shift to the right and generate additional amounts of the weak conjugate base (acetate ion): [EQUATION] Likewise, strong acid added to this buffer solution will shift the above ionization equilibrium left, producing additional amounts of the weak conjugate acid (acetic acid)." | |
| Chapter 14 Acid-Base Equilibria: Section 14.6 Buffers | Example 14.20, part b "Adding strong <acid> will neutralize some of the acetic acid" should be "Adding strong <base> will neutralize some of the acetic acid" | Our reviewers accepted this change. | Typo |
| Chapter 14 Acid-Base Equilibria: Section 14.6 Buffers | Text says adding strong acid to the buffer will shift equilibrium to the right. Should be left. | The figure will be updated. Revise paragraph to "'For example, strong base added to this solution will neutralize hydronium ion, causing the acetic acid ionization equilibrium to shift to the right and generate additional amounts of the weak conjugate base (acetate ion): [EQUATION] Likewise, strong acid added to this buffer solution will shift the above ionization equilibrium left, producing additional amounts of the weak conjugate acid (acetic acid)." | Other factual inaccuracy in content |
| Chapter 14 Acid-Base Equilibria: Section 14.6 Buffers | The solution to part c of 14.90 makes no sense. There is a calculation for NH_4Cl which is not in the problem at all. The volume changes from 0.200 liters in the problem to 0.5. It is just a mess. Also, there is really no reason at his level not to use the Henderson Hasselbalch Equation to solve this problem. The whole point of this exercise is that adding acid doesn't really change the pH significantly. That gets lost in the mess. | This solution will be updated. | Incorrect answer, calculation, or solution |
| Chapter 14 Acid-Base Equilibria: Section 14.6 Buffers | Solution to Exercise 80 In the ICE table, the concentration of acetate at equilibrium is listed as 0.030-x it should be 0.030+x This doesn't change the results since we ignore x. But it would be confusing to students. | This solution will be updated. | Typo |
| Chapter 14 Acid-Base Equilibria: Section 14.6 Buffers | Figure 14.14 caption: The (un)buffered solution on the left and the ()buffered solution on the right | Revise "The buffered solution on the left and the unbuffered solution on the right..." to "The unbuffered solution on the left and the buffered solution on the right..." | Typo |
| Chapter 14 Acid-Base Equilibria: Section 14.6 Buffers | Example 14.20 Calculation (c), the equation between the hidronium and hydroxide is missing the arrows. | Add arrows after "(aq)". | Typo |

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| Chapter 14 Acid-Base Equilibria: Section 14.6 Buffers | Example 14.20 Calculation (c), says "hydrogen ion", it should say "hydronium" ion. | Revise "hydrogen ion" to "hydronium ion". | Typo |
| Chapter 14 Acid-Base Equilibria: Section 14.7 Acid-Base Titrations | In Acid-Base Indicators after explaining the use of the Henderson-Hasselbach equation for a methyl orange solution, when explaining that the log term of the equation should be negative if $\text{pH} < \text{pK}_a$ is wrongly written as $\text{pH} > \text{pK}_a$. This is written correctly in the first sentence where the log term is positive, thus, $\text{pH} > \text{pK}_a$. | Revise " $\text{pH} > \text{pK}_a$ " to " $\text{pH} < \text{pK}_a$ ". | Typo |
| Chapter 15 Equilibria of Other Reaction Classes: Section 15.1 Precipitation and Dissolution | In problem #13, the problem states that $\text{Ag}_4[\text{Fe}(\text{CN})_6]$ contains the $\text{Fe}(\text{CN})_4^-$ ion, which is incorrect. It should read that it contains the $\text{Fe}(\text{CN})_6^{4-}$ ion | Revise as indicated. | Other factual inaccuracy in content |
| Chapter 15 Equilibria of Other Reaction Classes: Section 15.1 Precipitation and Dissolution | Ch15, Q7 is a question about which of a series of salts would likely be affected by hydrolysis of the anion. The candidates include both PbS and ZnS , but only ZnS is indicated in the answer key as such a salt. I'm no inorganic chemist, but I can't see why the anions would differ in this case. I imagine that lead(II) might be able to form hydroxide complexes that zinc maybe doesn't, but as far as the sulfide goes, I think they would be treated similarly. My feeling is that the question writer intended to write either ZnS or PbS , but not both. More generally, I'm not sure where in the chapter this topic is discussed. | Delete ", PbS " from the end of question 7. | Incorrect answer, calculation, or solution |
| Chapter 15 Equilibria of Other Reaction Classes: Section 15.1 Precipitation and Dissolution | Exercise 1d Formatting error in that "x" is not under 3Mg^{2+} but is with the blank line under 2PO_4^{3-} . Additionally, the solutions use 3x as the "answer" and 2x as the given. | The alignment will be updated. Also update the answer to "x" and " $2/3x$ ". | Typo |
| Chapter 15 Equilibria of Other Reaction Classes: Section 15.1 Precipitation and Dissolution | Example 15.13, Check Your Learning Answer given is 1.10×10^{-10} M. This is actually the value for the concentration of OH^- at which $\text{Al}(\text{OH})_3$ begins to precipitate, but the question is asking for the molar solubility of $\text{Al}(\text{OH})_3$. The correct answer should be 3.67×10^{-11} M. | Revise the answer to " 4×10^{-11} M". | Incorrect answer, calculation, or solution |
| Chapter 15 Equilibria of Other Reaction Classes: Section 15.1 Precipitation and Dissolution | After the introduction Common Ion Effect it provides two "links to learning" that take you to the same page. | Delete the second Link to Learning box. | Other |
| Chapter 15 Equilibria of Other Reaction Classes: Section 15.1 Precipitation and Dissolution | Example 15.12 There are 7 total answers to this example, whereas there should be only 4. There is (a), (b), (c) and on the last one the last sentence is interrupted, then continues another (a), then another (b) and another (c). It finishes with one (d). | Delete the first (a), (b), and (c) and associated text in the solution. | Other |
| Chapter 15 Equilibria of Other Reaction Classes: Section 15.1 Precipitation and Dissolution | Example 15.11 After calculating the Q, it says "AgI", it should say AgBr . | Revise "AgI" to " AgBr ". | Typo |

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| Chapter 15 Equilibria of Other Reaction Classes: Section 15.1 Precipitation and Dissolution | In the calcium carbonate equilibrium reaction, the carbonate ion superscript isn't written as a superscript, just as an ordinary number. | Revise so that "2-" is set as a superscript. | Typo |
