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Date : 2022-23

Certificate

This is to certify that following are the list of Experiential Learning through Project work/ Field Work/ Internship during the year 2022-23

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Date : 2022-23

Department of Chemistry

Title of the Project Work: Sterilization of Water by Using Bleaching Powder

B.Sc VI Semester- 2022-23

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Department of Chemistry

STUDENTS PROJECT WORK 2022-23

Topic: Sterilization of Water by using Bleaching Powder

CLASS: B.Sc VI SEM **BATCH-1**

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ACKNOWLEDGEMENT

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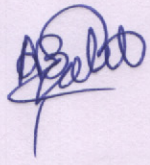
I would like to express my special thanks of gratitude to my teacher "Prof. A.S.Bagawan Sir" as well as our HOD & Principal who gave me the golden opportunity to do this wonderful project which also helped me in doing a lot of research and I came to know about so many new things. I am really thankful to them.



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DEPARTMENTOF CHEMISTRY

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This is to certify that, Mr/Mrs. Akshaykumar Patil
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STERILIZATION OF WATER BY USING BLEACHING POWDER

Abstract: This project look at the technique called Sterilization of Water by using Bleaching Powder, which is used to purify water and make it fit for drinking. Water is an important and essential ingredient in our quest for survival on this planet. It is very essential for carrying out various metabolic processes in our body and also to carry out Hemoglobin throughout the body. A daily average of 1 gallon per man is sufficient for drinking and cooking purposes. With the increasing world population, the demand for drinking water has also increased dramatically and therefore it is very essential to identify resources of water from which we can use water for drinking purposes. Since many available resources of water do not have it in drinkable form, in order to fulfill the demand of water, it needs to be purified and supplied in an orderly and systematic way.

Purification of Water:

There are many methods for the purification of water, such as:

1. Boiling
2. Filtration
3. Bleaching powder treatment
4. SODIS (Solar Water Disinfection)

Need for a Stable Purification Technique:

Therefore we need a purification technique which can be used anytime and anywhere, does not require the use of any third party content and which is also economically feasible on both normal scale and large scale. Hence we look at the method of purification of water using the technique of treatment by bleaching powder commonly known as "Chlorination".

Introduction:

In 1854 it was discovered that a cholera epidemic spread through water. The outbreak seemed less severe in areas where sand filters were installed. British scientist John Snow found that the direct cause of the outbreak was water pump contamination by sewage water. He applied chlorine to purify the water, and this paved the way for water disinfection. This discovery led to governments starting to install municipal water filters (sand filters and chlorination). So in the

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1890s America started building large sand filters to protect public health. These turned out to be a success. Instead of slow sand filtration, rapid sand filtration was now applied. Subsequently, Dr. Fuller found that rapid sand filtration worked much better when it was preceded by coagulation and sedimentation techniques.

But the victory obtained by the invention of chlorination did not last long. After some time the negative effects of this element were discovered. Chlorine vaporizes much faster than water, and it was linked to the aggravation and cause of respiratory disease. Water experts started looking for alternative water disinfectants. In 1902 calcium hypo chlorite and ferric chloride were mixed in a drinking water supply in Belgium, resulting in both coagulation and disinfection. To this day, bleaching powder remains the most commonly used drinking water disinfectant. Almost all systems use some type of chlorine-based process to disinfect water. In addition to controlling disease-causing organisms, chlorination offers a number of benefits including:

- Reduces many disagreeable tastes and odors
- Eliminates slime bacteria, molds and algae that commonly grow in water supply reservoir
- Removes chemical compounds that have unpleasant tastes and hinder disinfection
- Helps remove iron and manganese from raw water.

For more than a century, the safety of drinking water supplies has been greatly improved by the addition of bleaching powder. However, bleaching powder also reacts with the organic matter, naturally present in water, such as decaying leaves thus forming a group of chemicals known as disinfection by-products. When used with modern water filtration methods, chlorine is effective against virtually all microorganisms. Bleaching powder is easy to apply and small amounts of the chemical remain in the water as it travels in the distribution system from the treatment plant to the consumer's tap, thus ensuring prevention of recontamination of water.

But what is bleaching powder and how is it prepared?

Bleaching powder or Calcium hypochlorite is a chemical compound with formula $Ca(ClO)2$. This chemical is considered to be relatively stable and has greater available chlorine than sodium hypochlorite (liquid bleach). It is prepared by either calcium process or sodium process.

Calcium Process

$$2Ca(OH)2 + 2\ Cl2 \rightarrow Ca(ClO)2 + CaCl2 + 2\ H2O$$

Sodium Process

$$2Ca(OH)2 + 3Cl2 + 2NaOH \rightarrow Ca(ClO)2 + CaCl2 + 2H2O + 2NaCl$$

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What are the actual processes involved in disinfecting and purifying water?

