



A titrimetric analysis requires the careful addition of titrant.

Experiment 9

A Volumetric Analysis

- To prepare and standardize a sodium hydroxide solution
- To determine the molar concentration of a strong acid

OBJECTIVES

The following techniques are used in the Experimental Procedure:

TECHNIQUES



A chemical analysis that is performed primarily with the aid of volumetric glassware (e.g., pipets, burets, volumetric flasks) is called a **volumetric analysis**. For a volumetric analysis procedure, a known quantity or a carefully measured amount of one substance reacts with a to-be-determined amount of another substance with the reaction occurring in aqueous solution. The volumes of all solutions are carefully measured with volumetric glassware.

The known amount of the substance for an analysis is generally measured and available in two ways:

1. As a **primary standard**—An accurate mass (and thus, moles) of a solid substance is measured on a balance, dissolved in water, and then reacted with the substance being analyzed.
2. As a **standard solution**—A measured number of moles of substance is present in a measured volume of solution, generally expressed as the molar concentration (or molarity) of the substance. A measured volume of the standard solution then reacts with the substance being analyzed.

The reaction of the known substance with the substance to be analyzed, occurring in aqueous solution, is generally conducted by a titration procedure.

The titration procedure requires a buret to dispense a liquid, called the **titrant**, into a flask containing the **analyte** (Figure 9.1a, page 134). For the acid–base titration studied in Part B of this experiment, the titrant is a standard solution of sodium hydroxide and the analyte is an acid.

INTRODUCTION

Primary standard: a substance that has a known high degree of purity, a relatively large molar mass, is nonhygroscopic, and reacts in a predictable way

Standard solution: a solution having a very well known concentration of a solute

Ja Beran Lab Manual Answers Valencia

J. A. Beran, Mark Lassiter



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Laboratory Manual for Principles of General Chemistry J. A. Beran, Mark Lassiter, 2022-08-16 Laboratory Manual for Principles of General Chemistry 11th Edition covers two semesters of a general chemistry laboratory program The material focuses on the lab experiences that reinforce the concepts that not all experimental conclusions are the same and depend on identifying an appropriate experimental procedure selecting the proper apparatus employing the proper techniques systematically analyzing and interpreting the data and minimizing inherent variables As a result of good data a scientific and analytical conclusion is made which may or may not be right but is certainly consistent with the data Experiments write textbooks textbooks don't write experiments A student's scientific literacy grows when experiences and observations associated with the scientific method are encountered Further experimentation provides additional cause effect observations leading to an even better understanding of the experiment The 11th edition's experiments are informative and challenging while offering a solid foundation for technique safety and experimental procedure The reporting and analysis of the data and the pre and post lab questions focus on the intuitiveness of the experiment The experiments may accompany any general chemistry textbook and are compiled at the beginning of each curricular unit An Additional Notes column is included in each experiment's Report Sheet to provide a space for recording observations and data during the experiment Continued emphasis on handling data is supported by the Data Analysis section **Workbook Lab Manual W/Answer Key**

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Table of Contents Ja Beran Lab Manual Answers Valencia

1. Understanding the eBook Ja Beran Lab Manual Answers Valencia
 - The Rise of Digital Reading Ja Beran Lab Manual Answers Valencia
 - Advantages of eBooks Over Traditional Books
2. Identifying Ja Beran Lab Manual Answers Valencia
 - 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 Ja Beran Lab Manual Answers Valencia
 - User-Friendly Interface
4. Exploring eBook Recommendations from Ja Beran Lab Manual Answers Valencia
 - Personalized Recommendations
 - Ja Beran Lab Manual Answers Valencia User Reviews and Ratings
 - Ja Beran Lab Manual Answers Valencia and Bestseller Lists
5. Accessing Ja Beran Lab Manual Answers Valencia Free and Paid eBooks
 - Ja Beran Lab Manual Answers Valencia Public Domain eBooks
 - Ja Beran Lab Manual Answers Valencia eBook Subscription Services
 - Ja Beran Lab Manual Answers Valencia Budget-Friendly Options
6. Navigating Ja Beran Lab Manual Answers Valencia eBook Formats
 - ePub, PDF, MOBI, and More
 - Ja Beran Lab Manual Answers Valencia Compatibility with Devices
 - Ja Beran Lab Manual Answers Valencia Enhanced eBook Features
7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Ja Beran Lab Manual Answers Valencia
 - Highlighting and Note-Taking Ja Beran Lab Manual Answers Valencia
 - Interactive Elements Ja Beran Lab Manual Answers Valencia

8. Staying Engaged with Ja Beran Lab Manual Answers Valencia
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Ja Beran Lab Manual Answers Valencia
9. Balancing eBooks and Physical Books Ja Beran Lab Manual Answers Valencia
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection Ja Beran Lab Manual Answers Valencia
10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
11. Cultivating a Reading Routine Ja Beran Lab Manual Answers Valencia
 - Setting Reading Goals Ja Beran Lab Manual Answers Valencia
 - Carving Out Dedicated Reading Time
12. Sourcing Reliable Information of Ja Beran Lab Manual Answers Valencia
 - Fact-Checking eBook Content of Ja Beran Lab Manual Answers Valencia
 - 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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