| Chapter 15 Equilibria of Other Reaction Classes: Section 15.1 Precipitation and Dissolution | Example 15.5. The answer of the solubility is written as 2.08×10^{-4} , whereas it should be 1.7×10^{-4} since the molarity of any of both ions is 1.3×10^{-2} . $(1.3 \times 10^{-2})(1.3 \times 10^{-2}) = 1.7 \times 10^{-4}$ | Revise the answer to " 1.69×10^{-4} ". | Incorrect answer, calculation, or solution |
| Chapter 15 Equilibria of Other Reaction Classes: Section 15.1 Precipitation and Dissolution | The error is in the worked out solution to Precipitation of Silver Halides towards the end of 15.1 (using the online text version). The concentration substituted for iodide ions should be 0.0010 M and not 0.10 M. | While the example itself is correct, there are a few typos that will be corrected. Revise Q to $Q_{sp} = K_{sp}$. | Typo |
| Chapter 15 Equilibria of Other Reaction Classes: Section 15.1 Precipitation and Dissolution | The solution to worked Example 15.10 contains two typographical errors, although the final solution is correct. First, the solubility product of $Mn(OH)_2$ is 2×10^{-13} , not 2×10^{-3} (correctly listed in Appendix J). Second, the last equation of this problem should be: $pH = 14.00 - 3.48 = 10.52$ (NOT $pH = 14.00 - 3.80 = 10.52$). Except for these two typos, the problem is done correctly. | Revise as indicated. | Typo |
| Chapter 15 Equilibria of Other Reaction Classes: Section 15.1 Precipitation and Dissolution | In worked Example 15.4, the calculation correctly solves for $x = 6.9 \times 10^{-3}$. But when reporting the molar solubility of calcium hydroxide, the answer is incorrect. The molar solubility is x , not $2x$. The correct answer for this problem is molar solubility = 6.9×10^{-3} Molar. The answer provided for the "Check Your Learning" problem is correct at 1.5×10^{-3} M. | Revise the solution as indicated. | Incorrect answer, calculation, or solution |
| Chapter 15 Equilibria of Other Reaction Classes: Section 15.1 Precipitation and Dissolution | question 29a $TlCl$: $K_{sp} = (1.21 \times 10^{-2})(1.2 \times 10^{-2}) = 1.45 \times 10^{-4}$; | Revise the answer to part (a) to " 1.45×10^{-4} ". | Incorrect answer, calculation, or solution |
| Chapter 15 Equilibria of Other Reaction Classes: Section 15.1 Precipitation and Dissolution | I may be misunderstanding, but Exercise 15.1.1 appears to be asking us to fill in blanks with the correct "x" value. However, this is very unclear. The lines are not aligned with the baseline of the "x" that is already given. Instead, it appears more of a strike-through. Moreover, based on the answer in the back of the book, part d should have two blanks or one filled in. Instead, it has just an empty area and then "x___", which makes no sense. I have attached a screenshot in which I filled in the correct answers based on the back of the book. The same thing also occurs in 15.1.2, though the "x___" issue is not there. | Move the "x" so that it appears under $3Mg^{2+}$. Keep the blank where it currently is. The answer will also be updated. | Other |
| Chapter 15 Equilibria of Other Reaction Classes: Section 15.1 Precipitation and Dissolution | End of Chapter question 59 (1) The listed K_{sp} values for the five salts are all different from the values listed in Appendix J (2) Based on the given values, the answer should be e, but the given answer key was c. | Revise " $MnCO_3$ " to " $MgCO_3$ ". | Incorrect answer, calculation, or solution |
| Chapter 15 Equilibria of Other Reaction Classes: | Chapter 15, Exercise 34 requires the use of K_{sp} for strontium fluoride, SrF_2 , but there is no value for the K_{sp} for strontium fluoride in Appendix J | Revise SrF_2 to $SrCrO_4$ and revise F_- to CrO_4^{2-} . The solution will be updated. | Other |

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| Section 15.1 Precipitation and Dissolution | | | |
| Chapter 15 Equilibria of Other Reaction Classes: Section 15.1 Precipitation and Dissolution | The answer to Chapter 15 #59 states "MnCO ₃ will form first, since it has the smallest K _{sp} value it is the least soluble. MnCO ₃ will be the last to precipitate, it has the largest K _{sp} value." Obviously MnCO ₃ cannot have simultaneously the largest and smallest value! BaCO ₃ will be the last to precipitate since it has the largest K _{sp} value. | Revise the question to: The carbonate ion concentration is gradually increased in a solution containing equal concentrations of the divalent cations of magnesium, calcium, strontium, barium, and manganese. Which of the following carbonates will precipitate first? Which will precipitate last? Explain. (a) MgCO ₃ •3H ₂ O K _{sp} = 1 × 10 ⁻⁵ (b) CaCO ₃ K _{sp} = 8.7 × 10 ⁻⁹ (c) SrCO ₃ K _{sp} = 7 × 10 ⁻¹⁰ (d) BaCO ₃ K _{sp} = 1.6 × 10 ⁻⁹ (e) MnCO ₃ K _{sp} = 8.8 × 10 ⁻¹¹ Revise the answer to "MnCO ₃ will form first since it has the smallest K _{sp} value among these homologous compounds and is therefore the least soluble. MnCO ₃ •3H ₂ O will be the last to precipitate since it has the largest K _{sp} value and is the most soluble." | Incorrect answer, calculation, or solution |
| Chapter 15 Equilibria of Other Reaction Classes: Section 15.2 Lewis Acids and Bases | Directly above example 15.14 "Dissociation of a Complex Ion" there appears to be text missing from the current online and pdf versions in this part of the book. On page 841, it has: "However, if NH ₃ is present in the water, the complex ion, Ag(NH ₃) ₂ ⁺ , can form according to the equation:" and example 15.14 immediately follows. At the same place in the book, this version: https://opentextbc.ca/chemistry/chapter/15-2-lewis-acids-and-bases/ includes the apparently missing chemical equation and discussion. | Our reviewers accepted this change, and it will be included in the next print cycle. | Other |
| Chapter 15 Equilibria of Other Reaction Classes: Section 15.2 Lewis Acids and Bases | The "check your learning" portion of Example 15.14 The answer is listed as 2.5e-22 M, however the correct answer should be 2.9e-22M. Assuming AgNO ₃ is the limiting reagent and the reaction goes to completion, you would need to consume a total of 0.012 M of KCN. Since you start with 0.154M of KCN, the leftover KCN should be 0.142M of KCN. Setting up the ICE table and going through the calculations yields a silver ion concentration of 2.9e-22M. The answer listed in the solution is 2.5e-22M. I believe that the book authors arrived at this solution by using 0.154M of KCN in the ice table instead of 0.142M of KCN (ie it did not subtract the amount of CN used to make Ag(CN) ₂ ⁻ . If you set up the | Revise "2.5" to "2.9" in the answer. | Incorrect answer, calculation, or solution |

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| | ICE table and use 0.154M of KCN, you would get exactly 2.5e-22M. | | |