The combination of following processes is used for municipal drinking water treatment worldwide:

1. Pre-chlorination - for algae or any biological growth control

2. Aeration - removal of dissolved iron and manganese

3. Coagulation - for flocculation

4. Coagulant aids also known as polyelectrolyte's - to improve coagulation and for thicker floc formation

5. Sedimentation - for solids separation i.e. removal of suspended solids trapped in the floc

6. Filtration - for removal of carried over floc

7. Disinfection - for killing bacteria

Out of these processes, the role of Bleaching powder is only in the last step i.e. for Disinfection of water.

Activity:

Aim: To determine the dosage of bleaching powder required for sterilization or disinfection of different samples of water.

Requirements: Burette, titration flask, 100ml graduated cylinder, 250ml measuring flask, weight box, glazed tile, glass wool.Bleaching Powder, Glass wool, 0.1 N $Na_2S_2O_3$ solution, 10% KI solution, different samples of water, starch solution.

Pre-Requisite Knowledge:

1. Bleaching powder when dissolved in contains dissolved chlorine, liberated by the action of bleaching powder with water.

$$Ca(OCl)_2+H_2O \longrightarrow Ca(OH)_2+Cl_2$$

2. The amount of Chlorine present is determined by treating a known volume with excess of 10% KI solution, when equivalent amount of I_2 is liberated. The I_2, thus liberated is then estimated by titrating it against a standard solution of Sodium thiosulphate, using starch solution as indicator.

$$Cl_2+2KI \longrightarrow 2KCl+I_2$$

$$2Na_2S_2O_3\ I_2+ \longrightarrow Na_2S_4O_6+2NaI$$

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Procedure:

1. Preparation of bleaching powder solution Weigh accurately 2.5g bleaching powder and transfer it to a 250ml conical flask. Add about 100ml of distilled water. Stopper the flask and shake it vigorously. The suspension thus obtained is filtered through glass wool and the filtrate is diluted with water to make the volume 250ml. The solution obtained is 1% bleaching powder solution.

2. Take 20ml of bleaching powder solution in a stoppered conical flask and add it to 20ml of 10% KI solution. Stopper the flask and shake it vigorously. Titrate this solution against 0.1N Na2S2O3 solution taken in the burette. When the solution in the conical flask becomes light yellow in color, add about 2ml starch solution. The solution now becomes blue in color. Continue titrating till the blue color just disappears. Repeat the titration to get a set of three concordant readings.

Observation:

- Volume of bleaching powder sol. taken 20ml
- Volume of KI solution added 20ml
- Volume of different samples of water 100ml

Titration Table for Distilled Water

Sr.No.	Initial Reading	Final Reading	Volume of 0.2N Na2S2O3 Used in ml.	Mean Volume
1	2.0	10.1	8.1	**8.2**
2	10.1	18.4	8.3	
3	18.4	26.6	8.2	

Titration Table for Tank Water

Sr.No.	Initial Reading	Final Reading	Volume of 0.2N Na2S2O3 Used in ml.	Mean Volume
1	15.1	25.2	10.1	**10.1**
2	25.2	35.2	10.0	
3	35.2	45.4	10.2	

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Titration Table for Pond Water

Sr.No.	Initial Reading	Final Reading	Volume of 0.2N Na2S2O3 Used in ml.	Mean Volume
1	7.2	12.1	4.9	**4.8**
2	12.1	16.9	4.8	
3	16.9	21.9	4.7	

Calculations:

TANK WATER (Sample I)

Amount of bleaching powder used to disinfect 100ml of tap water = (8.2 – 10.1) ml of 0.2 N of Na2S4O6 solution

= 1.9ml. Of 0.2 N of Na2S4O6 solution

Since, 250ml bleaching powder solution contains 2.5g bleaching powder

Thus, 1ml of bleaching powder solution contains bleaching powder =2.5/250 = 0.01g

Also, 20ml of bleaching powder solution = 8.2ml of 0.2N of Na2S2O3

So 1ml of Na2S2O3 solution = 20/8.2 ml of bleaching powder solution.

Volume of bleaching powder solution used to disinfect 100ml of water = 1.9x20/8.2ml.

1.9 x 20/8.2 ml. of bleaching powder solution =1.9x20x0.01/8.2 (gm) Bleaching Powder

Amount of bleaching powder used to disinfect 1 ltr. of water = 1.9x20x0.01x1000/8.2x100 = 0.4634gm

POND WATER (Sample II)

Amount of bleaching powder used to disinfect 100ml of water.

= (8.2 – 4.8) ml of 0.2 N Na2S2O3 solution

= 3.4ml

Accordingly,

Volume of Ca(OCl)2 solution required to disinfect 1lt. of water

= 3.4x20x0.01x1000/8.2x100

= 0.8293 gm.

Result:

Amount of the given samples of bleaching powder required to disinfect one liter of water:-

Samples I = 0.4634gm

Samples II = 0.8293 gm

Since amount of bleaching powder required for disinfecting POND WATER is more than that required for TANK WATER, thus it can be concluded that former contains more impurities.

