



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

Lab Manual Beran Hein

Jo A. Beran



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Laboratory Manual for Principles of General Chemistry J. A. Beran, 2013-12-12 A two term manual for General Chemistry This supplementary manual focuses on chemical principles and techniques The Laboratory Manual for Principles of General Chemistry tenth edition provides a broad scope of experiments coupled with a clear layout for ease of use The manual delivers material for two or three course terms It also assists chemistry students in knowing how to time various techniques in the lab environment The companion manual is organized into topic sections such as Chemical and Physical Properties Atomic and Molecular Structure Gases and Solutions

The Iron(III) Thiocyanate Reaction Kevin C. de Berg, 2019-11-13 This Brief presents an historical investigation into the reaction between ferric ions and thiocyanate ions which has been viewed in different ways throughout the last two centuries Historically the reaction was used in chemical analysis and to highlight the nature of chemical reactions the laws of chemistry models and theories of chemistry chemical nomenclature mathematics and data analysis and instrumentation which are important ingredients of what one might call the nature of chemistry Using the history of the iron III thiocyanate reaction as a basis the book s main objective is to explore how chemistry develops its own knowledge base how it assesses the reliability of that base and how some important tools of the trade have been brought to bear on a chemical reaction to achieve understanding a worthwhile goal of any historical investigation

Laboratory Manual for Principles of General Chemistry Jo Allan Beran, 2011-06-21 This new edition of the Beran lab manual emphasizes chemical principles as well as techniques The manual helps students understand the timing and situations for the various techniques The Beran lab manual has long been a market leading lab manual for general chemistry Each experiment is presented with concise objectives a comprehensive list of techniques and detailed lab intros and step by step procedures

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