| Chapter 15 Equilibria of Other Reaction Classes: Section 15.2 Lewis Acids and Bases | Answer to question 64 The concentration of 0.001 mol of $[Cd^{2+}]$ ions in the resulting 1.250 L solution should be 8×10^{-4} (not 8×10^{-5}). | Revise "1.150 L" to "0.150 L" in the question. Revise the answer to " 1.8×10^{-5} M". | Incorrect answer, calculation, or solution |
| Chapter 15 Equilibria of Other Reaction Classes: Section 15.3 Coupled Equilibria | <p>There are some serious problems with Example 15.16, and I think I will report it to them for improvement. This is a demonstration I used to do in class. You have AgBr, which is pretty insoluble and you add thiosulfate until it dissolves. As noted in the example, this reaction is necessary to fix a photographic film by removing the unexposed AgBr. In the first part, they calculate the Br⁻ concentration of the fully dissolved AgBr. That is fine and 0.0532 is the correct result.</p> <p>The second part is mathematically correct but would only be chemically correct if there were still some AgBr solid present. That means that there is still some film that has not been fixed at this point. The problem is unclear since it sounds like you are dissolving all the AgBr. The problem only works as they solve it, if there is still some undissolved AgBr present. As soon as the precipitate is completely dissolved, then the free Ag⁺ ion concentration is only controlled by the thiosulfate equilibrium. Since the Br⁻ concentration is based on the total amount of AgBr dissolving, this is inconsistent. I suppose they are assuming that there is still some AgBr in the film that has not dissolved.</p> <p>The next step is wierd becaue the math doesn't work. $0.00532 - 9.4 \times 10^{-11}$ is still 0.00532 I have no idea where the value 000521 comes from.</p> <p>If there is still AgBr undissolved on the film, then the free Ag⁺ must come from the AgBr solubility and will be the 9.4×10^{-11} that is calculated here.</p> <p>One can then put this into the formation constant equilibrium expression and determine the free thiosulfate that is not complexed with silver.</p> <p>Using the correct 0.00532 for the silver complex, the math gives $1.09 \times 10^{-3} = 1.1 \times 10^{-3}$ M thiosulfate uncomplexed. The problem in the text incorrectly has 1.15×10^{-3} instead because they use 0.00521 for the silver complex. Both end up with 1.1×10^{-3}.</p> <p>The final step for the problem is incomplete. The final solution that has dissolved the 1.0 g AgBr must contain 1.1×10^{-3} molar thiosulfate that is free, not complexed with silver. The formation constant equilibrium requires that to keep the AgBr dissolved. It takes 1.7 g of sodium thiosulfate to reach this concentration in the absence of AgBr. however, it takes another 0.00532×2 moles of thiosulfate to form the complex. So that requires 0.0106 moles of additional thiosulfate or 1.68 g. So the total thiosulfate required is twice the amount in the problem. It takes 1.7 g to form the complex and an excess of 1.7 g to reach the free thiosulfate concentration required.</p> | This example will be updated. | Incorrect answer, calculation, or solution |
| Chapter 15 Equilibria of Other Reaction Classes: | Example 15.16 The first error is a typo in the molarity of Silver ion (also the molarity of Silver Thiosulfide complex ion). The third step of the calculation shows the $Ag(S_2O_3)_2^{3-}$ concentration as 0.00532 M. The fourth step and fifth step | Replace two occurrences of "0.00521" with "0.00532". Replace " 1.15×10^{-6} " with " 1.18×10^{-6} ". Replace two | Incorrect answer, calculation, or solution |

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| Section 15.3 Coupled Equilibria | uses 0.00521 M with no explanation given for the change in molarity. The overall answer is also incorrect - 1.00L of 1.1×10^{-3} M Sodium Thiosulfate should have a mass of 0.17 grams. The answer says 1.7 grams which seems like 1.1×10^{-2} M solution was present. | occurrences of " 1.1×10^{-3} " with " 1.08×10^{-3} ". Replace two occurrences of "1.7" with "0.17". | |
| Chapter 15 Equilibria of Other Reaction Classes: Section 15.3 Coupled Equilibria | Exercise #91 At the end of the fourth line (solving for Kf), the denominator has the term $(0.025 + 6\Delta)$. This needs to be raised to the 6th power as it is shown earlier in the same line in the Kf expression. Unfortunately, when solved using the x-is-small approximation, there is no valid solution. So students would have to expand a 6th-order polynomial, and then carry out the remaining operations on all those terms in order to solve this properly. Keeping similar numbers, use 0.0100 mol of the complex ion salt. Use 0.25 M ammonia. the solution will be $[\text{Co}^{2+}] = 3.2 \times 10^{-4}$ | In the question, revise "0.100" to "0.010" and "0.025" to "0.25". The solution will also be updated. | Incorrect answer, calculation, or solution |
| Chapter 15 Equilibria of Other Reaction Classes: Section 15.3 Coupled Equilibria | Exercise #93 The answer key gives the hydroxide concentration here as 4.5×10^{-5} . I think it's 4.5×10^{-6} . Appendix J gives the $\text{Al}(\text{OH})_3$ Ksp as 2×10^{-32} . The molar solubility of the compound is reported as 2.2×10^{-20} , which doesn't appear to work for that Ksp with either 4.5×10^{-5} or 4.5×10^{-6} . I think it's 2.2×10^{-16} . | Revise " 10^{-5} " to " 10^{-6} " and " 10^{-20} " to " 10^{-16} ". | Incorrect answer, calculation, or solution |
| Chapter 15 Equilibria of Other Reaction Classes: Section 15.3 Coupled Equilibria | There are numerous typos in examples 15.15 and 15.16. In example 15.15, a solubility calculation is performed for aluminum hydroxide, but in the first line, this compound is written $\text{Ca}(\text{OH})_2$, and two lines later, is called calcium fluoride. In example 15.16, in line 6 of the solution, the bromide ion is written incorrectly with the negative charge as a subscript rather than a superscript. Also, that line gives a number of moles of 0.00532 mol, which is incorrectly written as 0.00521 mol on the following lines. Also, the thiosulfate ion in several places and silver thiosulfate in one place is written incorrectly, again confusing subscripts and superscripts. | These examples will be updated. | Typo |
| Chapter 15 Equilibria of Other Reaction Classes: Section 15.3 Coupled Equilibria | In example 15.15 there are a couple of typo: 1. Ca should be Al 2. molar solubility in water should be $1/4$ 3. $[\text{Al}^{2+}]$ should be $[\text{Al}^{3+}]$ | Revise "Ca" to "Al", " $1/3$ " to " $1/4$ ", " 9×10^{-12} M" to " 5×10^{-9} M", and " Al^{2+} " to " Al^{3+} ". | Typo |