Conclusion:

While household bleaching solutions are widely available but it is not recommended to use it for household water treatment. If bleach is used for household water treatment system, concentration should be regularly checked and proper dosage strategy should be developed recommended by authorized organizations.

Bleaching Powder water treatment is useful in disinfecting water in places or conditions where boiling method cannot be practiced.

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Department of Chemistry

Title of the Project Work: To Study the Presence of Insecticides and Pesticides in Various Fruits and Vegetables

B.Sc VI Semester- 2022-23

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STUDENTS PROJECT WORK 2022-23

Topic: To Study the Presence of Insecticides and Pesticides in Various Fruits and Vegetables

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ACKNOWLEDGEMENT

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I would like to express my special thanks of gratitude to my teacher "Prof. A.S.Bagawan Sir" as well as our HOD & principal who gave me the golden opportunity to do this wonderful project which also helped me in doing a lot of research and I came to know about so many new things. I am really thankful to them.

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TO STUDY THE PRESENCE OF INSECTICIDES AND PESTICIDES IN VARIOUS FRUITS AND VEGETABLES

Abstract: To Study the Presence of Insecticides and Pesticides in Various Fruits and Vegetables. In the past decade there has been a tremendous increase in the yields of various crops to meet the demand of overgrowing population, achieved by using pesticides and insecticides._These are chemicals that are sprayed over crop to protect it from pests. For example: DDT, BHC, zinc phosphide, Mercuric chloride, dinitrophenol, etc. All pesticides are poisonous chemicals and are used in small quantities with care. Pesticides are proven to be effective against variety of insects, weeds and fungi and are respectively called insecticides, herbicides and fungicides. Most of the pesticides are non-biodegradable and remain penetrated as such into plants, fruits and vegetables. From plants they transfer to animals, birds and human beings who eat these polluted fruits and vegetables. Inside the body they get accumulated and cause serious health problems. These days preference is given to biodegradable insecticides like Malathion. The presence of insecticides residues in even raw samples of wheat, fish, meat, butter etc. have aroused the concern of agricultural administrators, scientists and health officials all over the world to put a check over the use of insecticides and to search for non insecticidal means of pest control.

Materials required: Mortar and pestle, Beakers, Funnel, Glass rod, Filter paper, China dish, Water bath, Tripod stand, Fusion tube, Knife, Test tube

Requirements: Samples of various fruits and vegetables, Alcohol, Sodium Metal, Ferric Chloride, Ferrous Sulphate Crystals, Distilled Water and Dil. Sulphuric Acid

Theory:

Nitrogen present in organic compounds is detected by "Lassssaiigne''ss Tesstt".. The elements present in the compound are converted from covalent form into the ionic form by fusing the compound with sodium metal. Following reaction take place:

$$Na + C + N \xrightarrow{\triangle} NaCN$$

(Sodium cyanide)

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Cyanide of sodium so formed on sodium fusion is extracted from the fused mass by boiling it with distilled water. This extract is known as sodium fusion extract.

Procedure:

1) Take different types of fruits and vegetables and cut them into small pieces separately.

2) Transfer the cut pieces of various fruits and vegetables into it separately and crush them.

3) Take different kinds for each kind of fruits and vegetables and place the crushed fruits and vegetables in these beakers and add 100 ml of alcohol to each of these.

4) Stir well and filter.

5) Collect the filtrate in separate china dishes, evaporate the alcohol by heating the china dishes one by one over a water bath and let the residue dry in the oven.

6) Heat a small piece of sodium in a fusion tube, till it melts.

7) Then add one of the above residues from the china dish to this fusion tube and heat it till red hot.

8) Drop the hot fusion tube in a china dish containing about 10 ml of distilled water.

9) Break the tube and boil the contents of the china dish for about 5 minutes.

10) Cool and filter the solution.

11) Collect the filtrate.

12) To the filtrate add 1 ml of freshly prepared ferrous sulphate solution and warm the contents.

13) Then add 2-3 drops of ferric chloride solution and acidify with dilute HCl.

14) If a blue or green ppt. or coloration is obtained it indicates the presence of nitrogen containing insecticides.

15) Repeat the test of nitrogen for residues obtained from other fruits and vegetables and record the observation.

Observations:

Sl.No	Name of the Fruit or Vegetable	Test for the presence of Nitrogen	Presence of Insecticide or Pesticide Residue
1	Apple	Positive	Yes
2	Banana	Positive	Yes
3	Potato	Positive	Yes
4	Cucumber	Positive	Yes

Conclusion:

It is concluded that from the above observations, that each fruit or vegetable contains nitrogenous insecticide or pesticide residues in it.

