

CHEMISTRY PROJECTS FOR CLASS 12

(DETERMINATION OF THE CONTENTS OF Soft Drink)-5TH PART

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AIM



Comparative Study and
Qualitative Analysis of Different
Brands of Cold Drinks available in
market.

PURPOSE

In recent days, soft drink brands have been put into various questions regarding their purity .News flashed that they contain harmful pesticides which aroused interest in knowing about the composition of these drinks consumed highly worldwide.

I wanted to confirm if the claims were true. Another fact that made me to do so was this that I am in touch with the QUALITATIVE ANALYSIS. SO I chose this project on DETERMINATION OF CONTENTS OF COLD DRINKS out of curiosity.

INTRODUCTION

The era of cold drinks began in 1952 but the industrialization in India marked its beginning with launching of Lima and Gold spot by parl group of companies. Since the beginning of cold drinks was highly profitable and luring, many MNCs launched their brands in India like coca cola and Pepsi.



Nowadays, it has been observed in general that majority of people viewed Sprite, Limca and Mirinda to give feeling while Pepsi and thumps up to activate pulse and brain.

THEORY

Cold drinks of different brands are composed of carbon dioxide, Alcohol carbohydrates phosphate ions Glucose and Sucrose These soft drinks give feelings of warmth lightness and have a tangy taste which is liked by everyone CO_2 gas is dissolved in the drink to provide it with tangy taste.

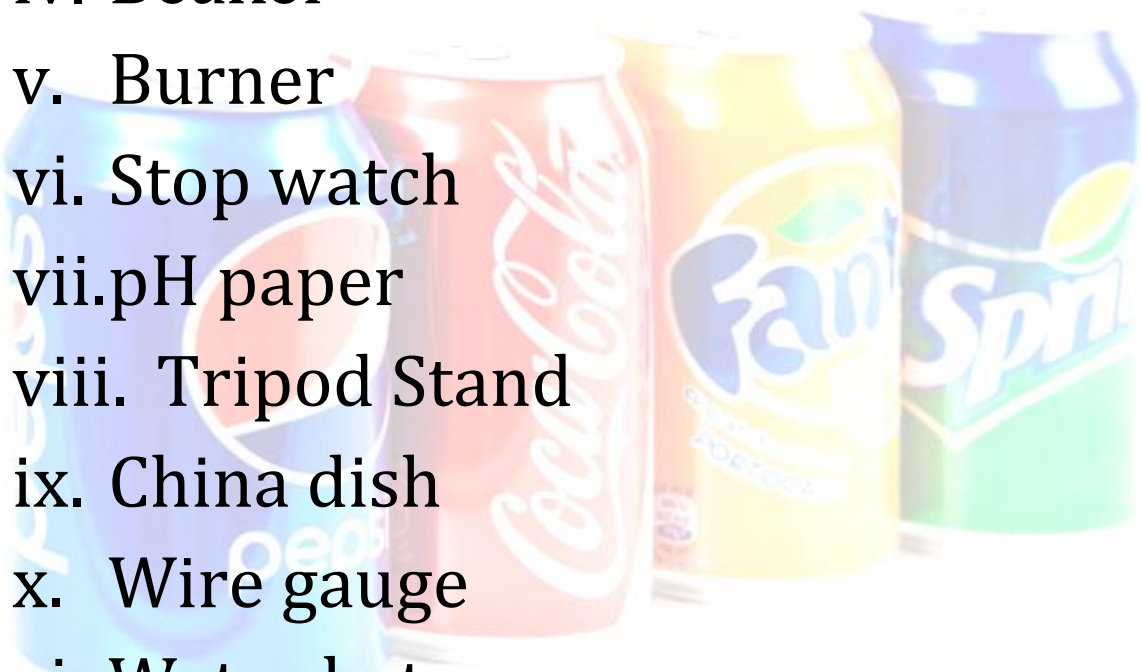
Carbohydrates are naturally occurring organic compounds and are major source of energy to our body general formula of carbohydrates is $\text{C}_x(\text{H}_2\text{O})_y$.

On the basis of molecular size carbohydrates are classified as monosaccharide disaccharide and polysaccharide glucose is a monosaccharide with formula $\text{C}_6\text{H}_{12}\text{O}_6$. Sucrose is a disaccharide and is widely distributed in juices seeds and flowers.