| Chapter 15 Equilibria of Other Reaction Classes: Section 15.3 Coupled Equilibria | https://openstax.org/l/16coralreef redirect is broken. | This link will be updated. | Broken link |
| Chapter 15 Equilibria of Other Reaction Classes: Section 15.3 Coupled Equilibria | Exercise #99 In the problem Ksp for MnS should be listed as 2.3×10^{-13} as per Appendix J In the problem K should be listed as 8.9×10^{-27} if calculated from K_{a1} and K_{a2} for hydrogen sulfide, as given in Appendix H | Revise the Ksp = value to " 2.3×10^{-13} ". | Incorrect answer, calculation, or solution |
| Chapter 15 Equilibria of Other Reaction Classes: Section 15.3 Coupled Equilibria | Chapter 15 End of chapter question 105 typo HPO_4^- should be HPO_4^{2-} | Revise " HPO_4^- " to " HPO_4^{2-} ". | Typo |

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| Chapter 15 Equilibria of Other Reaction Classes: Section 15.3 Coupled Equilibria | Exercise #99 Ksp should be 4.3×10^{-22} and not 2.3×10^{-13} k should be 1×10^{-26} and not 8.9×10^{-27} , answer should be calculated based on the Ksp and k values above | The values will be updated in webview to match the current solution manual. | Typo |
| Chapter 16 Thermodynamics: Section 16.1 Spontaneity | "modificaton of work by" Should be "modification" | Our reviewers accepted this change. | Typo |
| Chapter 16 Thermodynamics: Section 16.1 Spontaneity | "0 in a vaccum)" Should be "vacuum" | Our reviewers accepted this change. | Typo |
| Chapter 16 Thermodynamics: Section 16.2 Entropy | In Check Your Learning, problem (d), the reactant is given as CaCO. It should be CaCO ₃ . | Revise "CaCO" to "CaCO_3" | Typo |
| Chapter 16 Thermodynamics: Section 16.2 Entropy | In Exercise #17a While it is generally true that precipitation is an example of a loss of entropy, care needs to be taken with aqueous ions, whose presence decreases the entropy of water, as is often the case with insoluble ionic solids. If you look at the standard entropy values in Appendix G, you can see that PbS(s) has more entropy (91.2 J/mol K) than the sum of Pb ²⁺ (aq) (10.5 J/mol K) + S ²⁻ (aq) (22 J/mol K). As I understand it this is not uncommon with insoluble ionic compounds | The equation in part (a) will be updated. | Other factual inaccuracy in content |
| Chapter 16 Thermodynamics: Section 16.3 The Second and Third Laws of Thermodynamics | In the part of Example 16.6 labelled "Check Your Learning" instead of the answer being $24.7 \text{ J K}^{-1} \text{ mol}^{-1}$ the answer should be 24.7 J/K (no moles) | Update the answer to " 24.7 J/K ". | Typo |
| Chapter 16 Thermodynamics: Section 16.3 The Second and Third Laws of Thermodynamics | Problem 16.28 asks the student to determine the change in entropy for several chemical reactions using appendix G. Problem 16.29 states the following: "Use the standard entropy data in Appendix G to determine the change in entropy for each of the reactions listed in Exercise 16.28. All the processes occur at the standard conditions and 25 °C." The first issue is that problem 16.29, as it is currently written, is asking the student to re-do exactly what they did in problem 16.28. The second issue is that if one compares their answers from problem 16.28 and the solution to problem 16.29 in the back of the book, they are different. They should not be since, as it currently stands, problems 16.28 and 16.29 are identical. The answers in the answer key for problem 16.29 are ACTUALLY the correct answers to the chemical reactions found in problem 16.34. If one goes through and calculates the standard entropy (not free energy as requested in 16.34) for all the chemical reactions in 16.34, they would get exactly the answers found as the solution for problem 16.29. | In the question stem, update the exercise link to "Exercise 16.34". | Incorrect answer, calculation, or solution |
| Chapter 16 Thermodynamics: Section 16.4 Free Energy | The answer for number 42 part b is incorrect. The correct answer should be 98.9 kJ/mol. The textbook says the answer is 61.5 kJ/mol, but this is wrong because - $(8.31425)(975)\ln(0.000005) = 98.9 \text{ kJ/mol}$. The person that solved this problem accidentally did $(0.00250)^2/0.0125$ for | Revise the answer to part (b) to "98.9 kJ/mol". The solution will also be updated. | Incorrect answer, calculation, or solution |

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| | K, instead of $(0.000250)^2/(0.0125)$. This mistake is also in the student solutions manual. The student solutions manual says the molarity for Cl is 0.000250 M, but then proceeds to use the number 0.002550 in the calculations, leading to an incorrect answer. | | |
| Chapter 16 Thermodynamics: Section 16.4 Free Energy | In the short paragraph between Example 16.13 and the Figure 16.14, it refers to a plot of the "free energy change" versus extent of reaction. Of course it is "free energy", not the change which is plotted here. | Delete the word "change" in the sentence "As may be shown by plotting the free energy change versus the extent...." | General/pedagogical suggestion or question |
| Chapter 16 Thermodynamics: Section 16.4 Free Energy | It is stated that " ΔG° is by definition zero for elemental substances under standard state conditions". The last 4 words are confusing, referring either to standard states or to standard conditions. A better phrase might be "in their standard states". | Revise "substances under standard state conditions" to "substances in their standard states". | General/pedagogical suggestion or question |
| Chapter 16 Thermodynamics: Section 16.4 Free Energy | Answer to check your learning problem 16.12. In the text the answer is listed as +45.1 KJ/mole. I get -123.5 KJ/mole at 1148 K (875 C) | Revise the answer to "-123.5 kJ/mol; yes". | Incorrect answer, calculation, or solution |
| Chapter 16 Thermodynamics: Section 16.4 Free Energy | I am pretty sure I have been doing these thermodynamic problems correctly but when I check the student solution manual it says that I am wrong. I don't think the solution manual that I have downloaded from your website includes the correct values being used. I am under the impression that question # 43 (as well as other previous questions) is asking for the student to use Appendix G in order to answer the problem using the constants found for delta H and delta S in order to find delta G to use in another formula. However, when you use those constants to do the problem, it seems that the solution manual is using a different constant that isn't anywhere in the appendix. Would it be possible to redo all these questions that use different constants that were probably from different sources and have them use the constants given in the textbook? It would greatly help me and other future students who are going to use this textbook in future semesters. | The solution for question 43 will be updated as follows: (a) $K = 1.07 \times 10^{-13}$; (b) $K = 2.42 \times 10^{-3}$; (c) $K = 2.73 \times 10^4$; (d) $K = 0.229$ (e) $K = 16.1$. | Incorrect answer, calculation, or solution |