Bibliography:

NCERT Chemistry- XII

Comprehensive Practical Chemistry- XII

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Title of the Project Work: Study of the Effect of Acids and Bases on the Tensile Strength of Fibers

B.Sc VI Semester- 2022-23

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Department of Chemistry

STUDENTS PROJECT WORK 2022-23

Topic: Study of the Effect of Acids and Bases on the Tensile Strength of Fibers

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ACKNOWLEDGEMENT

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Vinayak

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Examination Seat No: S2031694 **Class:B.Sc VISem**

This is to certify that, Mr/Mrs. Vinayak . A. Pujari
Has satisfactorily completed Project work on ***"Amount of Casein Present In Different Samples of Milk"****,under our supervision in M.G.V.C Arts, Commerce and Science College Muddebihal.*

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AMOUNT OF CASEIN PRESENT IN DIFFERENT SAMPLES OF MILK

Introduction:

1. MILK:

Milk is a nutrient-rich, white liquid food produced by the mammary glands of mammals. It is the primary source of nutrition for infant mammals (including humans who are breastfed) before they are able to digest other types of food. Early-lactation milk contains colostrums, which carries the mother's antibodies to its young and can reduce the risk of many diseases. It contains many other nutrients including protein and lactose. Interspecies consumption of milk is not uncommon, particularly among humans, many of whom consume the milk of other mammals. As an agricultural product, milk, also called dairy milk, is extracted from farm animals during or soon after pregnancy. Dairy farms produced about 730 million tones of milk in 2011, from 260 million dairy cows. India is the world's largest producer of milk, and is the leading exporter of skimmed milk powder, yet it exports few other milk products. The ever increasing rise in domestic demand for dairy products and a large demand-supply gap could lead to India being a net importer of dairy products in the future. The United States, India, China and Brazil are the world's largest exporters of milk and milk products. China and Russia were the world's largest importers of milk and milk products until 2016 when both countries became self-sufficient, contributing to a worldwide glut of milk. Throughout the world, more than six billion people consume milk and milk products. Over 750 million people live in dairy farming households. Milk as a whole contains water, minerals (Ca, K, Na and trace metals), vitamins (A, D, K), carbohydrates, proteins and fats. The proportion of the sevaries from source to source. Average composition of milk from different sources is given ahead.

Source of Milk	Watre (%)	Mineral (%)	Protein (%)	Fats (%)	Carbohydrate (%)
Cow	87.1	0.7	3.4	3.9	4.9
Human	87.4	0.2	1.4	4	4.9
Goat	87	0.7	3.3	4.2	4.8
Sheep	82.6	0.9	5.5	6.5	4.5

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2. CASEIN:

Casein (from Latin caseus"cheese") is a family of related phosphor proteins (αS1, αS2, β, κ). These proteins are commonly found in mammalian milk, comprising c. 80% of the proteins in cow's milk and between 20% and 45% of the proteins in human milk. The j Casein has a wide variety of uses, from being a major component of chees , to use as a food additive. The most common form of casein is Sodium caseinate. As a food source, casein supplies amino acids,carbohydrates, and two essential elements, calcium and phosphorus. Casein contains a high number of proline residues,which do not interact. There are also no disulfide bridges. As a result, it has relatively little tertiary structure. It is relatively hydrophobic, making it poorly soluble in water. It is found in milk as a suspension of particles, called casein micelles, which show only limited resemblance with surfactant-type micelles in a sense that the hydrophilic parts reside at the surface and they are spherical. However, in sharp contrast to surfactant micelles, the interior of a casein micelle is highly hydrated. The caseins in the micelles are held together by calcium ions and hydrophobic interactions. Any of several molecular models could account for the special conformation of casein in the micelles.

One of them proposes the micellar nucleus is formed by several sub micelles, the periphery consisting of micro vellosities of κ-casein. Another model suggests the nucleus is formed by casein-interlinked fibrils. Finally, the most recent model proposes a double link among the caseins for gelling to take place. All three models consider micelles as colloidal particles formed by casein aggregates wrapped up in soluble κ-casein molecules. The iso electric point of casein is 4.6. Since milk's pH is6.6, casein has a negative charge in milk. The purified protein is water-insoluble.

While it is also insoluble in neutral salt solutions, it is readily dispersible in dilute alkalis and in salt solutions such as aqueous sodiumoxalate and sodium acetate. The enzyme trypsin can hydrolyze a phosphate-containing peptone. It is used to form a type of organic adhesive

