

DETERMINATION OF PHOSPHORIC ACID CONTENT IN SOFT DRINKS

LAB PH 8

From Chemistry with Calculators, Vernier Software & Technology, 2000

INTRODUCTION

Phosphoric acid is one of several weak acids that present in carbonated beverages. It is a component of all cola soft drinks. Phosphoric acid has a much higher concentration than other acids present in a soft drink, so its concentration can be determined by a simple acid-base titration.

In this experiment, you will titrate a sample of a cola soft drink with a sodium hydroxide solution and determine the concentration of phosphoric acid, H_3PO_4 . Hydrogen ions from the first dissociation of phosphoric acid react with hydroxide ions from the NaOH in a one-to-one ratio in the overall reaction:



In this experiment, you will use a pH Sensor to monitor pH as you titrate. The region of most rapid pH change will then be used to determine the equivalence point. The volume of NaOH titrant required to reach the equivalence point will be used to determine the molarity of the H_3PO_4 .

PURPOSE

The purpose of this experiment is to determine the amount of phosphoric acid, H_3PO_4 , in a variety of soft drinks by titrating each sample with sodium hydroxide, NaOH.

MATERIALS

LabPro interface
TI Graphing Calculator
DataMate program
pH Sensor
various cola soft drinks, decarbonated
0.050 M NaOH
deionized water

50-mL buret
100-mL graduated cylinder
250-mL beaker
ring stand
utility clamp
magnetic stirrer (if available)
stirring bar (or stirring rod)

SAFETY

- Always wear goggles and an apron in the lab.
- Do not eat or drink in the lab.
- Sodium hydroxide is caustic. Avoid spilling the solution on your skin or clothing.

Determination Of The Phosphoric Acid Content In Soft Drinks

**Muhamed Brka, Enisa Omanović-
Miklićanin, Lutvija Karić, Vedad
Falan, Almir Toroman**

Determination Of The Phosphoric Acid Content In Soft Drinks:

Phosphates in Food Ricardo A. Molins, 2018-05-04 Phosphates in Food provides the first comprehensive analysis of phosphates used in food processing in almost 20 years The book describes the nomenclature structure chemistry and analytical procedures for phosphates in foods Interactions between added and some natural phosphates and food components particularly proteins carbohydrates lipids and metal ions are examined in relation to using phosphates in food processing for such purposes as increasing the water holding capacity of proteins improving emulsification preventing gelation and delaying lipid oxidation The book also discusses the use of phosphates in specific food groups such as milk and dairy products meats poultry and fish fruits and vegetables bakery products and cereals and miscellaneous food products including beverages fats and oils sugar and confectionery products eggs and derivatives and specialty products An extensive section discussing the importance of phosphates as microbial agents is presented and is followed by a final section that examines the nutritional and health implications of elevated phosphate intake The book contains 1 135 references 43 tables and 34 figures making it an ideal reference resource for researchers in food sciences microbiology and nutrition food and chemical industries and regulatory agencies within local state and federal governments *30th Scientific-Experts*

Conference of Agriculture and Food Industry Muhamed Brka, Enisa Omanović-Miklićanin, Lutvija Karić, Vedad Falan, Almir Toroman, 2020-02-03 This book gathers the proceedings of the 30th Scientific Experts Conference of Agriculture and Food Industry held on September 26 27 2019 in Sarajevo Bosnia and Herzegovina It reports on the application of innovative technologies in food sciences and agriculture and covers research in plant and animal production agricultural economics and food production Further the book discusses key social and environmental issues and proposes answers to current challenges The conference was jointly organized by the Faculty of Agriculture and Food Sciences of the University of Sarajevo Bosnia and Herzegovina the Faculty of Agriculture of Ege University Turkey the Bosnia and Herzegovina Medical and Biological Engineering Society and the Faculty of Agriculture of the University of Belgrade Serbia The proceedings offer a timely snapshot of cutting edge multidisciplinary research and developments in modern agriculture As such they address the needs of researchers and professionals agricultural companies food producers and regulatory and food safety agencies

Chemistry and Technology of Soft Drinks and Fruit Juices Philip R. Ashurst, 2008-04-15 Soft drinks and fruit juices are produced in almost every country in the world and their availability is remarkable From the largest cities to some of the remotest villages soft drinks are available in a variety of flavours and packaging The market for these products continues to show a remarkable potential for growth The variety of products and packaging types continues to expand and among the more significant developments in recent years has been the increase in diet drinks of very high quality many of which are based on spring or natural mineral water This book provides an overview of the chemistry and technology of soft drinks and fruit juices The original edition has been completely revised and extended with new chapters on Trends in Beverage Markets