| Chapter 16 Thermodynamics: Section 16.4 Free Energy | In the student solution guide for Chapter 12 (mod 4) #34c lists the free energy of S (g) as zero when it should actually be 238.25 kJ/mol. Therefore, the solution should be " $[1\text{mol}(-53.6 \text{ kJ/mol})] - [1\text{mol}(0 \text{ kJ/mol}) + 1\text{mol}(238.25 \text{ kJ/mol})] = -291.9 \text{ kJ}$ ". In the student solution guide Chapter 12 (mod 4) #33f, the incorrect standard free energy value is used for carbon tetrachloride. The value used is for the liquid, rather than for the gas, which is used in the original problem. Therefore, the solution should read " $[1\text{mol}(-58.2 \text{ kJ/mol}) + 1 \text{ mol}(-29.25 \text{ kJ/mol})] - [1\text{mol}(66.8 \text{ kJ/mol}) + 3\text{mol} (0 \text{ kJ/mol})] = -154.3 \text{ kJ}$ ". | Revise the solution to part (c) of exercise 34 from "-53.6 kJ" to "-291.9 kJ". | Incorrect answer, calculation, or solution |
| Chapter 16 Thermodynamics: Section 16.4 Free Energy | In the student solution guide for chapter 12 (mod 4) #56b, the value substituted for $[\text{Cl}_2]$ should be 0.0124 M, rather than 0.0125 M since 1% of the original quantity dissociates. This changes the value of K to 0.000504, thus making the value of delta G = 61,500 J/mol, or 61.5 kJ/mol. | Revise the solution for exercise 56 part b to "61.5 kJ/mol". | Incorrect answer, calculation, or solution |
| Chapter 16 Thermodynamics: Section 16.4 Free Energy | 16.4 Free Energy, Exercise 59 Should be "77.1 kJ/mole". The "J" is missing in "kJ". | In exercise 59, revise "k/mole" to "kJ/mole". | Typo |

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| Chapter 16 Thermodynamics: Section 16.4 Free Energy | There are three key equations listed at the end of 16.4. Of these, only the first one is addressed in this section. The second two equations relate ΔG to K and Q , neither of which is addressed or defined until chapter 13. There are example problems at the end of this section that deal with those two equations, and they would be better placed later in the book, after introducing Q and K . The examples in the text of 12.4, and most of the practice problems, are fine. | The last two equations will be moved to Chapter 13. | Other |
| Chapter 16 Thermodynamics: Section 16.4 Free Energy | In production of zinc from zinc sulfide example calculation in the "Free Energy Changes for Coupled Reactions" section, the ΔG value should be -98.8 kJ, not $+98.8$ kJ. | Revise " 98.8 kJ" to " -98.8 kJ". | Typo |
| Chapter 16 Thermodynamics: Section 16.4 Free Energy | It should be clarified that in the relationships between Gibbs free energy and equilibrium, these reaction quotients and equilibrium constants are for pressure, not concentration. This could be clarified by changing the equation from $\Delta G = \Delta G^\circ + RT \ln Q$ to $\Delta G = \Delta G^\circ + RT \ln Q_p$ and $\Delta G^\circ = -RT \ln K$ instead of $\Delta G^\circ = -RT \ln K_p$. | Add the following after the sentence ending "...and Q is the reaction quotient": "For gas phase equilibria, the pressure-based reaction quotient, Q_p , is used. The concentration-based reaction quotient, Q_c , is used for condensed phase equilibria." | General/pedagogical suggestion or question |
| Chapter 16 Thermodynamics: Section 16.4 Free Energy | In the solution to Example 16.8 (Calculation of ΔG zero of yellow mercury (II) oxide), in the part (a) of the solution, in the first equation, there is a letter "S" that does not belong. | Delete the S that appears in the first equation in the solution. | Typo |
| Chapter 16 Thermodynamics: Section 16.4 Free Energy | There has already been an erratum reported for this Check Your Learning (CYL) question. However, I believe the answer still needs to be updated. In the example right before this CYL question, Q used in the calculation is Q_p . In the previously reported erratum, Q used is Q_c . Given that change of gas molecule numbers is not zero, these two Q values will differ (just like K_p and K_c). I believe Q_p is the right one to use in the equation. The suggested solution is shown below for the CYL question: first to calculate partial pressure (in atm) for each chemical using $PV = nRT$, then use them to find Q_p , and eventually plug the Q_p to solve for ΔG . All chemicals have the same partial pressure: $P(\text{NH}_3) = P(\text{N}_2) = P(\text{H}_2) = (0.100 \times 0.08206 \times (875 + 273)) / 5 = 1.88$ atm. So $Q_p = (1.88^3 \times 1.88^1) / (1.88^2) = 1.88^2 = 3.55$. Therefore, $\Delta G = 33$ kJ/mol + $8.314 \times (875 + 273) \times \ln(3.55) / 1000$ kJ/mol = 45.1 kJ/mol. Also, note the unit for ΔG should be kJ/mol, instead of kJ. | Revise the answer to $\Delta G = +45.1$ kJ/mol; no. | Incorrect answer, calculation, or solution |
| Chapter 16 Thermodynamics: Section 16.4 Free Energy | Question 40 part c, there are no units on K_p . | Delete "atm" from the answer. | Other factual inaccuracy in content |
| Chapter 16 Thermodynamics: Section 16.4 Free Energy | Problem 43a I believe the answer given in the solutions ($K = 1.29$) is incorrect. Using values from the tables in the appendices I get $\Delta H = 49.4$ kJ, $\Delta S = -0.116$ kJ/K and ΔG at $373\text{K} = 92.7$ kJ. This gives $K = 1.05 \times 10^{-13}$. | Revise " $K = 1.29$ " to " $K = 1.07 \times 10^{-13}$ ". | Incorrect answer, calculation, or solution |
| Chapter 16 Thermodynamics: Section 16.4 Free Energy | Please fix the alignment issue in the web version (each part letter – a, b, c, etc., should begin a new line and come before the part's text)...this is an issue with *many* end of chapter exercises throughout the book | Our reviewers accepted this change, and it will be included in the next print cycle. | General/pedagogical suggestion or question |

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| Chapter 16 Thermodynamics: Section 16.4 Free Energy | Chapter 16 question 33 (f) the section on thermodynamics in the chemistry textbook has an answer of -30 kJ spontaneous when the answer is actually -154.25 kJ spontaneous. I have done the problem about 30 times to see if I could even get near -30 but if your appendix G values are correct there is no possibility of -30 kJ spontaneous being the correct answer. Hope someone can correct this as it was a homework problem for my chemistry class and it is incorrect. Thank you and all the best. | Revise the answer to "-154.3 kJ spontaneous". | Incorrect answer, calculation, or solution |
