Student Study project on

LIME STONE ROCK- ACID RAIN EFFECT

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DEPARTMENT OF CHEMISTRY

KAKATIYA GOVERNMENT COLLEGE, HANAMKONDA

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CERTIFICATE

This is to certify that the project report entitled a study project on "LIME STONE ROCK- ACID RAIN EFFECT" submitted to head department of chemistry Kakatiya Government College, Hanamkonda. It was carried out by the following students B.Aravind, E.Sonu sukumar,G.Lavanya, B.Mahesh,L.Prem Sagar B.Krushikethan , M.Shiva Kumar S.NavyaSri ,G.Ramesh,T.Mahesh under my guidance.

Signature of head department

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Introduction

This experiment is based on acid rain, but what is acid rain? It is a broad term referring to more than natural amount of sulfuric acid and nitric oxide. Acid rain is referring to rain with a pH4 or lower. Natural causes are lightning strikes, volcano eruptions and also dead and decaying foods. However, the main effect is man-made, burning of the coal; this lets of sulfuric oxides, the other one is cars, trucks etc…; they let nitric acid into the atmosphere. However, we will be substituting this with vinegar.

My aim in this scientific investigation is to see how concentrates of vinegar (H20 + CH302H) mixed with water effect the weight of limestone (CaC03- Calcium carbonate i.e. chalk, marble) over a period of time. We will look at the change and decrease in the weight, over the time of 5 minutes.

The technical way it affects the limestone is the neutralizing reaction (because vinegar is acid and limestone is alkali) is the CaC03(Calcium Carbonate) reacting with H2S04 (Sulfuric acid) = CaSO4 (Gypsum) + H2CO3 (Carbonic acid) results in production of CO2 gas. And this whole neutralization reaction results in the limestone dissolving and crumbling. This reaction can be mimicked by using vinegar on egg shells. Limestone will neutralize strong acids, at least partially. However, in real-life application limestone cannot be depends on to neutralize acidic polluted water because they chips are very easily.

When, sulfuric, and nitric acids react with the calcite limestone, the calcite melts. It exposed areas of buildings and statues, this result in roughened surfaces, less of material, and loss of carved details. This black crust is mainly made of gypsum, a mineral that forms from the reaction

between calcium carbonate and the sulfuric acid. It remains on surfaces that are protected from the rain. Gypsum is white, but the crystals form networks that trap particles of dirt and pollutants, so the crust looks black. Eventually the black crust peels off, leaving crumbling stone.

The beaker with most concentrate of vinegar will reduce the weight of the lime stone the most. Because in background information, more of the neutralization reaction there is the more crumbling, dissolving and forming of the gypsum. The beaker with a more acidic substance (15ml of vinegar and 5ml of water) will reduce the weight of the limestone by the most.

Here Independent variable: The Concentrate of Vinegar

Dependent Variable: The weight of the limestone (after the reaction)

Constant Variable: The original weight of the limestone

Materials

1. Weighing Machine

2. Flask-50ml x6

3. Limestone- 2g x 6

4. Vinegar- 30ml

5. Water

6. Test Tubes

7. Plastic Box

8. Stopwatch

Procedure:

1) Fill the flask with 2g of limestone.

2) Fill the test tube with the different quantity of liquid being used (Ex. 15ml vinegar, 5ml H_2O)

3) Place the flask with 2g of limestone on the weighing machine.

4) Pour the liquid in the test tube into the flask and take the initial weight.

5) Take the change of the weight every 30 seconds to see if it increases, decreases or stays the same for 5 minutes with a stopwatch.

6) Then do this again with different quantities of liquids in the test tubes (ex. 10ml vinegar, 10ml water)

7) Repeat steps 1 to 6 two or three times to get reliable results

Safety Procedure

• Don’t throw materials around and play around with things.

• Be careful with all tools and always help others in need.

• Don’t eat, drink, or smoke while in the laboratory.

• Don’t perform any unauthorized work.

• Don’t pour any liquids that aren’t water down the sink.

• Don’t point the open end of a test tube at yourself or somebody else.

