

The Ultimate Resource: 14 Worksheets And Keys For College Prep And Honors Chemistry High School

As high school students delve into the world of chemistry, having access to comprehensive worksheets and answer keys can greatly enhance their learning experience. Whether you are preparing for college or taking an honors chemistry course, these resources are designed to help you excel in your studies and fully grasp the concepts of this fascinating scientific discipline.

1. Bonding Basics Worksheet

In this worksheet, you will explore the fundamentals of chemical bonding. Understanding how atoms combine to form compounds is essential to grasping the foundational principles of chemistry. This worksheet provides in-depth practice problems to reinforce your understanding.

Bonding Basics

ANSWER KEY

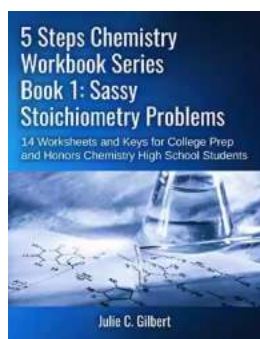
Section A: Complete the chart using a periodic table to help you.

Element	Atomic Symbol	Total # of Electrons	# of Valence Electrons	# of Electrons Needed to Gain or Lose (to Fill Outer Shell)	Oxidation Number
Chlorine	Cl	17	7	Gain 1	1-
Potassium	K	19	1	Lose 1	1+
Magnesium	Mg	12	2	Lose 2	2+
Fluorine	F	9	7	Gain 1	1-
Aluminum	Al	13	3	Lose 3	3+
Sodium	Na	11	1	Lose 1	1+
Nitrogen	N	14	4	Gain 3	3-
Oxygen	O	8	6	Gain 2	2-
Hydrogen	H	1	1	Gain or Lose 1	1+ or 1-
Carbon	C	6	4	Gain or Lose 4	4+ or 4-
Iodine	I	53	7	Gain 1	1-

Answer these questions:

- An atom that gains one or more electrons will have a **NEGATIVE** charge.
- An atom that loses one or more electrons will have a **POSITIVE** charge.
- An atom that gains or loses one or more electrons is called an **ION**.
- A positive ion is called a **CATION** and a negative ion is called an **ANION**.

T. Trimpe & L. Bogner 2008 <http://sciencespot.net/>



Sassy Stoichiometry Problems: 14 Worksheets and Keys for College Prep and Honors Chemistry High School Students (5 Steps Chemistry Workbook Series) by Julie C. Gilbert (Kindle Edition)

★★★★★ 5 out of 5

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File size : 2997 KB

Text-to-Speech : Enabled

Enhanced typesetting : Enabled
Word Wise : Enabled
Print length : 60 pages
Lending : Enabled
Screen Reader : Supported



2. Stoichiometry Worksheet

Stoichiometry deals with the quantitative relationships between reactants and products in chemical reactions. This worksheet introduces stoichiometry concepts and includes practice problems to fortify your skills in this crucial area of chemistry.

5 Steps Chemistry Workbook Series Book 2: Mighty Mole Concepts

14 Worksheets and Keys for College Prep
and Honors Chemistry High School Students



Julie C. Gilbert

3. Thermodynamics Worksheet

The study of energy transformations is vital in chemistry. This worksheet delves into thermodynamics, including energy transfer, enthalpy, and entropy. By completing the practice problems, you will solidify your comprehension of this pivotal topic.

AP Chemistry Chapter 17 Section 7 Electrolysis/Quantitative Electrochemistry

1. How many amps are required to deposit 5.00 grams of gold per hour on the cathode of an electrolytic cell containing a solution of a salt of gold in the +3 oxidation state?

$$5.00 \text{ g Au} \times \frac{1 \text{ mol Au}}{196.97 \text{ g}} \times \frac{3 \text{ mole}^-}{1 \text{ mol Au}} \times \frac{96500 \text{ C}}{1 \text{ mole}^-} \times \frac{1}{1 \text{ hour}} \times \frac{1 \text{ hour}}{3600 \text{ sec}} = \boxed{2.04 \text{ C/sec}} \\ \text{amps.}$$

2. How many coulombs per hour pass through an electroplating bath which has a current of 5.0 amperes?

$$1 \text{ hour} \times \frac{3600 \text{ sec}}{1 \text{ hour}} \times \frac{5.0 \text{ C}}{1 \text{ sec}} = \boxed{1.8 \times 10^4 \text{ C}}$$

3. A current of 1.6 amperes flows through a lamp when it is connected to a 112 volt source. What is the wattage of the bulb in the lamp?

$$\frac{1.6 \text{ C}}{1 \text{ sec}} \times \frac{112 \text{ J}}{1 \text{ C}} = 179.2 = \boxed{1.80 \times 10^2 \text{ J/sec}} \\ \text{watts.}$$

4. How long does it take to deposit 100.0 grams of $\text{Cr}_{(s)}$ from an electrolytic cell containing molten Cr_2O_3 at a current of 125 amps?

$$100.0 \text{ g Cr} \times \frac{1 \text{ mol Cr}}{52.00} \times \frac{3 \text{ mole}^-}{1 \text{ mol Cr}} \times \frac{96500 \text{ C}}{1 \text{ mole}^-} \times \frac{1 \text{ sec}}{125 \text{ C}} \times \frac{1 \text{ min}}{60 \text{ sec}} = \boxed{\begin{array}{l} 4454 \text{ sec} \\ 74.23 \text{ min} \\ 1.237 \text{ hours} \end{array}}$$

