

V.M. Inter College
S. Puranpur (Pilibhit)

Chemistry Project
on
Determination of the
contents of Cold drinks

Project Prepared By:

Name:

Class:

Roll No.:

Aim

Comparative study & Qualitative analysis of different brands of Cold Drinks available in Market.

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Certificate

This is to certify that this dissertation titled **“To determine the contents of the Cold Drinks”** submitted by _____ to Chemistry department of Saraswati Vidya Mandir Inter College, Puranpur (Pilibhit) was carried under guidance and supervision during the academic year 2016-2017.

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Last but not least I thank my parents for their encouragement and support in my humble venture.

Name:

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INTRODUCTION

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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 $C_x(H_2O)_x$.

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

Monosaccharide, Disaccharides and Polysaccharides.

Glucose is a monosaccharide with formula $C_6H_{12}O_6$. 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%.

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 $C_{12}H_{22}O_{11}$. It is produced by a mixture of glucose and fructose. It is non-reducing in nature whereas glucose is reducing.

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

APPARATUS

- Test Tube
- Test Tube Holder
- Test Tube Stand
- Stop Watch
- Beaker
- Burner
- pH Paper
- Tripod Stand
- China Dish
- Wire Gauge
- Water Bath

CHEMICALS REQUIRED

- Iodine Solution
- Potassium Iodine
- Sodium Hydroxide
- Fehling's A & B Solution
- Lime Water
- Concentrated HNO_3
- Benedict Solution
- Ammonium Molybdate

DETECTION OF PH

EXPERIMENT

Small samples of cold drinks of different brands were taken in a test tube and put on the pH paper. The change in the color of pH paper was noticed and was compared with the standard pH scale.

OBSERVATION

SR. NO.	NAME OF THE COLD DRINK	COLOUR CHANGE	pH VALUE
1	COCA COLA		
2	SPRITE		
3	LIMCA		
4	FANTA		

INFERENCE

Soft drinks are generally acidic because of the presence of citric acid and phosphoric acid. pH values of cold drink 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 THE COLD DRINK	TIME TAKEN (SEC.)	CONCLUSION
1	COCA COLA		
2	SPRITE		
3	LIMCA		
4	FANTA		

INFERENCE

All the soft drinks contain dissolved carbon dioxide in water. The carbon dioxide (CO_2) dissolves in water to form carbonic acid, which is responsible for its tangy taste.

CHEMICAL REACTION INVOLVED



TEST FOR GLUCOSE

FEHLING'S SOLUTION TEST

Small samples of cold drinks of different brands were taken in a test tube and a few drops of Fehling's A solution and Fehling's B solution was added in equal amount. The test tube was heated in a water bath for 10 minutes. Appearance of brown precipitate confirmed the presence of glucose in cold drinks.

OBSERVATION

SR. NO.	NAME OF THE COLD DRINK	OBSERVATION	CONCLUSION
1	COCA COLA		
2	SPRITE		
3	LIMCA		
4	FANTA		

INFERENCE

All the samples gave positive test for glucose with Fehling's (A & B) solutions. Hence all the cold drinks contain glucose.

TEST FOR PHOSPHATE

EXPERIMENT

Small samples of each brand of cold drinks were taken in separate test tubes and Ammonium Molybdate followed by concentrated Nitric Acid (HNO_3) was added to it. The solution was heated. Appearance of canary-yellow precipitate confirmed the presence of phosphate ions in cold drinks.

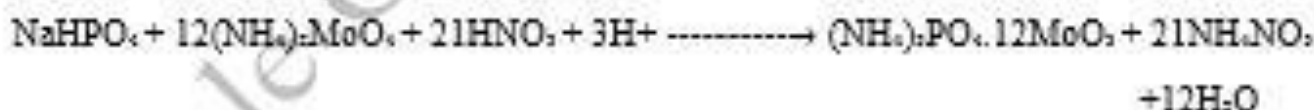
OBSERVATION

SER. NO.	NAME OF THE COLD DRINK	OBSERVATION	CONCLUSION
1	COCA COLA		
2	SPRITE		
3	LIMCA		
4	FANTA		

INFERENCE

All the soft drinks samples gave positive test for phosphate ions. Hence all the cold drinks contain phosphate.

CHEMICAL REACTION INVOLVED



TEST FOR ALCOHOL

EXPERIMENT

Small samples of each brand of cold drinks were taken in separate test tubes and Iodine followed by Potassium Iodide and Sodium Hydroxide (NaOH) solution was added to each test tube. Then the test tubes were heated in hot water bath for 30 minutes. Appearance of yellow colored precipitate confirmed the presence of alcohol in cold drinks

OBSERVATION

Sr. No.	NAME OF THE COLD DRINK	OBSERVATION	CONCLUSION
1	COCA COLA		
2	SPRITE		
3	LIMCA		
4	FANTA		

INFERENCE

All the cold drinks samples gave positive test for alcohol. Hence all the cold drinks contain glucose.

CHEMICAL REACTION INVOLVED



TEST FOR SUCROSE

EXPERIMENT

5 ml samples of each brand of cold drinks were taken in separate china dishes and were heated very strongly until changes occur. Black colored residue left confirmed the presence of sucrose in cold drinks.

OBSERVATION

SR. NO.	NAME OF THE COLD DRINK	OBSERVATION	CONCLUSION
1	COCA COLA		
2	SPRITE		
3	LIMCA		
4	FANTA		

INFERENCE

All the brands of cold drinks contain sucrose. But amount of sucrose varies in each brand of drink. Fanta contains highest amount of sucrose.

RESULT

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

1. Coca Cola
2. Sprite
3. Limca
4. Fanta

All contains glucose, alcohol, sucrose, phosphate and carbon dioxide. All cold drinks are acidic in nature. On comparing the pH value of different brands Coca Cola is the most acidic and Limca is least acidic of all the four brands taken.

CARBON DIOXIDE

Among the four samples of cold drinks taken, Sprite has the maximum amount of dissolved carbon dioxide and Fanta has the minimum amount of dissolved carbon dioxide.

CONCLUSION

DIS-ADVANTAGES OF COLD DRINKS

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

USES OF COLD DRINKS

1. Cold drinks can be used as toilet cleaners.
2. They can remove rust spots from chrome car humpers.
3. They clean corrosion from car battery terminals.
4. Soft drinks are used as an excellent 'detergent' to remove grease from clothes.
5. They can lose a rusted bolt.