Results

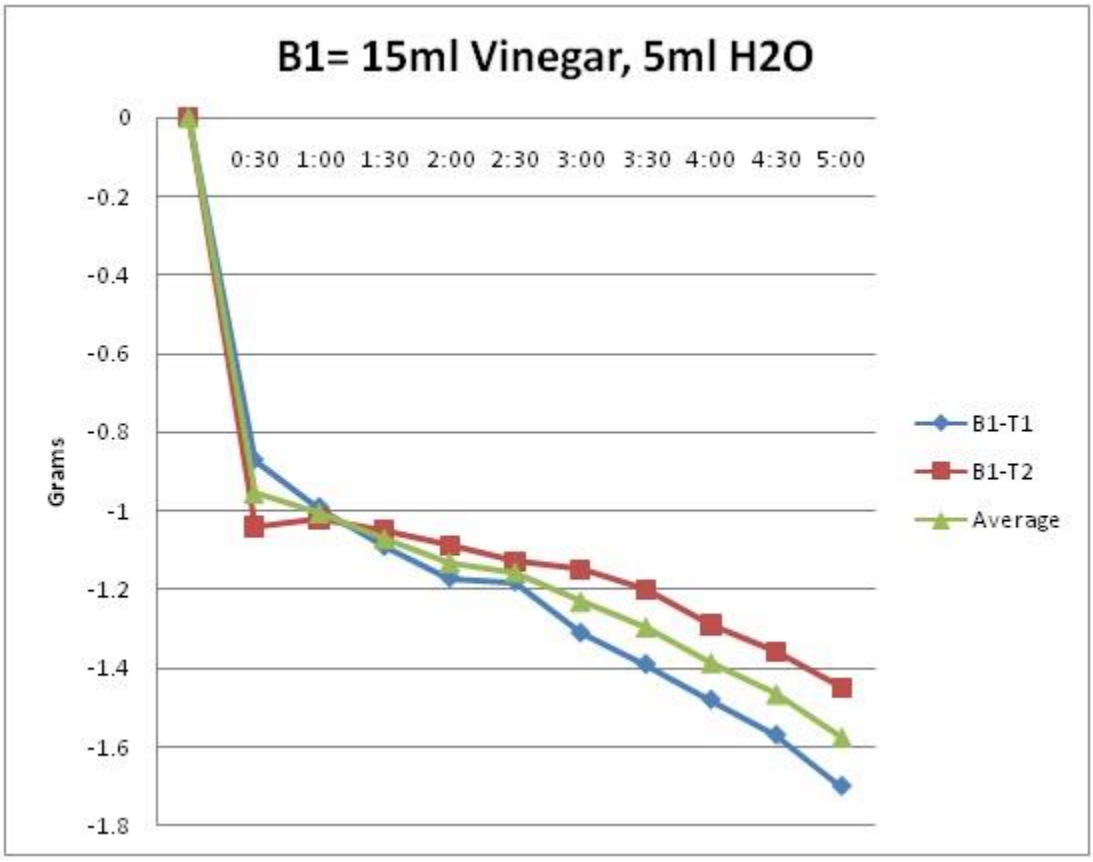
B1= 15ml Vinegar, 5ml H2O

B2= 1Oml Vinegar, 10ml H2O

B3= 5ml Vinegar, 15ml H2O

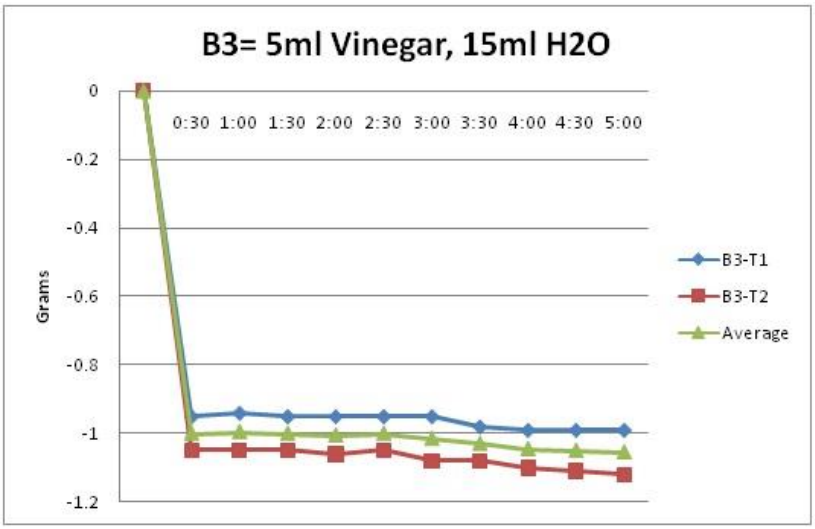
B= Beaker B1= Beaker 1 etc.. T1= Trial 1 T2= Trial 2

This shows the amount it decreased



Time(minutes/sec)		0:30	1:00	1:30	2:00	2:30	3:00	3:30	4:00	4:30
B1-T1	0	-0.87	-0.99	-1.09	-1.17	-1.18	-1.31	-1.39	-1.48	-1.57
B1-T2	0	-1.04	-1.02	-1.05	-1.09	-1.13	-1.15	-1.2	-1.29	-1.36

The initial reaction was all that took place. Because there was so little vinegar there wasn't so much of a reaction. It goes down by a gram and then it went down by very little. Both of the trials gave very similar results and this was just as I expected.



Time		0:30	1:00	1:30	2:00	2:30	3:00	3:30	4:00	4:30	5:00
B3-T1	0	-0.95	-0.94	-0.95	-0.95	-0.95	-0.95	-0.98	-0.99	-0.99	-0.99
B3-T2	0	-1.05	-1.05	-1.05	-1.06	-1.05	-1.08	-1.08	-1.1	-1.11	-1.12

Conclusion

My hypothesis was more or less correct. The results showed that it went down by 1.7 grams. I was able to get such a sound hypothesis from the background information. It show how the neutralization reaction is more when there is a greater concentrate of vinegar. I can conclude that the substance with more vinegar would always have a greater neutralization reaction. However B2 results for one of them came very close to B1.

References:

1. http://en.wikipedia.org/wiki/Vitamin_C

2. http://www.whfoods.com/genpage.php?tname=nutrient&dbid=109

3. http://www.lenntech.com/fruit-vegetable-vitamin-content.htm

4. http://www.google.com.my/search?q=vitamin+c

A STUDY PROJECT ON

ESTIMATION OF HARDNESS OF WATER IN AND AROUND HANAMKONDA CITY

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CERTIFICATE

This is to certify that the project report entitled a study project on "ESTIMATION OF HARDNESS OF WATER IN AND AROUND HANAMKONDA CITY" submitted to head department of chemistry Kakatiya Government College, Hanamkonda. It was carried out by the following students B.Rajkumar ,Ch.Rajinikanth, J.Upender, K.Pavithra, M.Tharun , G.Rakesh ,R.Vandana ,K.Namdev ,V.Omkar, ShaikImam Pasha under my guidance.