5. The common zinc-carbon cell uses $\text{Zn}_{(s)}$ as the reducing agent at the anode. What mass of $\text{Zn}_{(s)}$ will be consumed if 0.25 amps is drawn "from" the cell for a period of 2.0 hours?

$$2.0 \text{ hour} \times \frac{3600 \text{ sec}}{1 \text{ hour}} \times \frac{0.25 \text{ C}}{1 \text{ sec}} \times \frac{1 \text{ mole}^-}{96500 \text{ C}} \times \frac{1 \text{ mol Zn}}{2 \text{ mole}^-} \times \frac{65.39 \text{ g Zn}}{1 \text{ mol Zn}} = \boxed{0.61 \text{ g}}$$

4. Equilibrium Worksheet

Equilibrium is the state in which the forward and reverse reactions in a chemical system occur at equal rates. This worksheet provides insightful questions and scenarios to help you master the concept of chemical equilibrium.

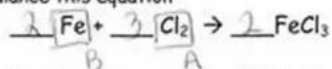
Chemistry

Name Mrs. Hatten

Stoichiometry Reflect #4

Learning Target... I can use stoichiometry to calculate amounts

1a. Balance this equation



1b. Determine how many moles of chlorine gas was used if the student weighed out 132 g of it.

$$132 \text{ g Cl}_2 \left(\frac{1 \text{ mol}}{70.90 \text{ g}} \right) = \boxed{1.86 \text{ moles Cl}_2}$$

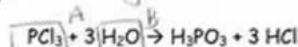
1c. Determine the amount of moles of iron also used in this reaction.

$$1.86 \text{ moles A} \left(\frac{2 \text{ mol B}}{3 \text{ mol A}} \right) = \boxed{1.24 \text{ moles Fe}}$$

1d. Determine how many grams of iron were used in this reaction.

$$1.24 \text{ mol Fe} \left(\frac{55.85 \text{ g}}{1 \text{ mol}} \right) = \boxed{69.3 \text{ g Fe}}$$

2. Using the following chemical reaction:

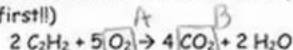


and, knowing that 86 g of phosphorus trichloride was used in this experiment, how many molecules of water was also used?

$$86 \text{ g PCl}_3 \left(\frac{1 \text{ mole A}}{137.32 \text{ g}} \right) \left(\frac{3 \text{ mol B}}{1 \text{ mol A}} \right) \left(\frac{6.02 \times 10^{23} \text{ mc}}{1 \text{ mol B}} \right) = \boxed{1.1 \times 10^{24} \text{ mc H}_2\text{O}}$$

3. Challenge...

What is the percent yield of the following reaction if 4.0 g of oxygen gas was used in the lab, and 4.6 g of carbon dioxide was measured at the end of the experiment? (hint: you must calculate the theoretical yield first!)



$$4.0 \text{ g O}_2 \left(\frac{1 \text{ mol A}}{32 \text{ g}} \right) \left(\frac{4 \text{ mol B}}{5 \text{ mol A}} \right) \left(\frac{44.01 \text{ g}}{1 \text{ mol}} \right) = 4.4 \text{ g CO}_2 \text{ theoretical}$$

$$\% \text{ yield} = \frac{4.6 \text{ g}}{4.4 \text{ g}} = \boxed{105\%}$$

Show work on back

5. Acids and Bases Worksheet

Acids and bases play a crucial role in various chemical reactions. This worksheet enables you to explore their properties, definitions, and reactions. By working through the provided exercises, you will gain a solid understanding of acids and bases.

SCIENCE 10: Chapter 5 Review Worksheet

Name: _____ Block: _____ Date: _____

1. Which of the following describes acids:

- I. Has a pH of less than 7
- II. Can conduct electricity
- III. Produce hydroxide ions when dissolved in water

- A. I and II only
- B. I and III only
- C. II and III only
- D. I, II and III



2. What is the chemical formula for sulphurous acid?:

- A. HS
- B. HSO₄
- C. H₂SO₃
- D. H₂SO₄

3. Which of the following is a base?:

- A. KCl
- B. HBr
- C. LiOH
- D. HNO₃

4. What happens to the number of H⁺ ions when HCl is added to water?:

- A. Increase
- B. Decrease
- C. Stays the same

5. What is the name for HClO₃?:

- A. Chloric acid
- B. Chlorous acid
- C. Perchloric acid
- D. Hydrochlorous acid

6. What is the pH of a substance that causes methyl orange to turn yellow and methyl red to turn red?

- A. 3
- B. 6.5
- C. 4.5
- D. 8

7. How many times more acidic is a substance with a pH of 2 than a substance with a pH of 5?

- A. 10
- B. 100
- C. 1000
- D. 30

8. Complete the following table:

Compound	Acid or Base?	Name
H ₃ PO ₄	Acid	Phosphoric acid
NH ₄ OH	Base	Ammonium hydroxide
H ₂ SO ₃	Acid	Sulfurous acid
HI	Acid	Hydroiodic acid
CH ₃ COOH	Acid	Acetic acid
Mg(OH) ₂	Base	Magnesium hydroxide
HBr	Acid	Hydrobromic acid
H ₂ CO ₃	Acid	Carbonic acid
NaOH	Base	Sodium hydroxide

