

# Mole Lab

## Introduction to The Mole Concept



### Introduction

Although technically not a laboratory experiment, this activity certainly helps to drive home the main idea behind the mole concept—that chemists can count out infinitesimally small particles by weighing.

### Concepts

- Avogadro's number
- Chemical formulas
- Molar mass or molecular weight

### Materials (for each lab station, two or three lab pairs can work at each station)

- Aluminum foil
- Ammonium sulfate,  $(\text{NH}_4)_2\text{SO}_4$ , 100 g
- Sodium chloride,  $\text{NaCl}$ , 500 g
- Water, distilled, 300 mL
- Balance, electronic, 0.01-g precision (if only triple beam balances are available, it is best if there is one for each lab pair)
- Beakers, 600-mL, or cut off 2-L soda bottles, 3 labeled
- Cups, blue, clear, and red plastic, 2–3 of each
- Pipets, Beral-type, 2–3
- Spoons, plastic, 4–6

### Materials (for the instructor's station, preferably near the center of the room)

- Copper sheet, 12 pieces\*
  - Balance, electronic, 0.01-g precision
  - Cups, blue, clear, and red plastic, 1 each
  - Scoring Standard Table
- \*See the Preparation section below for size of copper pieces.*

### Safety Precautions

*Ammonium sulfate is slightly toxic by ingestion. Wear chemical splash goggles, chemical-resistant gloves, and a chemical-resistant apron. Wash hands thoroughly with soap and water before leaving the laboratory. Follow all laboratory safety guidelines. Please review current Material Safety Data Sheets for additional safety, handling, and disposal information.*

### Preparation

1. Label three 600-mL beakers “NaCl,” “water,” and “ammonium sulfate” and add to each the corresponding substance. *Note:* Do not write the chemical formula for ammonium sulfate on the beaker; students must determine this.
2. Place 2–3 spoons in each beaker containing a solid substance.
3. Place 2–3 pipets in the beaker of water.
4. Cut twelve pieces of copper sheet according to Table 1 and label with the corresponding numbers 1–12. *Note:* The copper pieces can have any weights you want them to. Using the weights given in the table allows you to use the Scoring Standard table as is. If you use other weights, just modify column C in the table accordingly, as shown in Figure 1 on page 2.

Cu Piece	Mass (g)
#1	4.22
#2	4.78
#3	4.98
#4	5.13
#5	5.44
#6	5.97
#7	6.09
#8	6.55
#9	6.79
#10	7.13
#11	7.65
#12	7.98

# Mole Lab Student Guide

**Karen C. Timberlake**



## **Mole Lab Student Guide:**

The Organic Chem Lab Survival Manual James W. Zubrick,2016-01-19 Written for the laboratory that accompanies the sophomore junior level courses in Organic Chemistry Zubrick provides students with a valuable guide to the basic techniques of the Organic Chemistry lab The book will help students understand and practice good lab safety It will also help students become familiar with basic instrumentation techniques and apparatus and help them master the latest techniques such as interpretation of infrared spectroscopy The guide is mostly macroscale in its orientation *Study Guide for Chemical Principles* Thomas Elliott Taylor,1979

**Student Study Guide and Solutions Manual to accompany General Organic and Biological Chemistry, 1e** Kenneth W. Raymond,2005-10-07 Finally readers have a shorter less intimidating introduction to general organic and biological chemistry Not only is Raymond s text concise it also takes an integrated approach to presenting important topics in a way that makes the material easier to understand In this approach similarities can be exploited and concepts reinforced The result is that readers see the strong connections that exist between these three branches of chemistry

**General, Organic, and Biological Chemistry Study Guide and Selected Solutions** Karen C. Timberlake,2001-11 Keyed to the learning goals in the text this guide is designed to promote active learning through a variety of exercises with answers and mastery exams The guide also contains complete solutions to odd numbered problems

**Student Study Guide to accompany Foundations of College Chemistry, 11th Edition** Morris Hein,Susan Arena,2003-09-03 Work more effectively and gauge your progress along the way This Student Study Guide that accompanies Hein s Foundations of College Chemistry 11th Edition contains a review and self evaluation section challenge problems and answers and solutions for all exercises in the study guide Foundations of College Chemistry is the book that defined the prep intro chemistry market 35 years ago And it s been a market leader ever since Hein Arena is known for its accuracy clear no nonsense approach and direct writing style Strong problem solving and carefully constructed problem sets make this book a standout among its many imitators

**Chemistry, Student Study Guide** John A. Olmsted,Gregory M. Williams,2002-01-04 This third edition continues to innovate by providing students with an integrated and modern approach to the subject The text emphasizes the modern tools of chemistry while incorporating historical evidence and its unique molecular quantitative emphasis is further reinforced by an integrated media package developed by the authors Also of benefit is the just in time presentation of key content only providing details once they are needed While key topics and analytical techniques have been updated there is now an additional third chapter on chemical equilibrium The authors have also developed an expanded and more integrated problem solving emphasis that now incorporates a 4 step strategy throughout complete with text icons The whole is backed by a range of supplements including a new illustration program a tutorial CD interactive learningware an extensive Web CT component an instructor s resource CD and a solution CD *Study Guide [to Accompany] General Chemistry* James E. Brady,1982