Signature of head of department

Signature of the guide

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ESTIMATION OF HARDNESS OF WATER IN AND AROUND HANAMKONDA CITY

Abstract

To measure the hardness of different water samples and study the effects of boiling hard water and consumption.

Theory

Hardness is the degree of ability of water to cause precipitation of insoluble calcium and magnesium salts of higher fatty acids from soap solutions or water that does not lather easily with soap is called hard water. Hardness of water is classified into temporary hardness and permanent hardness.

Temporary hardness:

It is due to the presence of bicarbonates of Ca and Mg. These, on boiling decompose and precipitate as their carbonates which can be removed by decantation or filtration.

$Ca(HCO_3)_2$ --> $CaCO_3 + H_2O + CO_2$

(Calcium carbonate is the 'milkiness' that forms when lime water is reacted with carbon dioxide.)

$CaCO_3(s) + CO_2(g) + H_2O(l) \rightarrow Ca(HCO_3)_2(aq)$ (calcium hydrogen carbonate)

This reaction also occurs when rain water (containing dissolved carbon dioxide) flows over limestone rocks. On boiling, the reaction is reversed, softening the water.

Permanent hardness:

It is non-carbonate hardness and is caused due to the presence of sulphates, chlorides and nitrates of calcium and magnesium.

The hardness of water is significant in determining the suitability of water for domestic and industrial uses. The comparative amount of calcium and magnesium hardness, carbonates and non-carbonates hardness present in water are the aspects while determining the most economical type of softening process. When hard water is heated, Ca^{2+} ions react with bicarbonate (HCO_3^-) ions to form insoluble calcium carbonate ($CaCO_3$) This precipitate, known as scale, coats the vessels in which the water is heated, producing the mineral deposits on your cooking dishes. Equation below presents magnesium hardness.

$Mg^{2+}(aq) + 2OH^-(aq) \rightarrow MgOH_2(s)$

Carbonate hardness(mg/L)=Alkalinity:

When alkalinity > Total hardness: Carbonate hardness (mg/L) = Total hardness. The amount of hardness in excess of this is called “Non-carbonate hardness (NCH)”. These are associated with sulphate chloride, and nitrate ions.NCH (mg/L) = Total hardness - Carbonate hardness

History

Sources:

The principal natural sources of hardness in water are dissolved polyvalent metallic ions from sedimentary rocks, seepage and runoff from soils. Small water supplies using groundwater often encounter significant levels of hardness, but some larger surface water supplies also have the same issue. Calcium concentrations up to and exceeding 100 mg/l are common in natural sources of water, particularly groundwater. Magnesium is present in natural groundwater usually at lower concentrations (from negligible to about 50 mg/l and rarely above 100 mg/l), so calcium-based hardness usually predominates.

Effects :

1.Drinking water:

A large number of studies have investigated the potential beneficial health effects of drinking-water hardness. Most of these have been ecological epidemiological studies and have reported an inverse relationship between water hardness and cardiovascular mortality. Inherent weaknesses in the ecological epidemiological study design limit the conclusions that can be drawn from these studies.

2.Bathing water:

Exposure to hard water has been suggested to be a risk factor that could exacerbate eczema. A suggested explanation relative to hard water is that increased soap usage in hard water results in metal or soap salt residues on the skin (or on clothes) that are not easily rinsed off and that lead to contact irritation.

3. Corrosion and Scaling:

Combined with pH and alkalinity, scale deposition in the water distribution system, as well as in heated water applications can occur. Corrosion can be associated with health risks (from chelates such as lead, copper and other metals) and reduced lifespan of the distribution network and appliances (e.g. water heaters) using water. Soft or softened waters do have the benefit of minimal scaling and therefore allow moreefficient heat transfer in exchangers and probably longer life of hot water heaters.

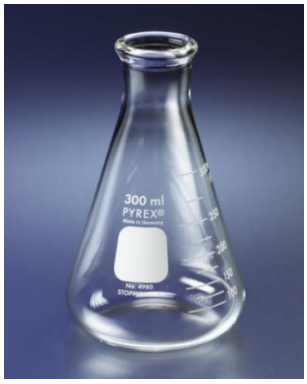
EXPERIMENTAL PROCEDURE

Apparatus:

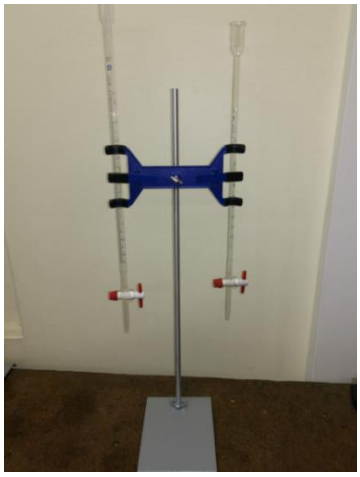
1. Beakers

2. Volumetric flasks

3. Conical flasks



4. Burette



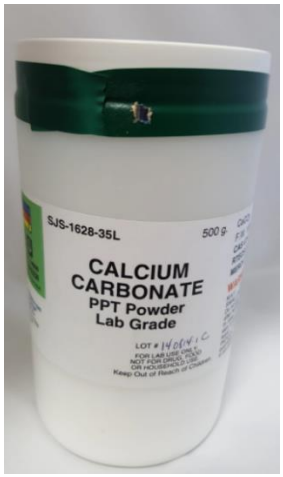
5. Pipette

6. Dropper

7. Glass rods

<u>Chemicals</u>

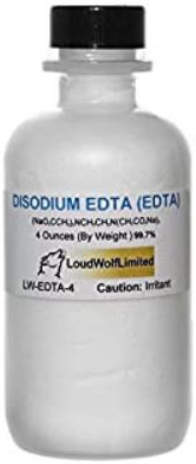
1. Pure, dried $CaCO_3$



2. Distilled water

3. Hydrochloric acid

4. Reagent grade Disodium EDTA



5. Sodium hydroxide pellets

6. Magnesium chloride hexahydrate

7. Eriochrome Black T indicator solution

In this experiment, an EDTA solution is prepared and standardized with standard calcium solution. The standardized EDTA is then used to analyze an unknown sample.

Standard Calcium Solution:

Accurately weigh 0.5 g of dried, pure CaCO3 into a 250 mL beaker. Add approximately 25 mL of distilled H2O, then add 1 mL of conc. HCl carefully, cover with watchglass spaced with glass hooks until dissolved. Note: If CaCO3 does not dissolve completely, add another 0.5 mL of conc. HCl. Next, evaporate volume to about 2 mL maintaining watchglass on beaker to expel carbon dioxide. Rinse watchglass, transfer quantitatively into a 500 mL volumetric flask and make up volumetrically to 500 mL. Calculate the molarity of your standard calcium solution.

EDTA Solution Preparation:

Weigh out approximately 2 g of reagent grade disodium EDTA into a 250 mL beaker. Add 0.05 g magnesium chloride hexahydrate, three pellets of NaOH and add about 200 mL of distilled water to dissolve. The EDTA will dissolve slowly over a period of a half an hour. Magnesium chloride is added to enhance the sharpness of the endpoint (It forms a more stable complex with the indicator). Filter the EDTA solution into a 0.5 or 1 L bottle, then add approximately 250 mL of distilled water.

Titration Procedure:

Standardization Titration for EDTA:

Fill your burette with the EDTA solution. Pipet three 25 mL aliquots of standard calcium solution into 250 mL Erlenmeyer flasks, add 3 mL ammonium chloride buffer (pH 10) and 2-3 drops of Eriochrome Black T indicator solution. Titrate with EDTA from violet through wine-red to blue. It is recommended to experiment with a 5 mL aliquot to get an idea of the color and titre. The indicator color changes slowly, thus, the titrant must be added slowly near the endpoint with thorough stirring. Calculate the molarity of the EDTA. Now you have your EDTA solution standardized and your standard EDTA solution should be ~0.01 M.

Titration of Unknown Calcium Sample:

Prepare a clean beaker and take 100 mL of unknown solution. Titrate with standard EDTA, 25 mL of unknown solution after addition of 3 mL ammonium chloride buffer (pH 10) and 2-3 drops of Eriochrome Black T indicator solution following the procedure above. Repeat this for the three samples. Express the concentration of calcium carbonate in the unknown sample in ppm.

Result:

Total hardness of water at various places in and around Hanamkonda

S. No.	Water Source	Total Hardness
1	Distilled water	0 ppm
2	Balasamudram	595 pm
3	Prashanth Nagar	650 ppm
4	Advocates Colony	750 ppm
5	Hasanparthy	665 ppm
6	Vidyaranya puri	710 ppm
7	Gopalpur	725 ppm
8	Water plant	105 ppm
9	Bottled water	20 ppm
10	Municipal tap water	120ppm
11	Agricultural bore water	817ppm

The BIS (Bureau of Indian Standards) Guidelines value [maximum allowable] for Hardness of drinking water is 600mg/L.

Conclusion:
Thus, from the above experiment we learn that the samples 1,2 and 3 had allowable levels of hardness for drinking water while there are many other parameters to be met for them to be deemed potable on a whole.

The degree of hardness of drinking-water is important for aesthetic acceptability by consumers and for economic and operational considerations. Many hard waters are softened for those reasons using several applicable technologies, and the mineral composition will be significantly affected.
One approach is to ensure that the water used for drinking and cooking is not demineralized and to soften only the hot water line at the entry to the hot water heater, which provides several benefits and also reduces costs.

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Student Study project on

Amount of Caffeine in Tea samples

BY

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NOVEMBER, 2021

DEPARTMENT OF CHEMISTRY

KAKATIYA GOVERNMENT COLLEGE, HANAMKONDA

Date: 17.11.2021

CERTIFICATE

This is to certify that the project report entitled a study project on "**Amount of Caffeine in Tea samples**" submitted to head department of chemistry Kakatiya Government College, Hanamkonda. It was carried out by the following students J.Roopini, P.Devaharshini L.Anji, S.Udaya Krishna, M.Sai Lalith, T.Rajanarsimha, M.Vijay, T.Sridevi, P.Neha ,L.Mukesh under my guidance.

Signature of head department

Signature of the guide

[Dr.R.Mogili]

Asst. Prof. of Chemistry

Introduction:

Aim is To Determine Caffeine In Tea Samples . Tea is the most commonly and widely used soft beverage in the household. It acts as a stimulant for central nervous system and skeletal muscles. That is why tea removes fatigue, tiredness and headache. It also increases the capacity of thinking. It is also used for lowering body temperature.