6. Organic Chemistry Worksheet

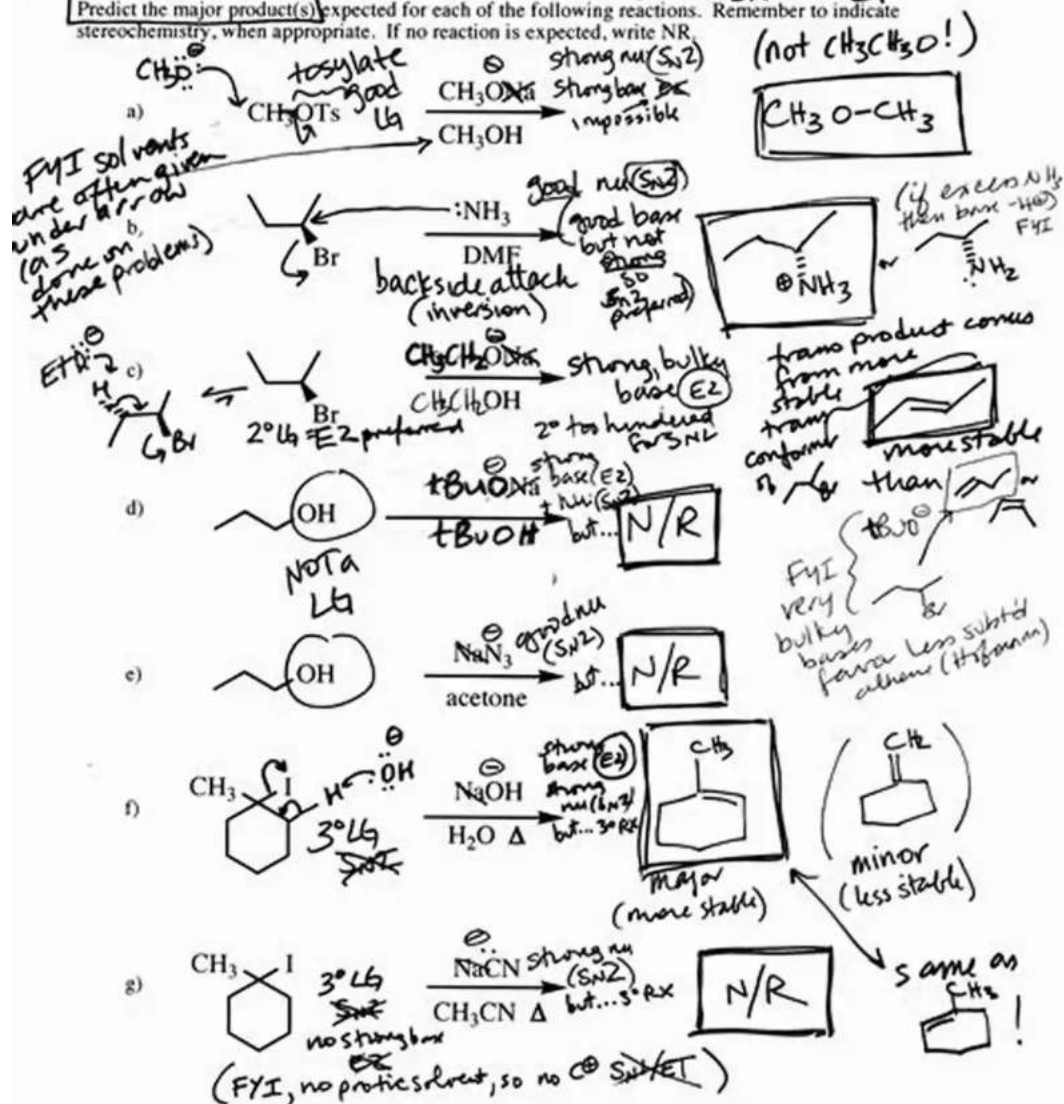
Organic chemistry focuses on the study of compounds containing carbon. This worksheet provides a comprehensive overview of organic chemistry, including nomenclature, functional groups, and reaction mechanisms. By completing the exercises, you will develop a strong foundation in this essential branch of chemistry.

S_N2 vs E2 Homework

Name: **ANSWER KEY**

none of these reaction conditions support carbocations so no S_N1 or E1

Predict the major product(s) expected for each of the following reactions. Remember to indicate stereochemistry, when appropriate. If no reaction is expected, write NR.