Fruit and Juice Processing Carbohydrate and Intense Sweeteners Non Carbonated Beverages Carbonated Beverages and Functional Drinks containing Herbal Extracts It is directed at graduates in food science chemistry or microbiology entering production quality control new product development or marketing in the beverage industry or in companies supplying ingredients or packaging materials to the beverage industry *Proceedings of the Annual Convention* Association of Official Agricultural Chemists (U.S.),1910 Bulletin - Bureau of Chemistry United States. Bureau of Chemistry,1911 Journal of the Association of Official Agricultural Chemists Association of Official Agricultural Chemists (U.S.),1921 Includes the Proceedings of the 30th 1913 annual convention of the association *Bulletin* United States. Bureau of Chemistry,1913 LabWorks Joseph R. Crook,1997 *Food Industries* ,1949 **Manufacture and Analysis of Carbonated Beverages** Morris Boris Jacobs,1959 CONTENTS INTRODUCTION 2 SUGARS AND SYRUPS 3 ARTIFICIAL AND HIGH POWER SWEETENING AGENTS 4 ACIDS AND ACIDULATION 5 WATER AND WATER TREATMENT 6 FLAVORS AND FLAVORING 7 SPECIALTY AND FRUIT FLAVORS 8 EMULSIONS AND SPECIALTIES 9 COLORS AND COLORING 10 CARBON DIOXIDE AND CARBONATION 11 BOTTLING AND CANNING 12 COMPOSITION OF CARBONATED BEVERAGES 13 PLANT LAYOUT AND SANITATION 14 SPOILAGE 15 CHEMICAL ANALYSIS INDEX PREFACE In this book I have endeavored to present a comprehensive treatment of the manufacture and analysis of carbonated nonalcoholic beverages or carbonated soft drinks as they are commonly called Each category of the raw materials used in these beverages is considered namely sugars and sirups artificial sweetening agents acids water flavors and flavoring including specialty and fruit flavors and also flavor emulsions both of the clear and cloudy type colors and coloring and carbon dioxide The actual manufacturing steps are described in detail in the chapter on bottling and canning and in this connection bottle washing caustic solution preparation plant layout plant housekeeping and sanitation are discussed in detail The composition of the finished beverages by categories is considered The various types of spoilage that may occur and the means for the prevention of such spoilage are treated in another chapter Finally the methods of analysis both for control during manufacture and for the determination of composition are detailed I acknowledge with thanks the cooperation given to me by the American Bottlers of Carbonated Beverages and by several firms These acknowledgements are given specifically in the text It may be noted that reference is made to American Bottlers of Carbonated Beverages the United States Pharmacopeia and the National Formulary standards and specifications for a number of raw materials These agencies speak for themselves and their standards are quoted merely as guides for desirable practice Some beverage flavor and color formulations are listed in this book Some of the compositions mentioned are illustrative of commercial practice while others are of an experimental nature These formulas have been included to serve as suggestions to the manufacturer they are not given as a formulary The application of knowledge of the art and skill may result in the improvement of these formulations The mention of a particular substance in this book does not in any manner imply that I approve of the use of such a substance The Bottler & Packer ,1947 Non-intoxicants Carl

Alfred Nowak,1922 **The Chemical Analysis of Foods** Henry Edward Cox,David Pearson,1962 CONTENTS 1 REQUIREMENTS FOR FOOD OF THE UNITED STATES FOOD DRUG AND COSMETIC ACT 2 GENERAL METHODS Moisture Ash Nitrogen and Crude Protein Fat Crude Fibre Calcium Phosphate H Filth Test 3 GENERAL METHODS Trace Elements Preservatives Antioxidants Colouring Matters 4 SUGAR AND PRESERVES Sugars Syrup Liquid Glucose Honey Jams Marmalade Fruit Curd Mincemeat 5 CEREALS AND STARCH PRODUCTS Starches Cereals Flour Bread Cake Custard and Blancmange Powders 6 BAKING POWDERS EGGS SALAD CREAM 7 FRUIT AND VEGETABLE PRODUCTS Fruits Vegetables Tomato Puree Tomato Ketchup Fruit Juices Soft Drinks Syrup of Blackcurrant 8 BEVERAGES Tea Coffee Coffee Essences Chicory Cocoa Chocolate Cocoa Butter 9 HERBS AND SPICES 10 FERMENTATION PRODUCTS Wines Spirits Beer Cider Vinegar 11 FLESH FOODS TABLE JELLIES Meat Meat Products including Sausages Meat Extract Fish Fish Products Gelatine Table Jellies Agar Isinglass 12 DAIRY PRODUCTS I Milk Cream Condensed Milk Dried Milk Infant Foods Casein Malted Milk 13 DAIRY PRODUCTS II Butter Margarine Cheese Ice Cream 14 OILS AND FATS Lard Suet Olive Oil Group Determination of the Fat soluble Vitamins Mineral Oil in Food 15 MISCELLANEOUS Salt Iodised Salt Canned Soups Dried Soups Butter Confectionery Saccharin Tablets APPENDIX I The Preservatives Regulations APPENDIX II Emulsifying and Stabilising Agents APPENDIX III Claims regarding Vitamin and Mineral Contents APPENDIX IV Filters for Absorptiometry APPENDIX V Factors for Volumetric Analysis APPENDIX VI Weights and Measures INDEX *Beverage Journal* ,1906
Journal of the Society of Chemical Industry ,1920 *The Chemical Trade Journal and Chemical Engineer* ,1947
Exploring Chemistry (Loose-Leaf) Matthew Johll,2012-05-04 Matthew Johll s Exploring Chemistry overs the standard topics for the nonmajors course in the typical order but each chapter unfolds in the context of a single case study that helps students connect what they are learning to real life situations For example students work through the often difficult topics of molecular structure gas laws and organic chemistry by learning about the development of powerful new chemotherapy drugs new technologies for screening airline passengers and the creation of biodegradable biopolymers It s the same same case driven approach that Johll uses in his acclaimed Investigating Chemistry now in its Third Edition but Exploring Chemistry goes beyond the other book s specific focus on examples from forensic science to use real life stories from cooking athletics genetics green chemistry and more Annual Report New York (State). Dept. of Agriculture and Markets,1926
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