The principal constituent of tea, which is responsible for all these properties, is the alkaloid-caffeine. The amount of caffeine in tea leavers varies from sample to sample. Originally it was thought that caffeine is responsible for the taste and flavour of tea. But pure caffeine has been found to be a tasteless while substance. Therefore, the taste and flavour of tea is due to some other substance present in it. There is a little doubt that the popularity of the xanthenes beverages depends on their stimulant action, although most people are unaware of any stimulation. The degree to which an individual is stimulated by given amount of caffeine varies from individual to individual.

For example, some people boast their ability to drink several cups of coffee in evening and yet sleep like a long, on the other hand there are people who are so sensitive to caffeine that even a single cup of coffee will cause a response boarding on the toxic. The xanthene beverages also create a medical problem. They are dietary of a stimulant of the CNS. Often the physicians face the question whether to deny caffeine containing beverages to patients or not. In fact children are more susceptible than adults to excitation by xanthenes. For this reason, tea and coffee should be excluded from their diet. Even cocoa is of determination of Caffeine in Tea Samples Ankit

Bahuguna (XII-A) doubtful value. It has a high tannin content may be as high as 50 mg per cup. After all our main stress is on the presence of caffeine in xanthene beverages and so in this project we will study and observe the quantity of caffeine varying in different samples of tea leaves..

Uses of Caffeine:

1.In medicine, it is used to stimulate, central nervous system and to increase flow of urine.

2.Because of its stimulating effects, caffeine has been used to relieve fatigue. But it is dangerous and one may collapse if not consumes it under certain limit.

3. Caffeine is also used in analgesic tablets, as it is believed to be a pain reliever. It is also beneficial in migraines.

Effects of Caffeine:-

1.It is psycho - stimulant.

2.It improves physical and mental ability.

3.Its effect in learning is doubtful but intellectual performance may improve where it has been used to reduce fatigue or boredom.

4.When administered internally, it stimulates heart and nervous system and also acts as diuretic. On the contrary their excessive use is harmful to digestion and their long use leads to mental retardation .

Procedure:

First of all, 50 grams of tea leaves were taken as sample and 150 ml of water was added to it in a beaker.

Then the beaker was heated up to extreme boiling.

The solution was filtered and lead acetate was added to the filtrate, leading to the formation of a curdy brown coloured precipitate.

We kept on adding lead acetate till no more precipitate has been formed.

Again solution was filtered.

Now the filtrate so obtained was heated until it had become 50 ml.

Then the solution left was allowed to cool.

After that, 20 ml. of chloroform was added to it.

Soon after, two layers appeared in the separating funnel.

The residue left behind was caffeine.

Then we weighed it and recorded the observations.

Similar procedure was performed with different samples of tealeaves and quantity of caffeine was observed in them.

Observation Table

1. Red Label Tea (Brooke Bond)

Weight of china dish	46.60 gms
Weight of china dish with precipitate	47.20gms
Amonut of Caffeine	0.60gms

2.Yellow Label Tea (Lipton)

Weight of china dish	46.60 gms
Weight of china dish with precipitate	47.15gms
Amonut of Caffeine	0.55gms

3.Green Label Tea (Lipton)

Weight of china dish	46.60 gms
Weight of china dish with precipitate	47.05gms
Amount of Caffeine	0.45gms

Conclusion

1. Quantity of caffeine in Red label tea is 60mg. /sample of 50 gm.

2. Quantity of caffeine in yellow label tea is 55mg./sample of 50 gm.

3. Quantity of caffeine in green label tea is 45mg./sample of 50 gm..

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KAKATIYA GOVERNMENT COLLEGE
HANAMKONDA

STUDENTS' STUDY PROJECT

on

The Ions present in the Tooth Paste and Determine the Quality

Supervised

By

ASHOK ALISHALA

DEPARTMENT OF CHEMISTRTY

NOVEMBER-2021

CERTIFICATE

This is to certify that the project report entitled **"The Ions present in the Tooth Paste and Determine the Quality"** submitted to the Department of Chemistry, Kakatiya Government College, Hanamkonda and it was carried out by the following students under my guidance.

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2. Mekala Deevena III Year BZC
3. Mekala Ramya III Year BZC
4. MD. Ajaz III Year BZC
5. MD. Musthan Baba III Year BZC
6. M. Promod III Year BZC
7. M. Rahul III Year BZC
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9. N. Srinu III Year BZC
10. N. Manikanta III Year BZC
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12. Munavath Swathi III Year BZC
13. Orsu Mamatha III Year BZC
14. P. Devi Prasad III Year BZC
15. P. Rakesh III Year BZC

Supervisor Incharge Principal

(Ashok Alishala)

THE IONS PRESENT IN THE TOOTHPASTE

AND DETERMINE THE QUALITY

Abstract:

To Check The Ions Present In The Toothpaste And Determine The Quality.

Theory:

Every tooth paste contains the following ingredients: binders, abrasives, sobers, humectants, flavors, sweeteners, fluorides, tooth whiteners, a preservative and water. Binders thicken toothpaste- they prevent separation of the solid and liquid component, especially storage. They also affect the speed and volume of foam production, rate of flavor release and product dispersal, the appearance of toothpaste ribbon on the tooth brush. Some binders are gum solid alginate, methyl cellulose, carrageen and magnesium aluminium silicate.