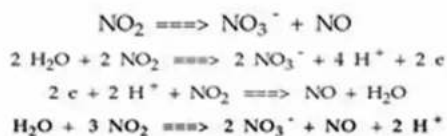
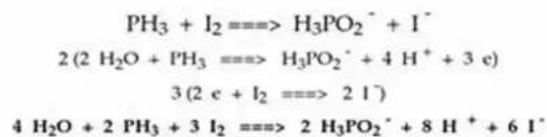
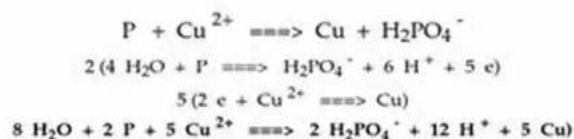
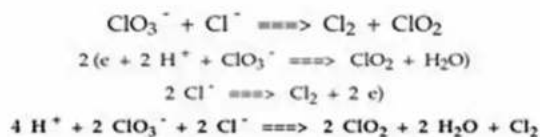
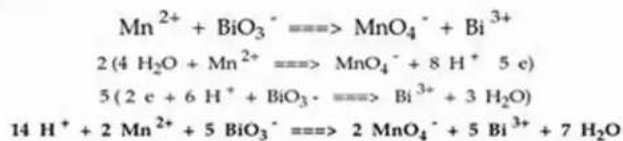


7. Redox Reactions Worksheet

Redox reactions involve the transfer of electrons between reactants. This worksheet explores the basics of redox reactions, including oxidation and reduction. By practicing with the provided problems, you will become proficient in balancing redox equations.

Balancing Redox Reactions Worksheet

Acid Solutions



8. Kinetics Worksheet

Kinetics focuses on the rate of chemical reactions and the factors that influence them. This worksheet introduces kinetics concepts and provides examples to enhance your understanding of reaction rates and reaction mechanisms.

Balancing Equations and Simple Stoichiometry-KEY

Balance the following equations:

- 1) $1 \text{ N}_2 + 3 \text{ F}_2 \rightarrow 2 \text{ NF}_3$
- 2) $2 \text{ C}_6\text{H}_{10} + 17 \text{ O}_2 \rightarrow 12 \text{ CO}_2 + 10 \text{ H}_2\text{O}$
- 3) $1 \text{ HBr} + 1 \text{ KHCO}_3 \rightarrow 1 \text{ H}_2\text{O} + 1 \text{ KBr} + 1 \text{ CO}_2$
- 4) $2 \text{ GaBr}_3 + 3 \text{ Na}_2\text{SO}_3 \rightarrow 1 \text{ Ga}_2(\text{SO}_3)_3 + 6 \text{ NaBr}$
- 5) $3 \text{ SnO} + 2 \text{ NF}_3 \rightarrow 3 \text{ SnF}_2 + 1 \text{ N}_2\text{O}_3$

Using the following equation:



- 6) How many grams of sodium sulfate will be formed if you start with 200 grams of sodium hydroxide and you have an excess of sulfuric acid?

- 7) Using the following equation:



How many grams of lithium nitrate will be needed to make 250 grams of lithium sulfate, assuming that you have an adequate amount of lead (IV) sulfate to do the reaction?

Using the following equation to answer questions 8-11:



- 8) If I do this reaction with 35 grams of C_6H_{10} and 45 grams of oxygen, how many grams of carbon dioxide will be formed?

When you do this calculation for 35 grams of C_6H_{10} , you find that 113 grams of CO_2 will be formed. When you do the calculation for 45 grams of oxygen, you find that 43.7 grams of CO_2 will be formed. Because 43.7 grams is the smaller number, oxygen is the limiting reagent, forming 43.7 grams of product.

9. Nuclear Chemistry Worksheet

Nuclear chemistry deals with the properties and behavior of atomic nuclei. This worksheet covers various aspects of nuclear chemistry, including radioactive decay, nuclear equations, and fission/fusion reactions. Completing the exercises will solidify your knowledge in this captivating field of study.

Name: _____
 Block: _____ Date: _____

Nuclear Chemistry Worksheet

Identify the following types of nuclear radiation

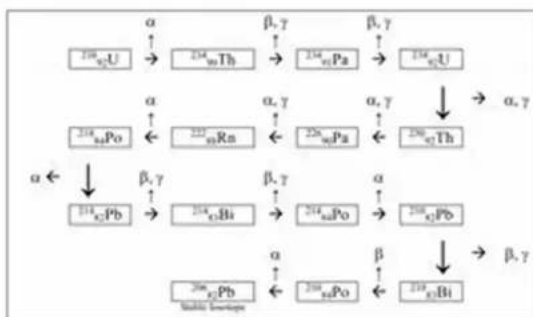
1. ${}_{-1}^0\text{e}$ _____
2. ${}_{2}^4\text{He}$ _____
3. ${}_{0}^0\gamma$ _____
4. Has no mass or charge, almost always follows α or β decay _____
5. Occurs when a neutron breaks apart and forms a proton _____
6. Least penetrating nuclear decay _____
7. Most damaging nuclear decay to the human body _____
8. Nuclear decay that can be stopped by skin or paper. _____
9. Nuclear decay that can be stopped by aluminum. _____
10. As a result, a proton is transformed into a neutron _____
11. The opposite of beta decay _____
12. Type of decay isotopes $>Z83$ will undergo _____

Complete the following nuclear equations.

13. ${}_{19}^{42}\text{K} \rightarrow {}_{-1}^0\text{e} + \underline{\hspace{2cm}}$
14. ${}_{4}^9\text{Be} \rightarrow {}_{4}^8\text{Be} + \underline{\hspace{2cm}}$
15. ${}_{3}^6\text{Li} \rightarrow {}_{2}^4\text{He} + \underline{\hspace{2cm}}$
16. ${}_{94}^{239}\text{Pu} \rightarrow {}_{2}^4\text{He} + \underline{\hspace{2cm}}$
17. ${}_{92}^{235}\text{U} \rightarrow \underline{\hspace{2cm}} + {}_{90}^{231}\text{Th}$
18. $\underline{\hspace{2cm}} \rightarrow {}_{56}^{142}\text{Ba} + {}_{36}^{91}\text{Kr} + 3 {}_{0}^1\text{n}$

Nuclear Decay Series

The figure maps the radioactive decay of uranium-238 to lead-206. Use the figure to answer the following questions.



