Project Report on

"Determine amount of acid present in different cold drinks

Submitted By

M.Sc. SEM III Students (Roll No.26 to 31)

Guided By

Dr. D.R. Fudani

Associate Professor

Sir P.T.Science College, Modasa

Submitted To

P. G. Department of Chemistry

Sir P.T.Science College, Modasa

SIR P.T.SCIENCE COLLEGE, MODASA

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Certificate

This is to certify that project report entitled **"Determine Amount of Acid Present in Different Cold Drinks"** are carried out by students mentioned below. They have been satisfactorily completed their project work for academic year 2022-23. The project has been approved as it satisfies the academic requirement in respect of project work prescribed for the Master of Science. M.Sc-III

Roll no.	Student's name
26	Amin Mayank Karsanbhai
27	Patel Mitali J.
28	Prajapati Mitalkumari V.
29	Rathod Mitulkumar D.
30	Patel Nehi V.
31	Pranami Nikunj D.

Place: Modasa

Signature of Guide

D.R.Fudani

(Dr. D.R .Fudani)

SIR P. T. SCIENCE COLLEGE 32 127 MODASA

Signature of P. G. In charge

DR. M.P. GONGIWALA
HEAD
P.G. DEPARTMENT OF CHEMISTRY
SIR. P.T. SCIENCE COLLEGE
MODASA

(Dr. M. P. Gongiwala)

CONTENTS

AIM:- ***COMPARATIVE STUDY AND QUALITATIVE ANALYSIS OF DIFFERENT BRANDS OF COLD DRINKS AVAILABLE IN MARKET.***

INTRODUCTION :- The era of cold drinks began in 1952 but the indianization of industry marked its beginning with launching of Limca and goldspot by parley group of companies. Since, the beginning of cold drinks was highly profitable and luring, many multinational companies launched their brands in India like pepsi and coke.

Now days, it is observed in general that majority of people viewed Sprite, Miranda, and Limca to give feeling of lightness, while pepsi and thumps up to activate pulse and brain.

THEORY:- Cold drinks of different brands are composed of alcohol, carbohydrates, carbon dioxide, phosphate ions etc. These soft drinks give feeling of warmth, lightness and have a tangy taste which is liked by everyone. Carbon dioxide is responsible for the formation of froth on shaking the bottle.

The carbon dioxide gas is dissolved in water to form carbonic acid which is also responsible for the tangy taste.

Carbohydrates are the naturally occurring organic compounds and are major source of energy to our body. General formula of carbohydrates is CX(H2O)Y.

On the basis of their molecule size carbohydrates are classified as:

Monosaccharide, Disaccharide and Polysaccharides. Glucose is a monosaccharide with formula C6H12O6. It occurs in free state in the ripen grapes in bones and also in many sweet

fruits. It is also present in human blood to the extent of about 0.1%.It is reducing in nature. Sucrose is one of the most useful disaccharides in our daily life. It is widely distributed in nature in juices, seeds and also in flowers of many plants. The main source of sucrose is sugar cane juice which contain 15-20% sucrose and sugar beet which has about 10-17% sucrose. The molecular formula of sucrose is C12H22O11. It is produced by a mixture of glucose and free dose. It is non-reducing in nature.

Cold drinks are a bit acidic in nature and their acidity can be measured by finding their pH value. The pH values also depends upon the acidic contents such as Citric acid and Phosphoric acid.

APPARTUS

> Test tube

> Test tube holder

> Test tube stand

> Stop watch

>Beaker

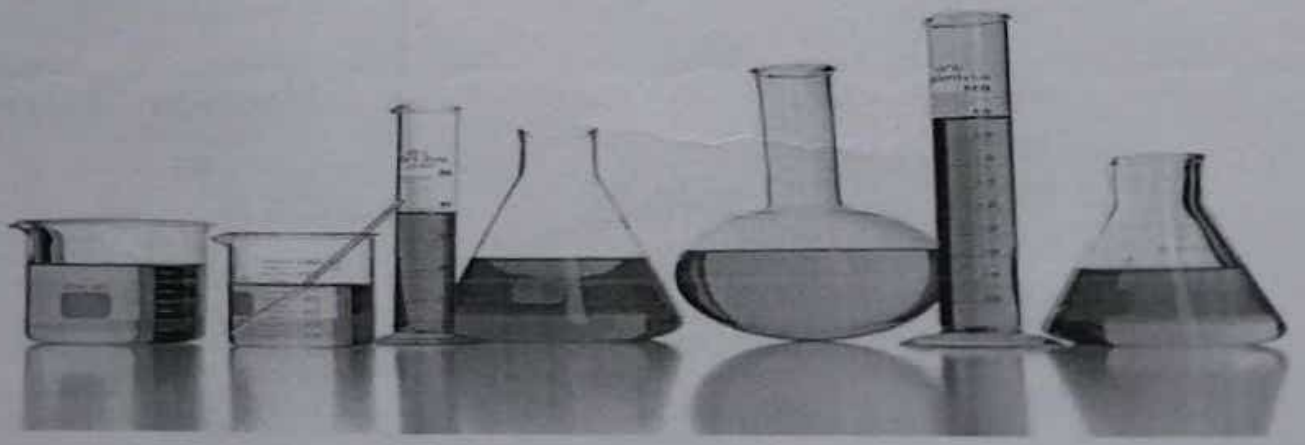
>Burner

>pH paper / pH strip and pH scale

> China dish

> Wire gauge

> Water bath



CHEMICAL REQUIRED

>Iodine solution

>Potassium iodine

>Sodium hydroxide

>Lime water

>Concentrated HNO_3

>Ammonium molybdate

-:DETECTION OF pH:-

1-2 Drops of the sample of cold drinks of each brand was taken and put on the pH paper. The change in the color of the pH paper was noticed and was compared with the standard pH scale.