Colour of the Paste - White

EXPERIMENT	OBSERVATIONS	INFERENCE
Take a part of the solution and add MgSO4 solution	Formation of white ppt	CO_3^{-2} is confirmed
Take a part of the solution and add ammonium hydroxide (1-2mL)	Formation of white ppt	Ca^{+2} confirmed
Take a part of solution and add magnesium mixture(Mixture NH_4Cl and NH_4OH)	Formation of white ppt	PO_4^{-3} is confirmed
Acidify a portion of aqueous solution with dilute HNO3. Boil and cool and add $AgNO_3$	A yellow ppt. is formed which is insoluble in NH4OH	I^{-1} is confirmed
Take a small quantity of solution and add oxalic acid	Smells not like that of vinegar	$CH3COO^{-1}$ is absent
To one part of the solution add	No reaction	Pb is absent
Take one part of the solution and add solid NH_4Cl add NH_4OH in slight excess and then add ammonium phosphate	A white ppt is formed	Mg is present

Chemical Reactions

1. $CO_3^{-2} + MgSO_4 \rightarrow MgCO_3 + SO_4^{-2}$ (white ppt.)

2. $CO_3^{-2} + 2CH_3COOH \rightarrow (CH3COO)_2Ca + H_2O$
$(CH3COO)_2Ca + (NH_4)_2C_2O_4 \rightarrow 2CHCOONH_4 + CaC_2O_4$

3. $NaHPO_4 + MgCl_2 + NH_4OH \rightarrow Mg(NH_4)PO_4 + 2NaCl + H_2O$

4. I^{-1}+ $AgNO_3$ →NO_3^{-1}+AgI (yellow ppt.)

5. $(COOH)_2$ + $2CH_3COONa$ → NO REACTION

6. Pb + 2KI→ NO REACTION

7. $MgCl_2$ + NH_4OH+ $(NH_4)_2HPO_4$ → $Mg(NH_4)PO_4$ + $2NH_4$ +H_2O

Test on Colgate

Colour of Paste- White

EXPERIMENT	OBSERVATIONS	INFERENCE
Take a part of the solution and add MgSO4 solution	Formation of white ppt	CO_3^{-2} is confirmed
Take a part of the solution and add ammonium hydroxide (1-2mL)	Formation of white ppt	Ca^{+2} confirmed
Take a part of solution and add magnesium mixture(Mixture NH_4Cl and NH_4OH)	Formation of white ppt	PO_4^{-3} is confirmed
Acidify a portion of aqueous solution with dilute HNO3. Boil and cool and add $AgNO_3$	A yellow ppt. is formed which is insoluble in NH4OH	I^{-1} is confirmed
Take a small quantity of solution and add oxalic acid	Smells not like that of vinegar	CH_3COOH is is absent
To one part of the solution add KI	No reaction	Pb is absent
Take one part of the solution and add solid NH4Cl add NH4OH in slight excess and then add ammonium phosphate	A white ppt is formed	Mg is present

IONS PRESENT:- Mg, I^{-1}, PO_4^{-3}, Ca, CO_3^{-2}

Chemical Reactions

1. CO_3^{-2} +$MgSO_4$ → $MgCO_3$ + SO_4^{-2}
(white ppt.)

2. CO_3^{-2} + $2CH_3COOH$ → $(CH_3COO)_2Ca$ + H_2O
(CH3COO)2Ca + (NH4)2C2O4 → $2CHCOONH_4$ +CaC_2O_4

3. NaHPO4 + $MgCl_2$+ NH_4OH → $Mg(NH_4)PO_4$ + 2NaCl + H_2O

4. I^{-1}+ $AgNO_3$ →NO_3^{-1}+AgI (yellow ppt.)

5. $(COOH)_2$ + $2CH_3COONa$ → NO REACTION

6. Pb + 2KI→ NO REACTION

7. MgCl2 + NH_4OH+ $(NH_4)_2HPO_4$ → $Mg(NH_4)PO_4$ + $2NH_4^{+1}$ +H_2O

Test on Close Up

Colour of the Paste- Red Gel

EXPERIMENT	OBSERVATIONS	INFERENCE
Take a part of the solution and add MgSO4 solution	Formation of white ppt	CO_3^{-2} is confirmed
Take a part of the solution and add ammonium hydroxide (1-2mL)	Formation of white ppt	Ca+2 confirmed
Take a part of solution and add magnesium mixture(Mixture NH4Cl and NH4OH)	Formation of white ppt	PO_4^{-3} is confirmed
Acidify a portion of aqueous solution with dilute HNO3. Boil and cool and add AgNO3	A yellow ppt. is formed which is insoluble in NH4OH	I^{-1} is confirmed
Take a small quantity of solution and add oxalic acid	Smells not like that of vinegar	$CH3COO^{-1}$ is absent
To one part of the solution add KI	No reaction	Pb is absent
Take one part of the solution and add solid NH4Cl add NH4OH in slight excess and then add ammonium phosphate	A white ppt is formed	Mg is present

IONS PRESENT:- Mg, I, PO4, Ca, CO3, CH3COO

Chemical Reactions

1. $CO_3^{-2} + MgSO_4 \rightarrow MgCO_3 + SO_4^{-2}$
(white ppt.)