| Chapter 16 Thermodynamics: Section 16.4 Free Energy | The question asks for the boiling point of dichloroethane, but gives the formula for dichloromethane. The text should be corrected to 'dichloromethane.' TEXT: 46. Determine the normal boiling point (in kelvin) of dichloroethane, CH ₂ Cl ₂ . Find the actual boiling point using the Internet or some other source, and calculate the percent error in the temperature. Explain the differences, if any, between the two values. | Revise "dichloroethane" to "dichloromethane". | Typo |
| Chapter 17 Electrochemistry: Key Equations | the fifth bullet is only the right side of the equation. there should be an E(cell) = to the left of the text that is included. | Add "E_cell =" before the current equation. | Typo |
| Chapter 17 Electrochemistry: Section 17.1 Review of Redox Chemistry | There's a missing plus sign after the chromate ion. | Add "+" before "H+(aq)". | Typo |
| Chapter 17 Electrochemistry: Section 17.1 Review of Redox Chemistry | Example 17.1 Step 7: After the nitrogen monoxide gas, there is a plus sign missing before the 4 molecules of water. | Add "+" before "4H ₂ O(l)". | Typo |
| Chapter 17 Electrochemistry: Section 17.1 Review of Redox Chemistry | Ch17 Exercise 3 solution to part d. MnO ₄ ion is missing its charge (-1) | Revise "MnO ₄ " to "MnO ₄ ⁻ ". | Typo |
| Chapter 17 Electrochemistry: Section 17.2 Galvanic Cells | In the Solution, in the half-reactions, the cathode is mislabeled as "(oxidation)", whereas it should be "(reduction)". | Revise "cathode (oxidation)" to "cathode (reduction)". | Typo |
| Chapter 17 Electrochemistry: Section 17.2 Galvanic Cells | One of the Questions (#13 part c from the end of chapter questions) improperly has Au at the end, Au is not in the question. It should be Sn(s) (c) Mn(s)+Sn(NO ₃) ₂ (aq)→Mn(NO ₃) ₂ (aq)+Au(s) | Replace Au with Sn. | Typo |
| Chapter 17 Electrochemistry: Section 17.3 Electrode and Cell Potentials | Check your learning for example 15.4 In the answer: I ₂ (s) + 2Br ⁻ (aq) → 2I ⁻ (aq) + Br ₂ (l) is listed as spontaneous with an E _{cell} = +0.5518 V. But: I ₂ + 2e ⁻ → 2I ⁻ E = 0.5355 Cathode Br ₂ + 2e ⁻ → 2Br ⁻ E = 1.0873 Anode E _{cell} = E _{cathode} - E _{anode} = -0.4418 (non spontaneous, the reverse reaction is spontaneous) THE ANSWERS ARE FLIPPED (wrong sign, from what they should be) | This issue was addressed in another report and is correct in webview. | Incorrect answer, calculation, or solution |
| Chapter 17 Electrochemistry: Section 17.3 Electrode and Cell Potentials | Example 17.5 Check Your Learning The first equation (from top to bottom) should be non-spontaneous since the bromide ion experiments an oxidation to bromine (anode). Hence the negative sign. The second should be corrected too following the explanation. | Revise "+0.5518 V (spontaneous)" to "-0.5518 V (nonspontaneous)" and "-0.5518 V (nonspontaneous)" | Incorrect answer, calculation, or solution |

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| | | to "+0.5518 V (spontaneous)". | |
| Chapter 17 Electrochemistry: Section 17.3 Electrode and Cell Potentials | Question 17.25 labels both half cells as anodes. The solution assumes the aluminum is the cathode. The question should either state the reaction will be spontaneous/non-spontaneous. Or it should combine one each of a cathode and anode. | Revise "an anode" to "a cathode". | Typo |
| Chapter 17 Electrochemistry: Section 17.4 Potential, Free Energy, and Equilibrium | Text says 273.15K in listing standard conditions, but it should be 298K. | Revise "273.15 K" to "298 K". | Other factual inaccuracy in content |
| Chapter 17 Electrochemistry: Section 17.4 Potential, Free Energy, and Equilibrium | Somehow a minus sign has snuck in, in front of E_{cell}° on the right side of the equation. The equation should use $\log_{10} Q$ instead of $\ln Q$ to avoid confusion. I'd also like to add that the text doesn't specify that the 0.0592V "constant" is derived at the absolute temperature 298.15K (= 25 degrees C). This should be included in the edit to avoid erroneous use at other temperatures. | Revise the sentence before the equation to "A convenient form of the Nernst equation for most work is one in which values for the fundamental constants (R and F) and standard temperature (273.15 K), along with a factor converting from natural to base-10 logarithms, have been included:" The equation will be updated in errata 11706. | Other factual inaccuracy in content |
| Chapter 17 Electrochemistry: Section 17.4 Potential, Free Energy, and Equilibrium | The nernst equation listed right above example 17.7, end of section 17.4 is written as: $E_{\text{cell}} = E_{\text{ocell}} - (0.0592\text{V}/n)\ln(Q)$ it should be $E_{\text{cell}} = E_{\text{ocell}} - (0.0592\text{V}/n)\text{LOG}(Q)$ | Delete the negative sign before E°_{cell} and revise "ln" to "log". | Typo |
| Chapter 17 Electrochemistry: Section 17.4 Potential, Free Energy, and Equilibrium | Example 17.7 The final answer should be -0.13, not -0.014. $E = E^{\circ} - (RT/nF)\ln Q$ $E = ?$ $E^{\circ} = -0.167$ $RT/F = 0.0257$ $n = 2$ $Q = (0.15/1.94) = 0.0773$ $E = (-0.167) - (0.0257/2) \ln(0.0773)$ $E = (-0.167) - (0.02572/2)(-2.5601)$ $E = (-0.167) - (-0.03289)$ $E = \text{slightly greater than } -0.167$ $E = (-0.134)$ The reaction is non spontaneous because E is negative. | This is correct in webview. | Incorrect answer, calculation, or solution |
| Chapter 17 Electrochemistry: Section 17.4 Potential, Free Energy, and Equilibrium | Problem 31(c) Please see attached. | Revise the answer to part (c) to " 4.693×10^{21} ". | Incorrect answer, calculation, or solution |
| Chapter 17 Electrochemistry: Section 17.4 | in EOC problem #29(c) the words "bromine ion" are confusing. It says "aqueous bromide is oxidized to 0.11 M bromine ion" - bromine is not the ion in this case and it is | Revise the answer to part (c) to "The cell comprised of a half-cell in which aqueous | Typo |

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| Potential, Free Energy, and Equilibrium | confusing. Leaving out "ion" would be sufficient to correct this error. | bromine (1.0 M) is being oxidized to bromide ion (0.11 M) and a half-cell in which Al^{3+} (0.023 M) is being reduced to aluminum metal." | |
| Chapter 17 Electrochemistry: Section 17.4 Potential, Free Energy, and Equilibrium: The Nernst Equation | The last equation is written with an minus sign for the normal potential of the cell, this should be positive. | Revise "lnQ" to "logQ" in the equation right before Example 17.7. | Typo |
