

Experiment 9

Acid-Base Titration

OBJECTIVES:

- To learn basic chemical characteristics of acids and bases.
- To learn how to perform titrations with precision.
- To understand how titrations can be used in chemical analysis.
- To prepare and standardize an NaOH solution.
- To use your standardized NaOH to determine the molarity of acetic acid in vinegar.

INTRODUCTION:

All Freshman Chemistry labs include at least one **titration** experiment. Titration is an old and time-honored method of **quantitative analysis**.¹ In every titration, we have some reaction occurring between some pair of reactants, A & B.

General



Reaction

A titration reaction usually falls into one of the three following categories:

(1) A Precipitation Reaction.



(2) An Acid-Base Reaction.

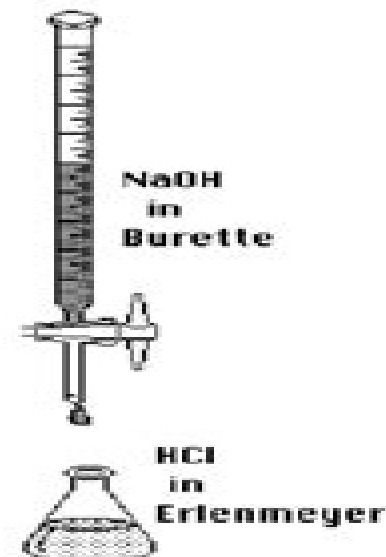


(3) An Oxidation-Reduction Reaction.



In today's experiment the reaction will be of type (2)—an acid-base neutralization reaction. As always in a titration, we place one reactant (a solution of NaOH) in a **Burette** and the other

¹ Quantitative Analysis techniques are designed to answer quantitative questions concerning how much of something is present in a sample. Quantitative Analysis techniques are to be distinguished from **Qualitative Analysis** techniques that are designed to answer qualitative questions concerning what substances are present in a sample.



Virtual Acid Base Ph Titration Packet Answers

Michael O'Brien



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Instructor's Manual Brian F. Woodfield, Matthew C. Asplunc, 2006 NEW Click here to visit the Virtual ChemLab Frequently Asked Questions FAQ document This Instructor's Lab Manual Workbook is similar to the Student Lab Manual Workbook and additionally contains an overview of the full capabilities of the Site License version of Virtual ChemLab installation instructions and the answers for the laboratory assignments provided in the student laboratory workbook This product is available within Virtual ChemLab General Chemistry Instructor Lab Manual Workbook and Student CD Combo Package v2 5 0 13 228010 8 Valuepack and or should be ordered in conjunction with Virtual ChemLab General Chemistry Instructor Site License CD v2 5 0 13 185749 5

Ph Scale And Acid-base Titrations/standardization Postma Roberts Hollenberg, James M. Postma, Julian Roberts, J. Leland Hollenberg, 2000-01-15 PH, Buffers and Acid-base Titrations LaMotte Chemical Products Co. Educational Products Division, 197? Aqueous Acid-base Equilibria and Titrations Robert De Levie, 1999 This book will give students a thorough grounding in pH and associated equilibria material absolutely fundamental to the understanding of many aspects of chemistry It is in addition a fresh and modern approach to a topic all too often taught in an outmoded way This book uses new theoretical developments which have led to more generalized approaches to equilibrium problems these approaches are often simpler than the approximations which they replace Acid base problems are readily addressed in terms of the proton condition a convenient amalgam of the mass and charge constraints of the chemical system considered The graphical approach of Bjerrum Hagg and Sillen is used to illustrate the orders of magnitude of the concentrations of the various species involved in chemical equilibria Based on these concentrations the proton condition can usually be simplified often leading directly to the value of the pH In the description of acid base titrations a general master equation is developed It provides a continuous and complete description of the entire titration curve which can then be used for computer based comparison with experimental data Graphical estimates of the steepness of titration curves are also developed from which the practicality of a given titration can be anticipated Activity effects are described in detail including their effect on titration curves The discussion emphasizes the distinction between equilibrium constants and electrometric pH measurements which are subject to activity corrections and balance equations and spectroscopic pH measurements which are not Finally an entire chapter is devoted to what the pH meter measures and to the experimental and theoretical uncertainties involved

PH Measurement and Titration G. Mattock, 1961

Advanced Ph Measurement and Control Gregory K. McMillan, Robert A. Cameron, 2004-10-30

An On-line Acid-base Titration Applet in the Generic Tutorial System for the Sciences Project Thomas Lee Gummo, 2002 The purpose of this Master's Project was to develop an Acid Base Titration Simulator It was also to be a part of the California State University San Bernardino's GTSS Generic Tutorial System for the Sciences project The main benefit is that students will be able to conduct titration experiments over the Internet without being in the laboratory and without costly equipment or dangerous

chemicals Instructors at the high school and college level can demonstrate the key principles of titration **ACID-BASE EQUILIBRIA** NARAYAN CHANGDER,2024-05-16 Note Anyone can request the PDF version of this practice set workbook by emailing me at cbsenet4u gmail com You can also get full PDF books in quiz format on our youtube channel <https://www.youtube.com/smartquiziz> I will send you a PDF version of this workbook This book has been designed for candidates preparing for various competitive examinations It contains many objective questions specifically designed for different exams Answer keys are provided at the end of each page It will undoubtedly serve as the best preparation material for aspirants This book is an engaging quiz eBook for all and offers something for everyone This book will satisfy the curiosity of most students while also challenging their trivia skills and introducing them to new information Use this invaluable book to test your subject matter expertise Multiple choice exams are a common assessment method that all prospective candidates must be familiar with in today's academic environment Although the majority of students are accustomed to this MCQ format many are not well versed in it To achieve success in MCQ tests quizzes and trivia challenges one requires test taking techniques and skills in addition to subject knowledge It also provides you with the skills and information you need to achieve a good score in challenging tests or competitive examinations Whether you have studied the subject on your own read for pleasure or completed coursework it will assess your knowledge and prepare you for competitive exams quizzes trivia and more

Acid Base Titrations Shah Purvesh,2015-08-04 In Acid Base Titrations the author discussed various acid base titration It gives some basic concept of acid base titration The analysis of acid base titration discussed in this book It also covers Titration of polyprotic acid and mixture of acids Titration of a Polybasic base with a Strong Acid pH transition range for an indicator titration of salts Differential Alkali titration are discussed in simplest type General Theory of Acid-base Titration

Pat Richard Pondy,1949 **Acid-Base Titration** Bird,1995-01-01 **Acid/Base Titrations** Michael O'Brien,1999 **A Computer Model for Acid-base Titration Equivalence Point Determination** John Michael Parr,1976 **General Expressions for Acid-Base Titrations of Arbitrary Mixtures** ,1995 A single general master equation is given for acid base titrations describing the entire progress of the titration and equally valid for the titration of a strong acid with a strong base as for that of the titration of an arbitrary mixture of acids with an arbitrary mixture of bases or vice versa

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