2. $CO_3^{-2} + 2CH_3COOH \rightarrow (CH_3COO)_2Ca + H_2O$
$(CH3COO)2Ca + (NH4)2C2O4 \rightarrow 2CHCOONH_4 + CaC_2O_4$

3. $NaHPO4 + MgCl_2 + NH_4OH \rightarrow Mg(NH_4)PO_4 + 2NaCl + H_2O$

4. $I^{-1} + AgNO_3 \rightarrow NO_3^{-1} + AgI$ (yellow ppt.)

5. $(COOH)_2 + 2CH_3COONa \rightarrow$ NO REACTION

6. $Pb + 2KI \rightarrow$ NO REACTION

7. $MgCl_2 + NH_4OH + (NH_4)_2HPO_4 \rightarrow Mg(NH_4)PO_4 + 2NH_4^{+1} + H_2O$

Conclusion:

Hence after testing different samples of toothpaste, we find that colgate has all necessary for stronger and whiter teeth

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GOVERNMENT OF TELANGANA

JIGNASA - STUDENT STUDY PROJECT

Perception of Patients about Generic Drugs - a Case Study in Warangal

By

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Date: 6.12.2021

CERTIFICATE

Certified that the work embodied in this study project entitled ” Perception of patients bout Generic drugs-A case study in warangal” has been carried out by K. Pranay, K. thirupathi,K.Sreedhar,K.Anusha,K.Yogi,K.Ravali,K.Pavan,K.PriyasreeK.Saikumar,K.Muthyam, K.Sandhya Rani, L.Suresh, L.Murali, M.Latha and M.Pravalika under the supervision of Dr.B.Ramesh in the Department of Chemistry, Kakatiya Government College, Hanumakonda.

Objectives: Cost of the medicines is a concern for the patients. Within India cost of medicines varies, the basic reason behind this is the brand price quoted by the pharmaceutical industries. Survey was undertaken to review and analyse various facts about branded and generic medicines of the same drugs.

About Generic Drugs: they usually cost much less than the brand-name version The FDA requires generic drugs to meet a number of standardsTrusted Source before approval. These include:

- The generic drug is “pharmaceutically equivalent” to the brand drug.
- The manufacturer can produce the generic drug both correctly and consistently.
- The generic drug has the same “active ingredient” as the brand drug.
- The correct amount of the active ingredient gets to the target area in the body.
- The ”inactive ingredients” in the generic drug are safe.
- The generic drug’s bottle, box, or other container is suitable.
- The generic drug’s label is the same as the brand drug’s label.
- The generic drug does not deteriorate over time.
- The legal exclusivities or patents have expired.

Method: By survey of Generic Stores price list and other resources by the authors it is found that there is a vast difference between prices of branded and generic medicines. Further survey was conducted for following target groups and individuals. The groups are Literate population (science background), Common public (educated but non science background) and Practicing Pharmacists. The different sets of questionnaire were prepared for each group and survey was conducted. The questions were designed as to check awareness, knowledge and preference of medication.

Perception of Patients about Generic Drugs-a Case Study in Warangal

Questionaire

---

1. Do you ever heard about generic medicine?
2. Do you understand the difference between GENERIC and BRANDED medicine?
3. Do you know that there is price difference between GENERIC and BRANDED medicine?
4. If yes, then which is cheaper Generic?
5. Would you prefer buying Generic medicines over Branded medicines?
6. Have you ever asked your doctor to prescribe Generic medicines?
7. Have you ever asked the chemist to give you Generic medicines in place of Branded medicines?
8. In case of NO, why it happened so?
9. Do you think there is a difference in the quality of Generic medicine as compared to Branded variant? If Yes,
   a. Generic medicines have better quality than Branded
   b. Generic medicines have lower quality than Branded medicines
   c. Generic medicines have similar qualities as Branded
10. Do you think there is a difference in the price of Generic and Branded medicines? If yes,
    a. Generic medicines have higher price than Branded medicines
    b. Generic medicines have lower price than Branded medicines
    c. Generic medicines have the same price as that of Branded medicines
11. Which type of medicines do doctors prefer to prescribe you?
    a. Generic
    b. Branded
    c. Don't know
12. Are you aware of any government rules regarding Generic or Branded medicines?
13. Which type of medicines does Indian Government promote?
14. Which type of medicine name must be written on the patient prescription as per the Government Rules?
    a. Generic
    b. Branded
    c. Both
15. Which type of the medicines whether generic or branded, do you consider should be promoted?

Results: The highlighting results of this survey based project are that more number of consumers want economic alternative to the brand medicines which includes persons with or without science background, a remarkable number of consumers does not have knowledge about generic medicines, most of the physicians do not prefer generic medicines and most of the practicing pharmacists have very less business through generic medicines.

Conclusion: Even if generic medicines are going to be made available free of cost at the government hospitals the war of prices between branded and generic may not stop. More stringent rules and regulation are required for making the drugs available at reasonable cost for the masses. For the benefit of the patients, if pharmacist needs to change a brand for generic medicine, should be permitted by law.


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JIGNASA - STUDENT STUDY PROJECT (2021-22)

Synthesis, spectral characterization of mononuclear copper (II) complexes

By

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CERTIFICATE

Certified that the work embodied in this study project entitled "**Synthesis Synthesis, spectral characterization of mononuclear copper (II) complexes**" and antim and anti microbial studies with2-(E)-(5-cyclohexylmethoxy phenylimino)phenol has been carried out by G.Rajkumar, G.Muralidher, G.Venkateswarlu,G.Rajesh, G. Navaneetha ,G.Premsagar, G.Shireesha, J.Rajeswar and K.Vyshnavi under the supervision of K. Jagadesh Babu and in the Department of Chemistry, Kakatiya Government College, Hanumakonda.