Ca^{2+}-Caseinate + $2CH_3COOH(aq.) \rightarrow Casein(s) + (CH_3COOH)_2Ca$

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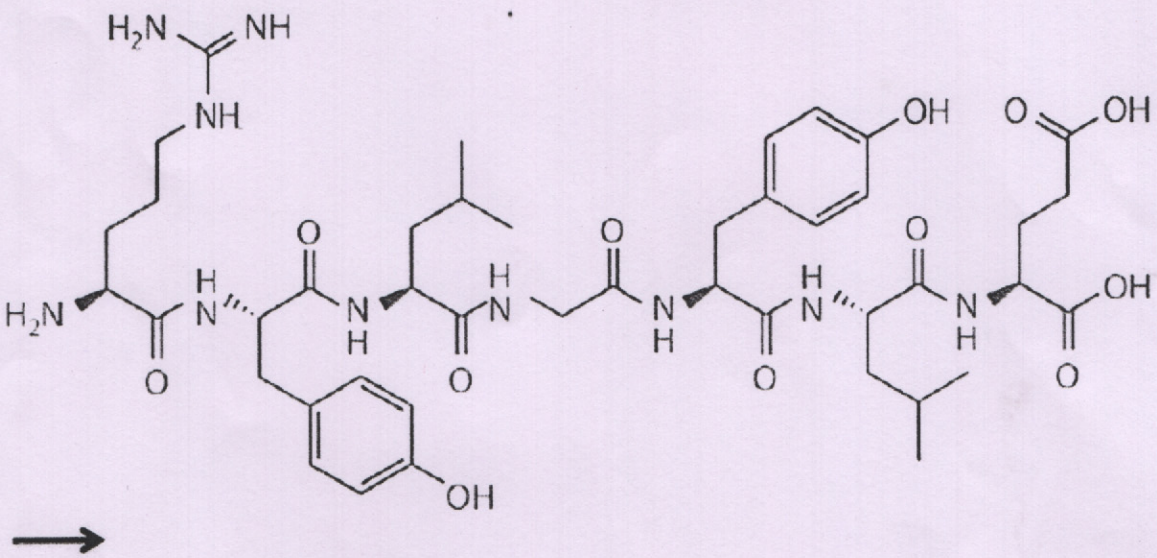
Structure of Casein



3. OBJECTIVE:

To study the quantity of casein present in different samples of milk .

4. MATERIALS REQUIRED

1. Conical flask
2. Beakers
3. Funnel
4. Measuring cylinder(100 mL)
5. Watch glass
6. Filter paper
7. 1% acetic acid
8. Different samples of milk
9. Glass rod

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Chemicals Required

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2. Ammonium sulphate solution
3. 1% Acetic acid solution

5. PROCEDURE:

1. A clean dry beaker has been taken follow by putting 20 ml of cow milk into it on adding 20 ml of saturated ammonium sulphate solution slowly and with string fat along with casein was precipitated out.
2. The solution was filtered and transfered precipitate in another beaker. adding about 30 ml water to precipitate. only casein dissolve in water forming milky solution leaving fat undissolve.
3. The milky solution was heated to about 40 degrees celsius and adds 1 % acetic acid solution dropwise and when casein get precipitated.
4. Filter and precipitate washed with water and the precipitate was allowed to dry.