19. How many alpha particles are produced as one atom of uranium-238 decays to an atom of lead-206?

20. How many beta particles? _____
21. Explain why lead-206 is a stable isotope. _____

10. Periodic Trends Worksheet

Understanding the periodic table and its trends is essential in chemistry. This worksheet explores periodic trends such as atomic radius, ionization energy, and electronegativity. By completing the practice problems, you will become proficient at interpreting and recognizing patterns within the periodic table.

1. Circle the element with the largest atomic radius and put a square around the element with the smallest atomic radius:

Cu K Ni Br

- a. Explain why you made these choices: All of the elements are in the same period. The trend in atomic radius as you go across a period is DECREASING. Therefore, the element on the far left (K) is the largest, and the element on the far right (Br) is the smallest.

2. Circle the element with the highest ionization energy and put a square around the element with the lowest ionization energy:

Cu K Ni Br

- a. Explain why you made these choices: All of the elements are in the same period. The trend in ionization energy as you go across a period is INCREASING. Therefore, the element on the far left (K) has the lowest ionization energy, and the element on the far right (Br) has the highest ionization energy.

3. Circle the element with the highest electronegativity and put a square around the element with the lowest electronegativity:

Cu K Ni Br

- a. Explain why you made these choices: All of the elements are in the same period. The trend in electronegativity as you go across a period is INCREASING. Therefore, the element on the far left (K) has the lowest electronegativity, and the element on the far right (Br) has the highest electronegativity.

4. For each of the following groups: Circle the element with the largest atomic radius and put a square around the element with the smallest atomic radius:

- 5.
- O C Be Ne Same Period
 - Na Rb Fr H Same Group
 - Pb C Sn Si Same Group
 - Au W S Fr Ne Zn Challenge

6. For each of the following groups: Circle the element with the highest ionization energy and put a square around the element with the lowest ionization energy:

- O C Be Ne Same Period
- Na Rb Fr H Same Group
- Pb C Sn Si Same Group
- Au W S Fr Ne Zn Challenge

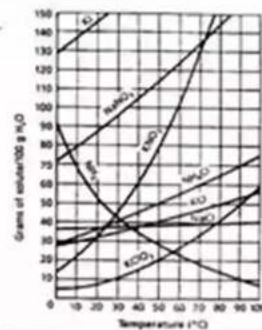
11. Solutions and Solubility Worksheet

Solutions are an integral part of chemistry. This worksheet focuses on the properties of solutions, solubility rules, and the calculation of molarity. By working through the provided problems, you will become adept at dealing with various solution scenarios.

Name _____
 Chemistry Period _____
 Date _____

SOLUTIONS WORKSHEET

A. Solubility curves – refer to the graph to answer the following questions.



1. What is the solubility of NH₄Cl at 70°C? **60 g**
2. Calculate the mass of NH₄Cl that would dissolve in 200 g of water at 90°C.
70 g @ 100g water → 140 g
3. At 0°C, 50.0 g NH₄Cl are added to 100 g water. To what temperature does the solution have to be raised in order to achieve a saturated solution of NH₄Cl_(aq)?

50°C

4. Is NH₃ a (s), (l), or (g)? Explain.

GAS – it's solubility decreases with increase in temperature. Opposite for solids

5. Determine how much water is required to dissolve 35.0 g NH₄Cl at 70°C in order to make a saturated solution. Show your work.

$$\frac{60}{100} = \frac{35}{x} \quad x = 58.3 \text{ g H}_2\text{O}$$

6. If a saturated solution of NH₃ at 15°C is warmed to 40°C, how much ammonia will "fall out" of the solution?

@ 15°C – 60 g soluble @ 40°C – 35 g soluble 25 g will fall out

B. MOLARITY

1. What is molarity a measure of? What is the formula for molarity? What are the units of molarity?

Concentration. M = n / V mol/L or M

2. Calculate the molarity of a 1.5 L solution that has 0.45 mol solute dissolved.

0.30 - M

3. Calculate the grams of sodium sulfate that are required to prepare 1.50 L of 0.25 M solution.

53.3 g Na₂SO₄

4. Calculate the volume of solution required to make 0.024 M solution using 15.0 g of calcium chloride.

V = 5.6 L

5. Describe in detail the steps you would take to prepare 1.50 L of 0.5 M solution of sodium chloride.

**n = 0.75 mol → 43.5 g NaCl 1) measure out 43.5 g NaCl
 2) put NaCl into graduated cylinder
 3) add enough water to make final volume 1.50 L**

12. Gases Worksheet

The study of gases is essential in understanding their behavior under different conditions. This worksheet covers gas laws, including Boyle's law, Charles's law, and the ideal gas law. By completing the exercises, you will develop a strong foundation in gas properties and calculations.