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

APPARATUS

- i. Test tube
- ii. Test tube holder
- iii. Test tube stand
- iv. Beaker
- v. Burner
- vi. Stop watch
- vii. pH paper
- viii. Tripod Stand
- ix. China dish
- x. Wire gauge
- xi. Water bat



CHEMICALS REQUIRED

- i. Iodine solution
- ii. Potassium iodide
- iii. Sodium Hydroxide
- iv. Benedict's reagent
- v. Conc. HND
- vi. Ammonium Molybdate
- vii. Lime water



DETECTION OF pH VALUE

Experiment:

Small samples of cold drinks of different brands were taken in a test tube and put on the pH

Paper was noticed and was composed with the standard pH

Observation:

SL No.	Name of drink	Color change	pH Value
1	Coca Cola	Pink	2.5-3
2	Sprite	Red	3
3	Limca	Pinkish	4
4	Fanta	Light Orange	3-4

Inference:

Soft drinks are generally acidic because of CITRIC ACID and PHOSPHORIC ACID pH Value of different cold drink brands is different due to variation in amount of acidic contents

TEST FOR CARBON DIOXIDE

Experiment:

As soon as the bottles were opened one by one the samples were passed through LIME WATER the lime water turns MILKY.

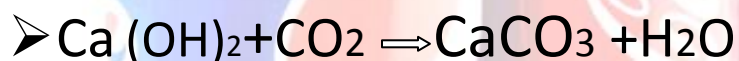
Observation:

Sl. No	Name of drink	Time taken (in sec)	Conclusion
1	Coca Cola	26.3	CO ₂ present
2	Sprite	21	CO ₂ present
3	Limca	25	CO ₂ present
4	Fanta	36	CO ₂ present

Inference

All soft drinks contain dissolved CO₂

Chemical Reaction involved:



TEST FOR GLUCOSE

Experiment:

Glucose is reducing sugar acid its presence is detected by the following test.

Benedict's reagent test:

Small sample of cold drink of different brands were taken in a test tube and a few drops of Benedict's reagent were added to it test tube was heated for a few seconds Reddish coloration confirmed the presence of glucose in the samples.

Observation:

SL No.	Name of drink	Observation	Conclusion
1	Coca Cola	Reddish color ppt	Glucose is present
2	Sprite	Reddish color Ppt	Glucose is present
3	Limca	Reddish color ppt	Glucose is present
4	Fanta	Reddish color ppt	Glucose is present

Inference All the samples gave positive test for glucose with Benedict's reagent hence all of them contain glucose

TEST FOR ALCOHOL

Experiment:

Small samples of cold drinks of different brands were taken in separate test tube and iodine followed by Potassium iodide and Sodium Hydroxide (NaOH) solution was heated in hot water for 30 minutes. Presence of yellow colored ppt. confirmed the presence of alcohol.

Observation:

SL No .	Name of drink	Observation	Conclusion
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1	Coca Cola	Yellow ppt	Alcohol present
2	Sprite	Yellow ppt	Alcohol present
3	Limca	Yellow ppt	Alcohol present
4	Fanta	Yellow ppt	Alcohol present

Inference:

All samples contain as they give positive test for it

TEST FOR PHOSPHATE

Experiment:

Small samples of the drinks of different brands were taken in separate test tubes and ammonium Molybdate followed by nitric acid HNO_3 was added to it. Presence of canary yellow ppt confirmed the presence of phosphate ions in cold drinks.

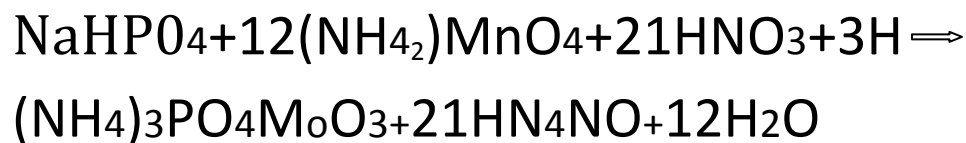
Observation:

SL No	Name of drink	Observation	Conclusion
1	Coca Cola	Canary yellow ppt	Phosphate present
2	Sprite	Canary yellow ppt	Phosphate present
3	Limca	Canary yellow ppt	Phosphate present

Inference:

All samples contain phosphate as they give positive test for it

Chemical Reactions involved:



TEST FOR SUCROSE

Experiment:

Small samples of cold drinks of different brands were taken in separate china dish and were strongly heated until changed occurred. Black colored residue left confirmed the presence of sucrose in the taken samples.