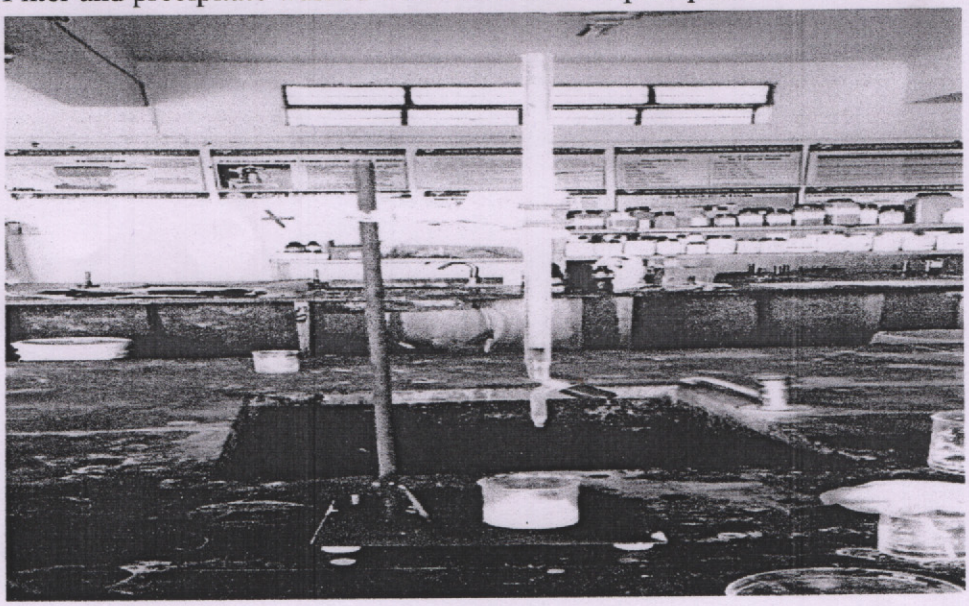

Fig.2.Filtration

5. Weight the dry solid mass in previously weight watch glasses.

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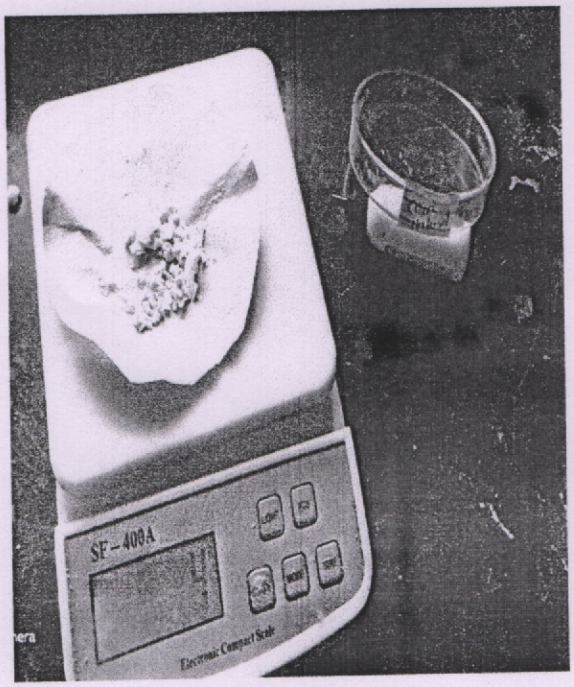

Fig.3 Wet Product wt.

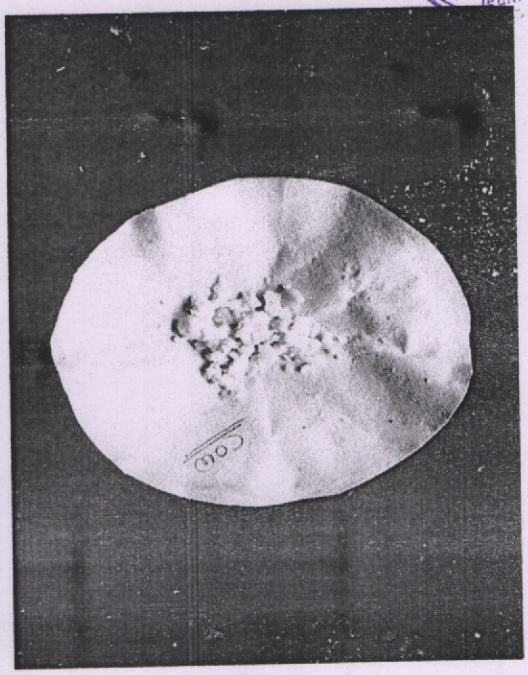

Fig.4.Final Product

6. Same process of occur in other animal milk.

Animal Name	**Quantity Of Milk**	**Acetic Acid (PPT Form)**	**Ammonium Sulphate**
Cow	20 ml	4 gram	20 ml
Buffalo	20 ml	5 gram	20 ml
Goat	20 ml	19 gram	20 ml
	Warm 20 ml	18gram	20 ml

Note:

The goat milk this process not properly work in this project

In this process firstly add acetic acid mix it well and the heat them PPT get form

Calculation:

Let them ammonium sulphate present in powder form then convert in dilute solution

The conversion of powder to dilute solution

According to Google

800ml →761 gram

200ml→?

Then

761×20/800=19.025 gram

20ml=19.025 gram

Dissolving ammonium sulphate in water after then filter out

6. OBSERVATIONS:

MILK (ANIMAL NAME)	MILK (HEATED) WT. OF CASEIN	(NORMAL MILK) WT.OF CASEIN
COW	_	1 GRAM
GOAT	1.4 GRAM	1.2 GRAM
BUFFALO	_	0.8 GRAM

7. USES:

A. Buffalo milk provides high amount of calcium, a mineral needed for bone development.

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B. Casein is a major protein found in milk, comprising about 89% of buffalo milks total protein content.

C. Cow milk helps in improving the metabolism of the body and therefore prevents weight gain.

D. Cow milk is a good source of protein and calcium, as well as nutrients including vitamin, B12 and iodine.

E. Goat milk is a powerhouse of protein, healthy fats, vitamins, iron and other essential nutrients.

F. Goat milk keeps your bones and teeth stronger, due to its high calcium content.

8. RESULT:

According to our analysis of various samples of milk, we conclude that:

Goat milk heated wt. of casein 1.4 gram.

Goat normal milk wt. of casein 1.2 gram.

9. PRECAUTIONS:

A. During filtration, press the casein formed.

B. Use only the required amount of acid for complete precipitation.

C. Use only fresh milk.

D. Use same amount of each sample for the experiment.

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Ref. No. : .....