**General Chemistry, Study Guide** James E. Brady,1990-03-01 The Fifth Edition retains

the pedagogical strengths that made the previous editions so popular and has been updated reorganized and streamlined Changes include more accessible introductory chapters with greater stress on the logic of the periodic table earlier introduction of redox reactions greater emphasis on the concept of energy a new section on Lewis structures earlier introduction of the ideal gas law and a new development of thermodynamics Each chapter ends with review questions and problems

**Resources in Education** ,1980 **Study Guide [to Accompany] General Chemistry** Dixie Goss,2002  
*Study Guide for Chemistry, Third Edition [by] Steven S. Zumdahl Paul B. Kelter,1993* **Survival Handbook for the New Chemistry Instructor** Diane M. Bunce,Cinzia M. Muzzi,2004 This book provides an overview of the issues facing new chemistry faculty in preparation for teaching Serving as a reference to answer specific questions new chemistry faculty encounter this book is comparable to sitting down with a colleague in the department and talking through some ideas or gaining some pointers on how to avoid common pitfalls It is the one single place new chemistry faculty can go to find practical information on how to teach and how to prepare for teaching their first course Chapters are written both by established experts in the field and by new professors within their first couple of years of teaching Study Guide for Hein and Arena's Foundations of College Chemistry Peter Scott,Rachael Enriquez Porter,1999-04-18 Study Guide to Accompany Introduction to Chemistry J.C. Cummins,Jack D. Cummins,1975 **Chemistry, Study Guide** James E. Brady,John R. Holum,1993-02-11 Offers accurate lucid and interesting explanations of basic concepts and facts of chemistry while helping students develop skills in analytical thinking and problem solving Students are taught in a variety of ways to think of skills as tools that can be used to solve complex problems Several aids are included to help focus and inspire student interest frequent reference to common chemicals in commercial products numerous photographs of reactions in chapter practice exercises following worked examples **An Introductory Guide to EC Competition Law and Practice** Valentine Korah,1994 **El-Hi Textbooks and Serials in Print** ,2006 *Holt Chemistry* Ralph Thomas Myers,2004 **Prentice Hall Chemistry** ,2000 Interns' Narrative and Paradigmatic Ways of Knowing Science Mark Robert Olson,2005

## Unveiling the Power of Verbal Beauty: An Psychological Sojourn through **Mole Lab Student Guide**

In a global inundated with displays and the cacophony of fast communication, the profound energy and mental resonance of verbal art frequently fade in to obscurity, eclipsed by the regular barrage of noise and distractions. However, nestled within the lyrical pages of **Mole Lab Student Guide**, a charming work of literary brilliance that impulses with natural emotions, lies an unique journey waiting to be embarked upon. Published with a virtuoso wordsmith, this magical opus courses readers on a psychological odyssey, lightly revealing the latent potential and profound influence stuck within the complex web of language. Within the heart-wrenching expanse of the evocative examination, we shall embark upon an introspective exploration of the book is main themes, dissect their interesting writing fashion, and immerse ourselves in the indelible impression it leaves upon the depths of readers souls.

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### **Table of Contents Mole Lab Student Guide**

1. Understanding the eBook Mole Lab Student Guide
  - The Rise of Digital Reading Mole Lab Student Guide
  - Advantages of eBooks Over Traditional Books
2. Identifying Mole Lab Student Guide
  - Exploring Different Genres
  - Considering Fiction vs. Non-Fiction
  - Determining Your Reading Goals
3. Choosing the Right eBook Platform
  - Popular eBook Platforms
  - Features to Look for in an Mole Lab Student Guide
  - User-Friendly Interface
4. Exploring eBook Recommendations from Mole Lab Student Guide
  - Personalized Recommendations

- Mole Lab Student Guide User Reviews and Ratings
- Mole Lab Student Guide and Bestseller Lists
- 5. Accessing Mole Lab Student Guide Free and Paid eBooks
  - Mole Lab Student Guide Public Domain eBooks
  - Mole Lab Student Guide eBook Subscription Services
  - Mole Lab Student Guide Budget-Friendly Options
- 6. Navigating Mole Lab Student Guide eBook Formats
  - ePub, PDF, MOBI, and More
  - Mole Lab Student Guide Compatibility with Devices
  - Mole Lab Student Guide Enhanced eBook Features
- 7. Enhancing Your Reading Experience
  - Adjustable Fonts and Text Sizes of Mole Lab Student Guide
  - Highlighting and Note-Taking Mole Lab Student Guide
  - Interactive Elements Mole Lab Student Guide
- 8. Staying Engaged with Mole Lab Student Guide
  - Joining Online Reading Communities
  - Participating in Virtual Book Clubs
  - Following Authors and Publishers Mole Lab Student Guide
- 9. Balancing eBooks and Physical Books Mole Lab Student Guide
  - Benefits of a Digital Library
  - Creating a Diverse Reading Collection Mole Lab Student Guide
- 10. Overcoming Reading Challenges
  - Dealing with Digital Eye Strain
  - Minimizing Distractions
  - Managing Screen Time
- 11. Cultivating a Reading Routine Mole Lab Student Guide
  - Setting Reading Goals Mole Lab Student Guide
  - Carving Out Dedicated Reading Time
- 12. Sourcing Reliable Information of Mole Lab Student Guide
  - Fact-Checking eBook Content of Mole Lab Student Guide

- Distinguishing Credible Sources
13. Promoting Lifelong Learning
- Utilizing eBooks for Skill Development
  - Exploring Educational eBooks
14. Embracing eBook Trends
- Integration of Multimedia Elements
  - Interactive and Gamified eBooks

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