NAME: Key DATE: _____ PERIOD: _____

GAS STOICHIOMETRY PROBLEMS WORKSHEET 1

1. Given the unbalanced decomposition reaction of baking soda:
 $2\text{NaHCO}_3(s) + \text{heat} \implies \text{Na}_2\text{CO}_3(s) + \text{CO}_2(g) + \text{H}_2\text{O}(g)$
 42.0 grams of baking soda? What volumes of carbon dioxide and water are produced at STP?

$$42.0 \text{ g NaHCO}_3 \times \frac{1 \text{ mol NaHCO}_3}{84.0 \text{ g NaHCO}_3} \times \frac{1 \text{ mol CO}_2}{2 \text{ mol NaHCO}_3} \times \frac{22.4 \text{ L CO}_2}{1 \text{ mol CO}_2} = 5.6 \text{ L CO}_2$$

$$42.0 \text{ g NaHCO}_3 \times \frac{1 \text{ mol NaHCO}_3}{84.0 \text{ g NaHCO}_3} \times \frac{1 \text{ mol H}_2\text{O}}{2 \text{ mol NaHCO}_3} \times \frac{22.4 \text{ L H}_2\text{O}}{1 \text{ mol H}_2\text{O}} = 5.6 \text{ L H}_2\text{O}$$

2. The catalytic decomposition of hydrogen peroxide is:
 $2\text{H}_2\text{O}_2(l) \implies 2\text{H}_2\text{O}(l) + \text{O}_2(g)$
 Balance the reaction. How many moles of water and oxygen are produced by the decomposition of 68.0 grams of hydrogen peroxide? How many molecules of water and oxygen are produced? How many grams of each product are formed?

$$68 \text{ g H}_2\text{O}_2 \times \frac{1 \text{ mol H}_2\text{O}_2}{34.0 \text{ g H}_2\text{O}_2} \times \frac{2 \text{ mol H}_2\text{O}}{2 \text{ mol H}_2\text{O}_2} = 2.00 \text{ mol H}_2\text{O}$$

$$68 \text{ g H}_2\text{O}_2 \times \frac{1 \text{ mol H}_2\text{O}_2}{34.0 \text{ g H}_2\text{O}_2} \times \frac{1 \text{ mol O}_2}{2 \text{ mol H}_2\text{O}_2} = 1.00 \text{ mol O}_2$$

$$68 \text{ g H}_2\text{O}_2 \times \frac{1 \text{ mol H}_2\text{O}_2}{34.0 \text{ g H}_2\text{O}_2} \times \frac{2 \text{ mol H}_2\text{O}}{2 \text{ mol H}_2\text{O}_2} \times \frac{18.02 \text{ g H}_2\text{O}}{1 \text{ mol H}_2\text{O}} = 120 \text{ g H}_2\text{O}$$

$$68 \text{ g H}_2\text{O}_2 \times \frac{1 \text{ mol H}_2\text{O}_2}{34.0 \text{ g H}_2\text{O}_2} \times \frac{1 \text{ mol O}_2}{2 \text{ mol H}_2\text{O}_2} \times \frac{32.00 \text{ g O}_2}{1 \text{ mol O}_2} = 63.9 \text{ g O}_2$$

3. If 156.0 grams of potassium metal reacts with excess water:
 $2\text{K}(s) + 2\text{H}_2\text{O}(l) \implies 2\text{KOH}(aq) + \text{H}_2(g)$
 potassium hydroxide and hydrogen gas are formed? What volume of hydrogen gas, in liters, is produced? Be sure to balance the reaction first.

$$156 \text{ g K} \times \frac{1 \text{ mol K}}{39.09 \text{ g K}} \times \frac{1 \text{ mol H}_2}{2 \text{ mol K}} \times \frac{22.4 \text{ L H}_2}{1 \text{ mol H}_2} = 44.70 \text{ L H}_2$$

$$156 \text{ g K} \times \frac{1 \text{ mol K}}{39.09 \text{ g K}} \times \frac{2 \text{ mol KOH}}{2 \text{ mol K}} \times \frac{56.11 \text{ g KOH}}{1 \text{ mol KOH}} = 89.39 \text{ g KOH}$$

4. Determine the number of moles of carbon dioxide gas, water, and sodium chloride formed by the reaction of 42.0 grams of sodium bicarbonate (baking soda) reacting with excess hydrochloric acid. The reaction is:

$$\text{NaHCO}_3(s) + \text{HCl}(aq) \implies \text{CO}_2(g) + \text{H}_2\text{O}(l) + \text{NaCl}(aq)$$

$$42.0 \text{ g NaHCO}_3 \times \frac{1 \text{ mol NaHCO}_3}{84.0 \text{ g NaHCO}_3} \times \frac{1 \text{ mol CO}_2}{1 \text{ mol NaHCO}_3} = 0.5 \text{ mol CO}_2$$

$$42.0 \text{ g NaHCO}_3 \times \frac{1 \text{ mol NaHCO}_3}{84.0 \text{ g NaHCO}_3} \times \frac{1 \text{ mol H}_2\text{O}}{1 \text{ mol NaHCO}_3} = 0.5 \text{ mol H}_2\text{O}$$

$$42.0 \text{ g NaHCO}_3 \times \frac{1 \text{ mol NaHCO}_3}{84.0 \text{ g NaHCO}_3} \times \frac{1 \text{ mol NaCl}}{1 \text{ mol NaHCO}_3} = 0.5 \text{ mol NaCl}$$

13. Electrochemistry Worksheet

Electrochemistry deals with the relationship between electricity and chemical reactions. This worksheet explores topics such as cell potentials, electrolytic cells, and balancing redox reactions using the half-reaction method. By practicing with the provided problems, you will become proficient in electrochemistry.