| Chapter 17 Electrochemistry: Section 17.5 Batteries and Fuel Cells | one of the errors that I found in the Chem 2 text that gave me fits last night was Example 17.5 on page 910. The Standard cell potential of Chromium is given as -0.774, and the actual value in the table is -0.744. The math as shown in the example is incorrect. Hope this helps! | Revise "-0.774" to "-0.744". | Incorrect answer, calculation, or solution |
| Chapter 17 Electrochemistry: Section 17.5 Batteries and Fuel Cells | Under the section that is discussing the lead acid battery, the set of reactions shown pertain to the lithium ion battery. The resolution is to replace those reactions with the lead/lead oxide reaction with sulfuric acid. I believe this is a "chemical typo." | This set of reactions will be updated. | Other factual inaccuracy in content |
| Chapter 17 Electrochemistry: Section 17.5 Batteries and Fuel Cells | In the section 16.5 on lithium ion batteries, while the figure is correct, the equations for the anode and cathode given are actually for the charging process rather than the discharging process. | This reaction will be updated. | Typo |
| Chapter 18 Representative Metals, Metalloids, and Nonmetals: Section 18.3 Structure and General Properties of the Metalloids | In Exercise 41 the students are referred to Appendix I instead of to Appendix G, which contains the thermodynamic values needed to solve the problem. | This link will be updated to direct to Appendix G. | Typo |
| Chapter 19 Transition Metals and Coordination Chemistry: Section 19.2 Coordination Chemistry of Transition Metals | Example 19.5, Figure 19.22 is describing cis and trans isomerism in coordination complexes. The trans- $[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$ should contain wedges and dashes - equivalent to how the cis isomer is shown in Figure 19.20. If the wedges and dashes are omitted, then the angles should be corrected to 90 degrees. (Wedges and dashes are preferable.) | This figure will be updated. | Typo |
| Chapter 19 Transition Metals and Coordination Chemistry: Section 19.2 Coordination Chemistry of Transition Metals | Table 19.5 $[\text{Ni}(\text{Cl})_4]^{2-}$ is TETRAHEDRAL, not square planar. Cl^- is a weak field ligand | Revise "NiCl_4" to "Ni(CN)_4". | Incorrect answer, calculation, or solution |
| Chapter 19 Transition Metals and Coordination Chemistry: Section 19.2 Coordination Chemistry of Transition Metals | On pg 1051 the text states that "Transition metals often form geometric isomers, in which...etc." The text should read "Coordination complexes" rather than "Transition metals". | Revise "Transition metals often form..." to "Transition metal complexes often exist as..." | Other factual inaccuracy in content |

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| Chapter 19 Transition Metals and Coordination Chemistry: Section 19.2 Coordination Chemistry of Transition Metals | In the table 19.1, the last entry reads that CO_2^{2-} is an anionic ligand with the name carbonato. The number of oxygens in the entry is incorrect. The carbonate ion (which is the carbonato ligand) is CO_3^{2-} | Revise CO_2 to CO_3 . | Typo |
| Chapter 19 Transition Metals and Coordination Chemistry: Section 19.3 Spectroscopic and Magnetic Properties of Coordination Compounds | In the example 19.9 the frequency is represented as the greek letter nu in line one on pg 1066. In the next line, the frequency is represented as "nu". | Revise "nu" to "v". | Typo |
| Chapter 19 Transition Metals and Coordination Chemistry: Section 19.3 Spectroscopic and Magnetic Properties of Coordination Compounds | When the example box for 19.8 continues from pg 1063 to pg 1064, the gray box for the example stops before the end of the example. The content from the top of the page until (and not including) the "Magnetic Moments of Molecules and Ions" should be part of the example. The figure for the example is missing the ligand locations, and missing the x and y axes labels for the d_{z^2} diagram. It appears the authors meant to show where the ligands would be located in this geometry but failed to do so. The text reads "This results in the octahedral t_{2g} and the e_g sets splitting and gives a more complicated pattern with no simple $(\Delta)_{\text{oct}}$." This text is ambiguous because it's unclear why the splitting energy would be called $(\Delta)_{\text{oct}}$ rather than $(\Delta)_{\text{sq}}$. Furthermore, the "pattern" referred to in this sentence is not the "pattern" referred to in the next sentence that refers to the d-orbital diagrams. | Revise the text before the image to "...more complicated pattern, as depicted below:". The image will also be updated. | Other |
| Chapter 19 Transition Metals and Coordination Chemistry: Section 19.3 Spectroscopic and Magnetic Properties of Coordination Compounds | In the second line of text, the symbol for the crystal field splitting energy is given. The 'oct' should be subscript. In the spectrochemical series, the caption reads '...in order of increasing field strength...'. It should read '...in order of increasing field strength...' | Revise to set "oct" as subscript. The typo in strength is correct in webview. | Typo |
| Chapter 20 Organic Chemistry: Section 20.1 Hydrocarbons | 11 g exercise. Incorrect answer key 4-methyl-1-pentene instead of 5-methyl-1-pentene | Revise "5-methyl-1-pentene" to "4-methyl-1-pentene". | Incorrect answer, calculation, or solution |
| Chapter 20 Organic Chemistry: Section 20.3 Aldehydes, Ketones, Carboxylic Acids, and Esters | The structures for butyl acetate and propyl isobutyrate are not correct (the chains are switched around to make methyl butyrate and isobutyl propionate, respectively). | This figure will be updated. | Other factual inaccuracy in content |
| Chapter 20 Organic Chemistry: Section 20.4 Amines and Amides | Problem 57 Geometry about the nitrogen in pyridine is bent, not trigonal planar. Or you could ask what the electron geometry is in the problem. | Revise the second sentence in the question stem to "What are the hybridizations, electron domain geometries, and molecular geometries about the nitrogen atoms in pyridine and in the | Incorrect answer, calculation, or solution |

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| | | pyridinium ion?" The figure in the answer will also be updated. | |
| Chapter 21 Nuclear Chemistry: Section 21.1 Nuclear Structure and Stability | The solution for part (b) of Example 21.1 compares the density of a neutron star to the density of a U-235 nucleus. The calculations appear correct, however, in summing up the answer by stating the comparison, your text says "These values are fairly similar (same order of magnitude), but the nucleus is more than twice as dense as the neutron star". According to your calculations, it should be the other way around, and it should state .."the neutron star is more than twice as dense than a U-235 nucleus." | Revise the last sentence before "Check Your Learning" to "These values are fairly similar (same order of magnitude), but the neutron star is more than twice as dense as the U-235 nucleus." | Incorrect answer, calculation, or solution |