Date : 2022-23

Department of Chemistry

Title of the Project Work: Amount of Casein Present In Different Samples of Milk

B.Sc VI Semester- 2022-23

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03	S2031657	Ramesh A Hampanagoudar
04	S2031658	Rohan Sulibhavi
05	S2031659	Sabaalam Dhakani
06	S2031661	Samarth Patil
07	S2031671	Shivaraj Meti
08	S2031674	Shreekant Lamani

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STUDENTS PROJECT WORK 2022-23

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CLASS: B.Sc VI SEM **BATCH-3**

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2	S2031656	Ramanagouda
3	S2031657	Ramesh Amarappa Hampanagoudar
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ACKNOWLEDGEMENT

I would like to express my special thanks of gratitude to my teacher "Prof. A.S.Bagawan Sir" as well as our HOD & principal who gave me the golden opportunity to do this wonderful project which also helped me in doing a lot of research and I came to know about so many new things. I am really thankful to them.

Rons

S.G.V.C VIDYA PRASARK TRUST'S

M.G.V.C ARTS, COMMERCE AND SCIENCE COLLEGE

MUDDEBIHAL-586212

DEPARTMENTOF CHEMISTRY

CERTIFICATE

Examination Seat No: **Class:B.Sc VISem**

This is to certify that, Mr/Mrs. Ramesh D. H
Has satisfactorily completed Project work on "Amount of Casein Present In Different Samples of Milk",under our supervision in M.G.V.C Arts, Commerce and Science College Muddebihal.

Staff Member In-charge

Head Department of Chemistry

Head, Dept. of Chemistry,
M.G.V.C. Arts, Com. & Science College
MUDDEBIHAL - 586212.

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AMOUNT OF CASEIN PRESENT IN DIFFERENT SAMPLES OF MILK

Introduction:

1. MILK:

Milk is a nutrient-rich, white liquid food produced by the mammary glands of mammals. It is the primary source of nutrition for infant mammals (including humans who are breastfed) before they are able to digest other types of food. Early-lactation milk contains colostrums, which carries the mother's antibodies to its young and can reduce the risk of many diseases. It contains many other nutrients including protein and lactose. Interspecies consumption of milk is not uncommon, particularly among humans, many of whom consume the milk of other mammals. As an agricultural product, milk, also called dairy milk, is extracted from farm animals during or soon after pregnancy. Dairy farms produced about 730 million tones of milk in 2011, from 260 million dairy cows. India is the world's largest producer of milk, and is the leading exporter of skimmed milk powder, yet it exports few other milk products. The ever increasing rise in domestic demand for dairy products and a large demand-supply gap could lead to India being a net importer of dairy products in the future. The United States, India, China and Brazil are the world's largest exporters of milk and milk products. China and Russia were the world's largest importers of milk and milk products until 2016 when both countries became self-sufficient, contributing to a worldwide glut of milk. Throughout the world, more than six billion people consume milk and milk products. Over 750 million people live in dairy farming households. Milk as a whole contains water, minerals (Ca, K, Na and trace metals), vitamins (A, D, K), carbohydrates, proteins and fats. The proportion of the sevaries from source to source. Average composition of milk from different sources is given ahead.

Source of Milk	Watre (%)	Mineral (%)	Protein (%)	Fats (%)	Carbohydrate (%)
Cow	87.1	0.7	3.4	3.9	4.9
Human	87.4	0.2	1.4	4	4.9
Goat	87	0.7	3.3	4.2	4.8
Sheep	82.6	0.9	5.5	6.5	4.5

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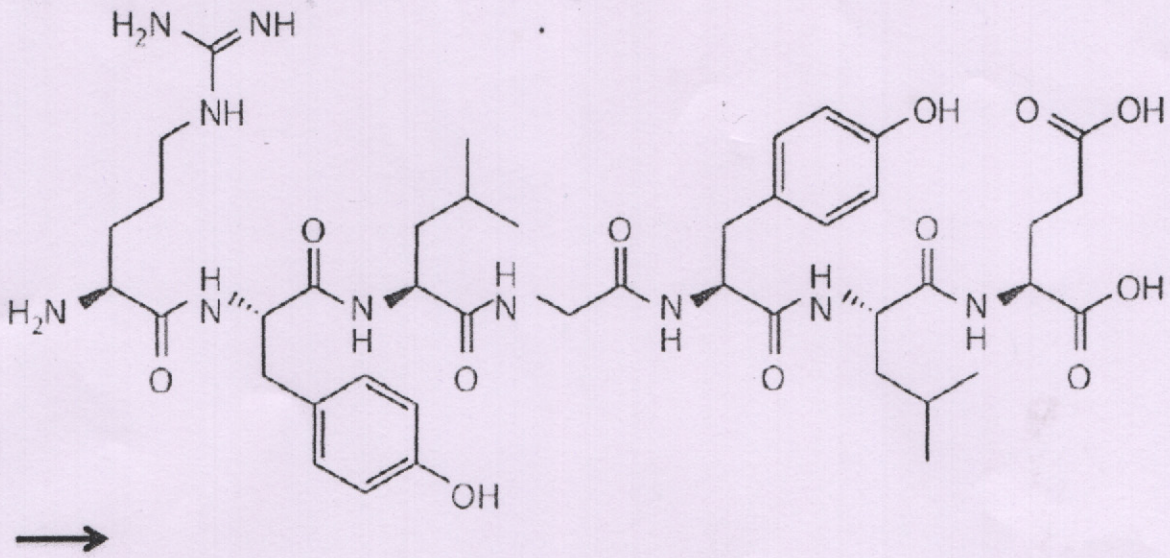