1.) A piece of aluminum foil 1.00 cm square and 0.550 mm thick is allowed to react with bromine to form aluminum bromide.

a.) How many moles of aluminum were used? (density Al = 2.699 g/cm³)

$$.550 \text{ cm} \times \frac{10^{-3} \text{ m}}{1 \text{ cm}} = .00055 \text{ m}$$

$$1.00 \text{ cm} \times .00055 \text{ m} = .00055 \text{ cm}^2 \times \frac{2.699 \text{ g}}{\text{cm}^3} = .00148745 \text{ g Al} \times \frac{1 \text{ mol Al}}{26.98 \text{ g Al}} = 5.51 \times 10^{-5} \text{ mol Al}$$

b.) How many grams of aluminum bromide form, assuming the aluminum reacts completely? What type of reaction is this?



$$5.51 \times 10^{-5} \text{ mol Al} \times \frac{2 \text{ mol AlBr}_3}{2 \text{ mol Al}} \times \frac{266.7 \text{ g AlBr}_3}{1 \text{ mol AlBr}_3} = 1.47 \text{ g AlBr}_3$$

2.) The chemical formula for benzene is C₆H₆.

a. Determine the percent composition of H and C for benzene.

$$6(12.01) + 6(1.01) = 78.12$$

$$\text{C} = \frac{72.06}{78.12} \times 100 = 92.2\% \quad \text{H} = 100 - 92.2\% = 7.8\%$$

$$\left[\begin{array}{l} \text{C: } 92\% \\ \text{H: } 8\% \end{array} \right]$$

b. Write a balanced combustion reaction for benzene.



c. Assuming you have 364g of benzene, how many moles of O₂ will be required to completely combust this amount of benzene?

$$364 \text{ g} \times \frac{1 \text{ mol C}_6\text{H}_6}{78.12 \text{ g C}_6\text{H}_6} \times \frac{15 \text{ mol O}_2}{2 \text{ mol C}_6\text{H}_6} = 35.0 \text{ mol O}_2$$

d. How many grams of CO₂ will this produce? How many grams of H₂O?

$$\text{CO}_2: 364 \text{ g C}_6\text{H}_6 \times \frac{1 \text{ mol C}_6\text{H}_6}{78.12 \text{ g C}_6\text{H}_6} \times \frac{12 \text{ mol CO}_2}{2 \text{ mol C}_6\text{H}_6} \times \frac{44.01 \text{ g CO}_2}{1 \text{ mol CO}_2} = 1.23 \times 10^3 \text{ g CO}_2$$

$$\text{H}_2\text{O}: 364 \text{ g C}_6\text{H}_6 \times \frac{1 \text{ mol C}_6\text{H}_6}{78.12 \text{ g C}_6\text{H}_6} \times \frac{6 \text{ mol H}_2\text{O}}{2 \text{ mol C}_6\text{H}_6} \times \frac{18.02 \text{ g H}_2\text{O}}{1 \text{ mol H}_2\text{O}} = 2.52 \times 10^2 \text{ g H}_2\text{O}$$

e. You perform the combustion, and 956g of CO₂ are produced. What is the percent yield?

$$\frac{\text{Actual}}{\text{Theoretical}} \times 100 = \frac{956 \text{ g CO}_2}{1230 \text{ g CO}_2} \times 100 = 77.7\%$$

14. to Quantum Mechanics Worksheet

The field of quantum mechanics provides insights into the behavior of matter and energy at the atomic and subatomic levels. This worksheet introduces the basic principles of quantum mechanics, including wave-particle duality, electron configurations, and quantum numbers. Completing the exercises will enhance your understanding of this foundational concept.

Chemistry of Life Worksheet I

Complete the following Bohr Models and fill in the blanks:

Hydrogen

Symbol: _____

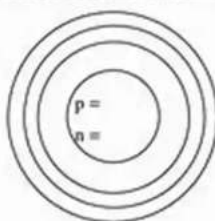
No. of Electrons: _____

Atomic Number: _____

Atomic Mass: _____

Oxidation Number: _____

Electron Configuration: _____



Carbon

Symbol: _____

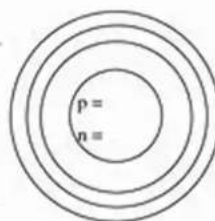
No. of Electrons: _____

Atomic Number: _____

Atomic Mass: _____

Oxidation Number: _____

Electron Configuration: _____



Phosphorous

Symbol: _____

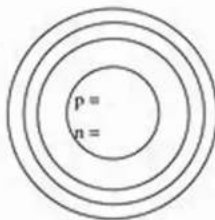
No. of Electrons: _____

Atomic Number: _____

Atomic Mass: _____

Oxidation Number: _____

Electron Configuration: _____



Chlorine

Symbol: _____

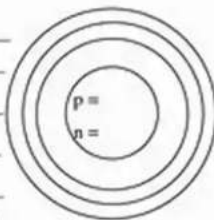
No. of Electrons: _____

Atomic Number: _____

Atomic Mass: _____

Oxidation Number: _____

Electron Configuration: _____



Oxygen

Symbol: _____

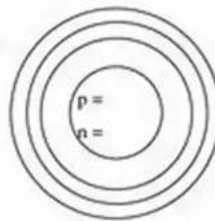
No. of Electrons: _____

Atomic Number: _____

Atomic Mass: _____

Oxidation Number: _____

Electron Configuration: _____



Sodium

Symbol: _____

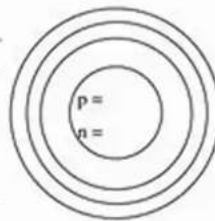
No. of Electrons: _____

Atomic Number: _____

Atomic Mass: _____

Oxidation Number: _____

Electron Configuration: _____



Potassium

Symbol: _____

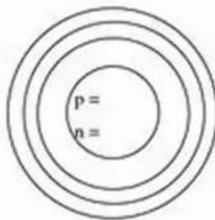
No. of Electrons: _____

Atomic Number: _____

Atomic Mass: _____

Oxidation Number: _____

Electron Configuration: _____



Nitrogen

Symbol: _____

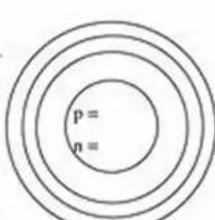
No. of Electrons: _____

Atomic Number: _____

Atomic Mass: _____

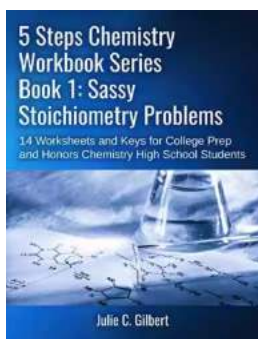
Oxidation Number: _____

Electron Configuration: _____



Chemistry of Life Worksheet Lab: 9/18/2007

By utilizing these worksheets and answer keys, you will have access to valuable resources that will undoubtedly contribute to your success in college prep and honors chemistry. Remember to practice regularly and seek clarification for any concepts you find challenging. Chemistry can be an exciting journey, and with the right tools, you are well on your way to mastering this fascinating subject!



Sassy Stoichiometry Problems: 14 Worksheets and Keys for College Prep and Honors Chemistry High School Students (5 Steps Chemistry

Workbook Series) by Julie C. Gilbert (Kindle Edition)

★★★★★ 5 out of 5

Language	: English
File size	: 2997 KB
Text-to-Speech	: Enabled
Enhanced typesetting	: Enabled
Word Wise	: Enabled
Print length	: 60 pages
Lending	: Enabled
Screen Reader	: Supported



Need more Stoichiometry practice?

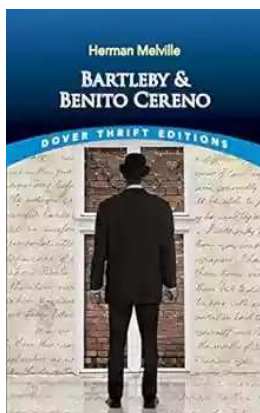
Stoichiometry has been striking fear into the hearts of chemistry students for ages. The best way to conquer something is to practice it.

Inside, you'll find ...

- Brief descriptions of each type of ideal stoichiometry and limiting reactant stoichiometry
- 4 ideal stoichiometry worksheets broken down by type with keys and explanations
- 4 ideal stoichiometry self-quizzes with their answer keys
- 2 limiting reactant stoichiometry worksheets with keys and explanations
- 2 limiting reactant stoichiometry self-quizzes with answer keys

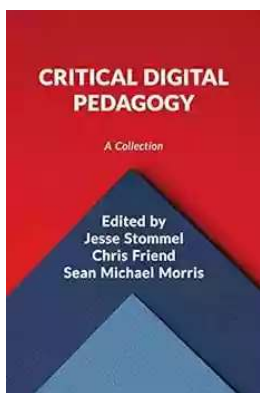
- 2 mixed stoichiometry self-tests with answer keys

This is a companion workbook for the 5 Steps to Surviving Chemistry book. However, you do not need to have read that book to find this workbook useful. Although I am making the ebook available, I strongly believe a physical copy is better for this kind of book. There is also a 5 Steps Chemistry Workbook Series Book 2: Mighty Mole Concepts.



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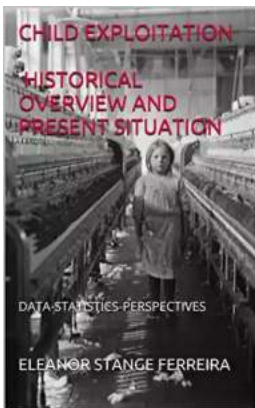
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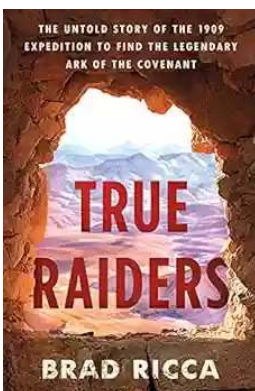
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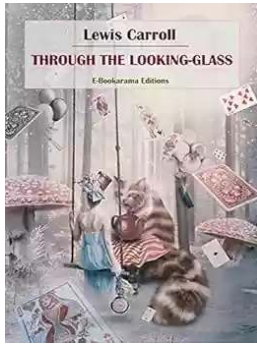
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