| Chapter 21 Nuclear Chemistry: Section 21.2 Nuclear Equations | The incorrect table was uploaded to the website for Chapter 21.2. Tables 21.4 and 21.7 are identical on the web, though different in the hard copy and in their table description. https://openstax.org/books/chemistry-2e/pages/21-2-nuclear-equations Table 21.4 should show the names of the particles, their symbols, etc. This is what the hardcopy of the book and the Figure 21.4 text indicate. However, the table shown is that from section 21.3, Table 21.7 of nuclear equations. | Figure 21.4 will be updated. | Incorrect answer, calculation, or solution |
| Chapter 21 Nuclear Chemistry: Section 21.3 Radioactive Decay | At the part about the Dead Sea Scrolls, the calculations are correct, but the equation is not, due to the fact that it should be $\ln((N_0/N(t)))$ instead of $\ln(N(t)/N_0)$. In terms of answer, the right equation was taken into account, but it was written wrong. Please accept my humble opinion | While our reviewers determined there is no error with the equation or the computed result, a revision is needed to the related text narrative. Revise "-kt" to " $-\lambda t$ ". | General/pedagogical suggestion or question |
| Chapter 21 Nuclear Chemistry: Section 21.3 Radioactive Decay | In figure 21.7 none of the \rightarrow arrows are present in the print version. In the online version this has been partially corrected. Unfortunately, for Electron capture the arrow has been incorrectly placed. Electron capture should have the electron on the reactant side of the equation. As is, it is showing Beta decay. | This figure will be updated. | Typo |
| Chapter 21 Nuclear Chemistry: Section 21.3 Radioactive Decay | Figure 21.7 In the second column of the table all of the arrows are missing. In addition, in the bottom two rows the species "Y" is listed on the right hand side with mass number A and charge Y-1. The charge should be Z-1 rather than Y-1. | This figure will be updated. | Typo |
| Chapter 21 Nuclear Chemistry: Section 21.3 Radioactive Decay | Below the heading, Radiometric Dating: A reaction says C-14 decays to an electron and N-12, but it should be N-14. It is right above the picture of the cow and tree. | Revise as indicated. | Typo |
| Chapter 21 Nuclear Chemistry: Section 21.4 Transmutation and Nuclear Energy | On page 1151, I find this phrase: "Plutonium is now mostly formed in nuclear reactors as a byproduct during the decay of uranium. Some of the neutrons that are released during U-235 decay combine with U-238 nuclei to form uranium-239..." In fact, neutrons are released during fission of uranium, not during radioactive decay. I suggest replacing both instances of the word "decay" with "fission". | Revise the paragraph beginning "Plutonium is now mostly formed..." to "Plutonium is now mostly formed in nuclear reactors as a byproduct during the fission of U-235. Additional neutrons are released during this fission process (see the next section), some of which combine with U-238 nuclei to form uranium-239; this undergoes β decay to form neptunium-239, which in turn undergoes β decay to | Other factual inaccuracy in content |

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| | | form plutonium-239 as illustrated in the preceding three equations. These processes are summarized in the equation:." | |
| Chapter 21 Nuclear Chemistry: Section 21.4 Transmutation and Nuclear Energy | Below the heading "Nuclear Fusion and Fusion Reactors": It says deuteron and triton combine to form a helium nucleus and a neutron, but the equation mistakenly shows two neutrons. | Remove the "2" before the neutron in the reaction. | Typo |
| Chapter 21 Nuclear Chemistry: Section 21.4 Transmutation and Nuclear Energy | In the chemical equation shown on Figure 21.15 and Figure 21.16, the symbol for a neutron is incorrectly listed as $0\ 1\ n$ (mass number 0, charge 1) instead of $1\ 0\ n$ (mass number 1, charge 0). | These figures will be updated. | Typo |
| Chapter 21 Nuclear Chemistry: Section 21.6 Biological Effects of Radiation | In the Radon Exposure grey box it shows part of a decay series. U-238 to Radium-226, then Radium-222. It looks like it should be Radon-222 instead. | This figure will be updated. | Typo |
| Appendix A The Periodic Table | In November of 2016 the IUPAC symbols for elements 113, 115, 117, and 118 were adopted. "Elements 113, 115, 117, and 118 are now formally named nihonium (Nh), moscovium (Mc), tennessine (Ts), and oganesson (Og)" https://iupac.org/iupac-announces-the-names-of-the-elements-113-115-117-and-118/ It is suggested that the periodic table displayed incorporate the up-to-date symbols and names for those elements and that those that are metals be shaded as such according to the legend on the displayed periodic table. | This issue was addressed in another report and is correct in webview. | Other |
| Appendix B Essential Mathematics | At "EXAMPLE B4": It says "Divide 3.6×10^5 ", but it continues as if it said "... 10^{-5} " | Revise "5" to "-5". | Incorrect answer, calculation, or solution |
| Appendix G Standard Thermodynamic Properties for Selected Substances | A typo in example 12.7 of Chemistry: Atoms First 2e. The value for ΔH_f° (kJ/mol) of H ₂ O(l) is listed/calculated in the example as 286.83, but the given value in Appendix G and from my google search shows it as 285.83. There are more errors like this in examples throughout the book via service ticket 65354 | This example will be updated. | Typo |
| Appendix G Standard Thermodynamic Properties for Selected Substances | The phase is not listed. It should be HNO ₃ (aq). This value should be listed with the compounds of nitrogen after HNO ₃ (l) and HNO ₃ (g). Example 5.15 is the first example using standard enthalpy of formation and Appendix G. It is important to have these values listed clearly and with their phase. | A new row for HNO ₃ (aq) will be added to the table. | Typo |
| Appendix G Standard Thermodynamic Properties for Selected Substances | The Delta G of formation for liquid sulfuric acid, H ₂ SO ₄ (l), is listed as positive 690.00 kJ/mol, but it should be negative, as in -690.00 kJ/mol. | Revise "690.00" to "-690.00". | Typo |
| Appendix G Standard Thermodynamic Properties for Selected Substances | At the start of Appendix G, the units are incorrect for the change in enthalpy of formation. The units should be "kJ mol ⁻¹ " just like with the change in Gibbs free energy of formation. | Revise as indicated. | Typo |