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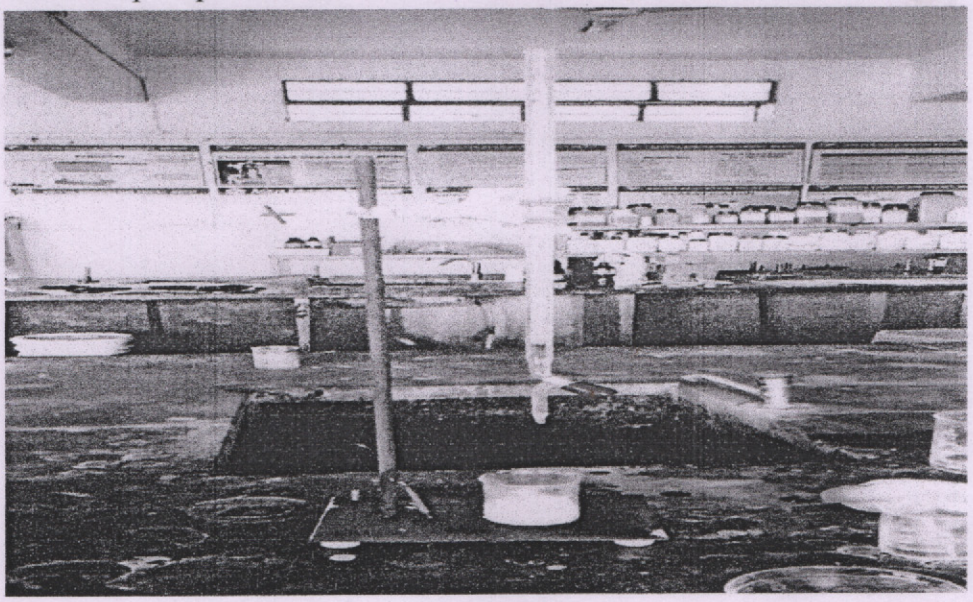

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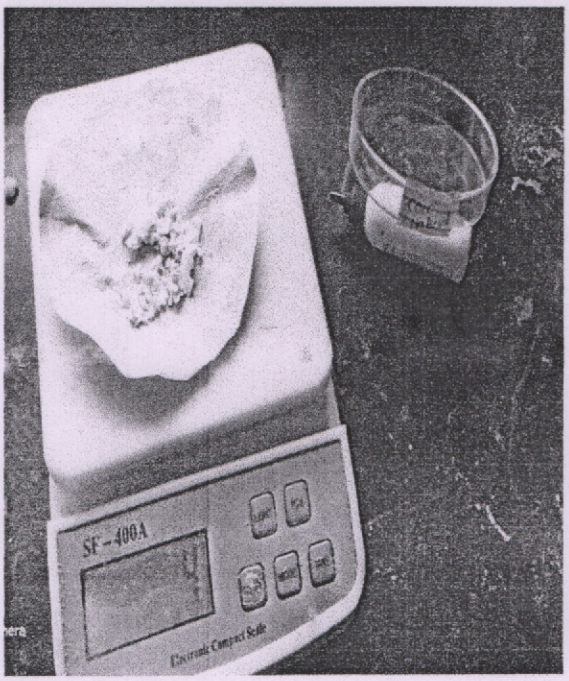
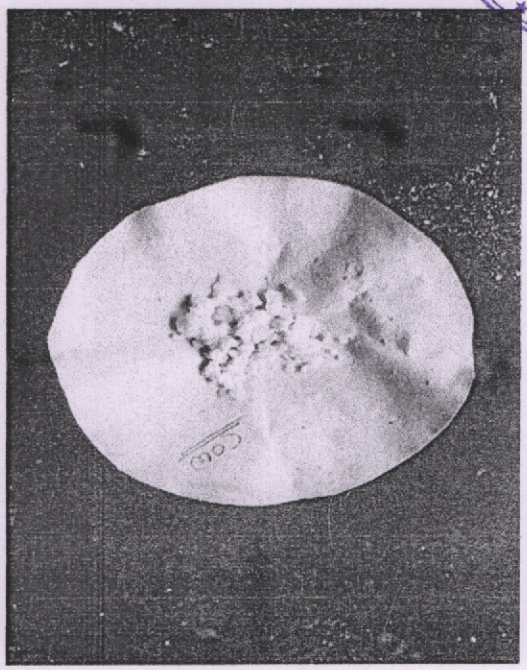


Fig.3.Wet Product wt.



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