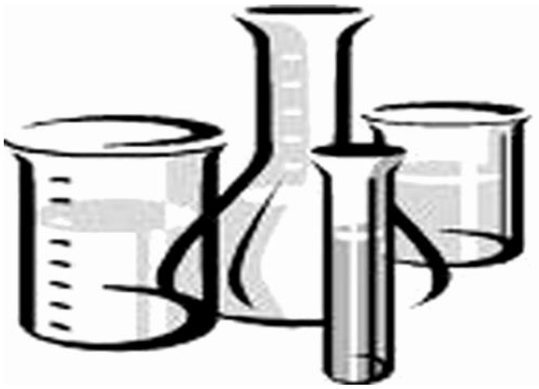
SRNK GOVT. DEGREE COLLEGE
BANSWADA
CHEMISTRY PROJECT

On

DETERMINATION OF THE CONTENTS OF COLD DRINKS



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AIM

Comparative study and qualitative Analysis of different brands of Cold drinks available in market.

CERTIFICATE

This is hereby to certify that, the original and genuine Investigation work has been carried out to investigate about the subject matter and the related data collection and investigation has been completed group, sincerely and satisfactorily by B.Sc. Students, SRNK Government Degree College, Banswada regarding their project titled "**DETERMINATION OF THE CONTENTS OF COLD DRINKS**" .

Teacher's Signature

ACKNOWLEDGEMENT

It would be our utmost pleasure to express my sincere thanks to My Chemistry Teacher **Mr. K.ASHOK ,CH.BHAGAVAN REDDY & G.LAXMA GOUD** in providing a helping hand in this project. Their valuable guidance, support and supervision all through this project titled "**DETERMINATION OF THE CONTENTS OF COLD DRINKS**", are responsible for attaining its present form **B.Sc. students.**

PURPOSE

In recent days, soft drink brands were put into various questions regarding their purity. That they contain harmful pesticide, which arouses many interests in knowing its contents because we have been drinking them for years. We wanted to confirm that whether the charge imposed on these brands are true or not. Another fact which inspired me to do this project is that we are in touch with qualitative analysis whose knowledge with other factors helped us to do so.

CONTENTS:

INTRODUCTION

The era of cold drinks began in 1952 but the industrialization in India marked its beginning with launching of Thumps-up and Gold spot 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 a days, it is observed in general that majority of people viewed Sprite and Miranda 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 $C_x (H_2O)_y$.

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 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:

1. Iodine Solution
2. Potassium Iodide
3. Sodium Hydroxide
4. Fehling's A & B Solution
5. Concentrated HNO3
6. Benedict Solution
7. Ammonium Molybdate

DETECTION OF PH

EXPERIMENT

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

OBSERVATION

S. NO.	NAME OF THE COLD DRINK	COLOUR CHANGE	pH VALUE
1	FANTA	LIGHT ORANGE	3-4
2	LIMCA	RED	3-3.5
3	COCA COLA	PINK	2.5-3
4	SPRITE	RED	3
5	THUMPSUP	PINKISH	4

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 GLUCOSE

EXPERIMENT

Glucose is a reducing sugar acid. Its presence is detected by the following Test:-

1. **BENEDICTS'S REAGENT TEST:**

Small samples of cold drinks of different brands were taken in a test tube And a few drops of Benedict's reagent were added. The test tube was heated For few seconds. Formation of reddish colour confirmed the presence of Glucose in cold drinks.

OBSERVATON

S. NO	NAME OF THE DRINK	OBSERVATION	CONCLUSION
1	FANTA	REDDISH COLOUR PRECIPITATE	GLUCOSE IS PRESENT
2	LIMCA	REDDISH COLOUR PRECIPITATE	GLUCOSE IS PRESENT
3	COCA COLA	REDDISH COLOUR PRECIPITATE	GLUCOSE IS PRESENT
4	SPRITE	REDDISH COLOUR PRECIPITATE	GLUCOSE IS PRESENT
5	THUMPSUP	REDDISH COLOUR PRECIPITATE	GLUCOSE IS PRESENT

INFERENCE

All the samples gave positive test for glucose with Benedict's reagent.
Hence all the drinks contain glucose.

2. 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.

OBSERVATON

S. NO.	NAME OF THE DRINK	OBSERVATION	CONCLUSION
1	FANTA	REDDISH BROWN PRECIPITATE	GLUCOSE IS PRESENT
2	LIMCA	REDDISH BROWN PRECIPITATE	GLUCOSE IS PRESENT
3	COCA COLA	REDDISH BROWN PRECIPITATE	GLUCOSE IS PRESENT
4	SPRITE	REDDISH BROWN PRECIPITATE	GLUCOSE IS PRESENT
5	THUMPSUP	REDDISH BROWN PRECIPITATE	GLUCOSE IS PRESENT

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 (HNO3) was added to it. The solution was heated. Appearance of canary-yellow precipitate confirmed the presence of phosphate ions in cold drinks.

OBSERVATON

S. NO.	NAME OF THE DRINK	OBSERVATION	CONCLUSION
1	FANTA	CANARY-YELLOW	PHOSPHATE IS PRESENT
2	LIMCA	CANARY-YELLOW	PHOSPHATE IS PRESENT
3	COCA COLA	CANARY-YELLOW	PHOSPHATE IS PRESENT
4	SPRITE	CANARY-YELLOW	PHOSPHATE IS PRESENT
5	THUMPSUP	CANARY-YELLOW	PHOSPHATE IS PRESENT

INFERENCE

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

CHEMICAL REACTION INVOLVED

NaHPO4 + 12(NH4)2MoO4 + 21HNO3 + 3H+ ----------□ (NH4)3PO4.12MoO3 + 21HN4NO3 + 12H2O

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 coloured precipitate confirmed the presence of alcohol in cold drinks.

OBSERVATON

S.NO.	\ NAME OF THE DRINK	OBSERVATION	CONCLUSION
1	FANTA	YELLOW PRECIPITATE	ALCOHOL IS PRESENT
2	LIMCA	YELLOW PRECIPITATE	ALCOHOL IS PRESENT
3	COCA COLA	YELLOW PRECIPITATE	ALCOHOL IS PRESENT
4	SPRITE	YELLOW PRECIPITATE	ALCOHOL IS PRESENT
5	THUMPSUP	YELLOW PRECIPITATE	ALCOHOL IS PRESENT

INFERENCE

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

CHEMICAL REACTION INVOLVED

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

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 coloured residue left confirmed the presence of sucrose in cold drinks.

OBSERVATON

S. NO.	NAME OF THE DRINK	OBSERVATION	CONCLUSION
1	FANTA	BLACK RESIDUE	SUCROSE IS PRESENT
2	LIMCA	BLACK RESIDUE	SUCROSE IS PRESENT
3	COCA COLA	BLACK RESIDUE	SUCROSE IS PRESENT
4	SPRITE	BLACK RESIDUE	SUCROSE IS PRESENT
5	THUMPSUP	BLACK RESIDUE	SUCROSE IS PRESENT

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. Fanta
2. Limca
3. Coca Cola
4. Sprite
5. Thumps up

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 FANTA is least acidic of all the four brands taken.

CONCLUSION:

DIS-ADVANTAGES OF COLD DRINKS

Soft drinks are little more harmful than sugar solution. As they contain sugar in large amount which cause problems in diabetes patients.
Soft drinks can cause weight gain as they interfere with the body's natural ability to suppress hunger feeling.
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.
For transportation of soft drinks syrup the commercial truck must use the hazardous matter place cards reserved for highly conceive material.
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.

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