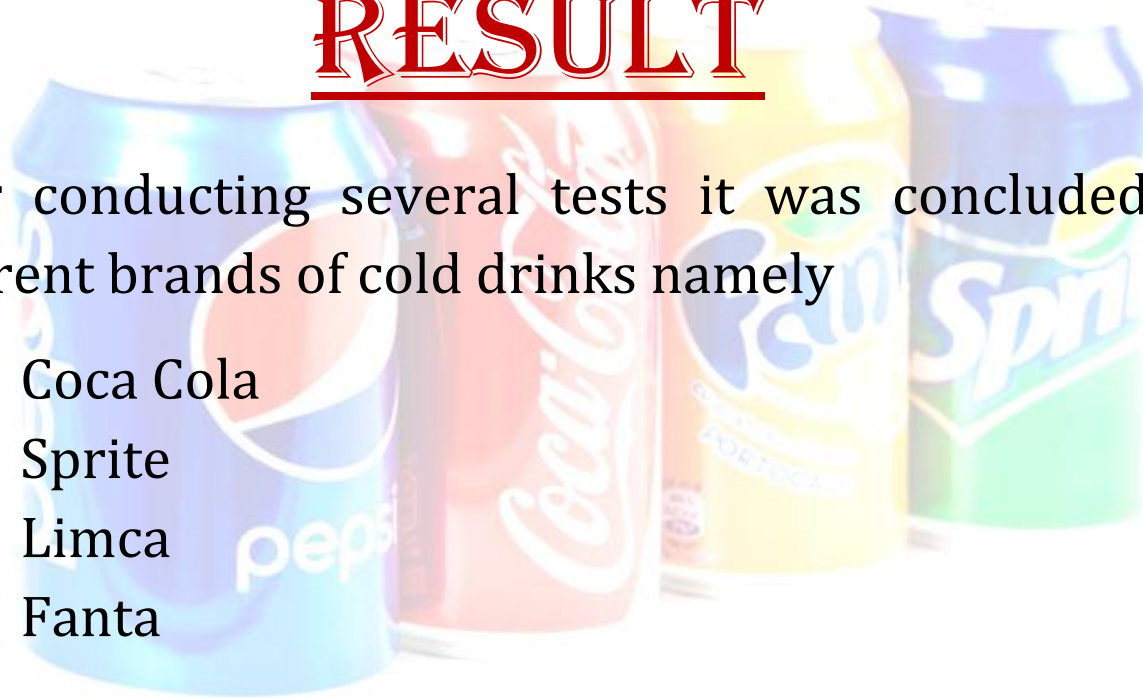
Observation:

Sl No.	Name of drink	Observation	Conclusion
1	Coca Cola	Black residue	Sucrose present
2	Sprite	Black residue	Sucrose present
3	Limca	Black residue	Sucrose Present
4	Fanta	Black residue	Sucrose present

Inference:- All cold drinks contain sucrose fanta contains it in higher amount.

RESULT

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

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- A background image showing four cans of cold drinks. From left to right, they are: a blue can of Pepsi, a red can of Coca-Cola, a yellow can of Fanta, and a green can of Sprite. The cans are slightly out of focus and overlap each other.
- i. Coca Cola
 - ii. Sprite
 - iii. Limca
 - iv. Fanta

All contain glucose sucrose alcohol, phosphate and carbon Dioxide all of them are acidic in nature.

On comparison we found out that coca cola is most acidic and limca is least acidic amongst all the four brands taken,. Sprite had highest amount of CO_2 dissolved while Fanta had the least.

CONCLUSION

Disadvantages of Cold Drinks:

- Soft drinks are a little more harmful than sugar solution as they contain sugar in large amount which causes problem for diabetic patients.
- They contain weight gain.
- They contain phosphoric acid which has a pH value of 2.8 which is enough to dissolve a nail in about four days.
- Soft drinks have the ability to remove blood so they are very harmful to body.

Uses of Cold Drinks:

- Cold drinks can be used as toilet cleaners.
- They can remove rust spots from chrome car hampers
- They can lose a rust bolt
- They can clean corrosion from car battery terminals.

BIBLIOGRAPHY

Followings books and websites were a source for my project:

1. Laboratory Manual of Chemistry
2. Dinesh Companion Chemistry

Websites used:

[https:// www.google.com](https://www.google.com)

[Https: // www.wikipedia.com](https://www.wikipedia.com)

[https:// www.unoregon.edu](https://www.unoregon.edu)



TEACHER'S SIGNATURE.....