Observation:

Sr. No.	Name of drink	Color changes	pH value
1	Coca cola	Pink	2.5 – 3.0
2	Sprite	Red	3.0

3	Limca	Pinkish	4.0
4	Fenta	Light orange	3.0-4.0
5	Maaza	Redish	3.0

Inference:

Soft drinks are generally Acidic because of the presence of Citric acid and Phosphoric acid. pH values of cold drinks of different brands are different due to the variation in amount of acidic contents.

-:TEST FOR CARBON DIOXIDE:-

Experiment: As soon as the bottles were opened, one by one the sample was passed through lime water. The lime water turned milky.

Observation:-

Sr. No.	Name of drinks	Time taken In second
1	Coca cola	26.5
2	Sprite	21
3	Limca	35
4	Fanta	36
5	Maaza	32

Inference:-

All the soft drinks contents dissolved carbon dioxide in water. The carbon dioxide dissolved in water to form carbonic acid, which is responsible for its tangy taste.

Chemical Reaction:-

$$Ca(OH)_{2(S)} + CO_{2(g)} \longrightarrow CaCO_{3(S)} + H2O_{(liq)}$$

-:TEST FOR SUCROSE:-

5 ml samples of each brands of cold drinks was taken in a china dish and heated very strongly until changes occur. Black colored residue left confirms the presence of sucrose in cold drinks.

Observation:-

Sr. No.	Name of drinks	Observation
1	Coca cola	Black residue
2	Sprite	Black residue
3	Limca	Black residue
4	Fanta	Black residue

5	Maaza	Black residue

Inference:-

All the brands of the cold drinks contain sucrose. But amount of sucrose varies in amount of sucrose.

-:TEST FOR PHOSPHATE:-

Sample of each brand of cold drink was taken in a separate test tube and Ammonium molybdate followed by con. HNO_3 was added to it, the solution was taken heated and the color of the precipitate confirms the presence of phosphate ions.

Observation:-

Sr. No.	Name of drinks	Observation
1	Coca cola	Canary yellow
2	Sprite	Canary yellow
3	Limca	Canary yellow
4	Fanta	Canary yellow
5	Maaza	Canary yellow

Inference:-

All the soft drinks contain phosphate ions which are detected by the presence of phosphate when canary yellow obtained.

Chemical Reaction:-

$NaHPO_4 + 12(NH_4)2MoO_4 + 21HNO_3 + 3H+ \longrightarrow$

$(NH_4)_3PO_4.12MoO_3 + 21HN4NO3 + 12H2O$

-:TEST FOR ALCOHOL:-

All samples of each brand of cold drinks are taken in sample test tube and iodine followed by potassium iodide and sodium hydroxide solution is added to each test tube. Then the test tube are heated in hot water bath for 30 min. yellow colored precipitate confirmed the presence of alcohol in cold drinks.

Observation:-

Sr. No.	Name of drinks	Observation
1	Coca cola	Yellow ppt
2	Sprite	Yellow ppt
3	Limca	Yellow ppt
4	Fanta	Yellow ppt
5	Maaza	Yellow ppt

Inference:-

All the brands of cold drinks contain alcohol.

Chemical Reaction:-

$CH_3CH_2OH + 4I_2 + 6NaOH \longrightarrow CHI_3 + HCOONa + 5NaI + 5H_2O$

-:RESULT:-

After conducting several tests, it was concluded that the different brands of cold drinks namely...

Coca cola, Sprite, Limca, Fanta, Maaza

All contains Carbon dioxide, Sucrose, Phosphate ion, Alcohol. All are acidic in nature. On comparing the pH value of different brands. Coca cola is most acidic and Limca is least acidic of all the five brands.

pH value of Coca cola is nearly equal to disinfectant which is harmful for body.

-:CONCLUSION:-

- Soft drinks are little more harmful than sugar solution. As they contain sugar in large amount which cause "Diabetes"
- Soft drinks can cause weight gain as they interfere with the body natural ability to suppress hunger feeling.
- Soft drinks have ability to dissolve the calcium so they are also harmful for our bones.
- Soft drinks contain "Phosphoric acid" which has a ph of 2.8. So they can dissolve a nail in about 4 days.
- For transportation of soft drinks syrup the commercial truck must use the hazardous matter place cards reserved for highly consive material.
- Soft drinks have also ability to remove blood so they are very harmful to our body.

-:USES OF COLD DRINKS:-

- Cold drinks can be used as toilet cleaners.
- They can remove rust spots from chrome car humpers.
- They clean corrosion from car battery terminals.
- Soft drinks are used as an excellent "detergent" to remove grease from clothes.
- They can loose a rusted bolt.

THANK YOU