PRINCIPAL

Synthesis, spectral characterization of mononuclear copper (II) complexes and antim and anti microbial studies with2-(E)-(5-cyclohexylmethoxy phenylimino)phenol

Introduction

The interaction of small molecules, especially metal complexes, with biomolecules such as nucleic acid and proteins, due to their application in drug design has become prominent area of interest. Cancer is a major public health issue in many parts of the world. If recent global trends in the occurrence of cancer and population growth continue in the future, it is expected that there will be 23.6 million reports of new cancer diagnoses worldwide each year by 2030 [1]. Similarly the metal complexes have their own characteristic geometrical designs. In general, the metal complexes of Schiff bases play a key role in understanding the coordination chemistry of transition metals. Particularly, the imine (–C=N–) group of Schiff base provides an opportunity for the splendid biological activities such as antimicrobial, antitumor and herbicidal activities[4-10]. The above facts and features help us to focus on designing a series of biologically active metal complexes such as, copper complex derived from 2-((E)-(5-cyclohexyl-2-methoxyphenylimino) phenol in the present investigation.

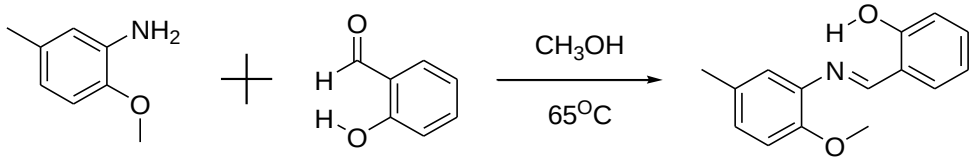
Materials and Instrumentation

All the starting materials (aldehyde and amine) and solvents such as methanol, petroleum ether, acetone and chloroform were purchased from Sigma-Aldrich Chemical Pvt. Ltd., with high purity and were used directly., FT-IR spectra were recorded in the range 4000-400 cm^{-1} on Shimadzu IR Prestige-21 using KBr pellets. NMR spectra of the Schiff bases were recorded on Bruker 400 MHz NMR instrument using TMS as internal reference.

Synthesis of Schiff base ligand(L1)

The hot methanolic solution of amine(1mM) with salicylaldehide(1mM) were refluxed about 24 hours at 68^{o}C with continuous magnetic stirring. The extent of the reaction was monitored by TLC. Which has shown single spot in petroleum ether and ethyl acetate (7:3) mixture. The dark yellow orange coloured schiffbases formed was filtered off, thoroughly

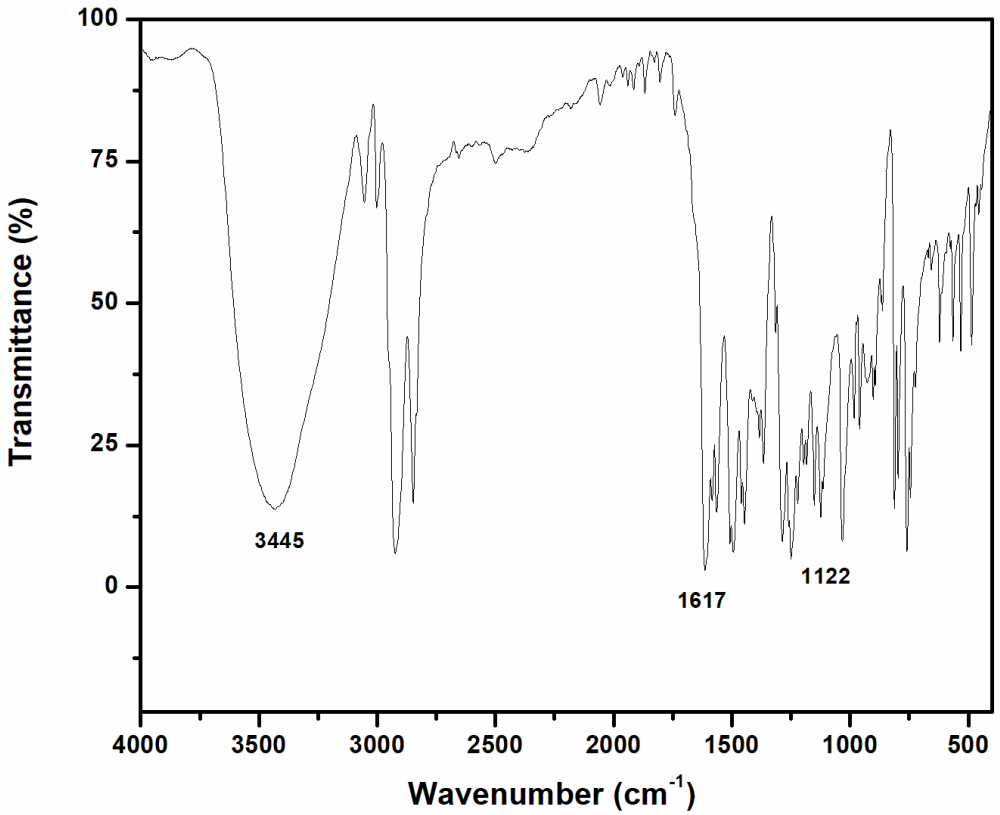
washed with cold methanol and petroleum ether, then recrystalized from methanol. The synthetic procedure of Schiff base were shown in **Scheme1.**

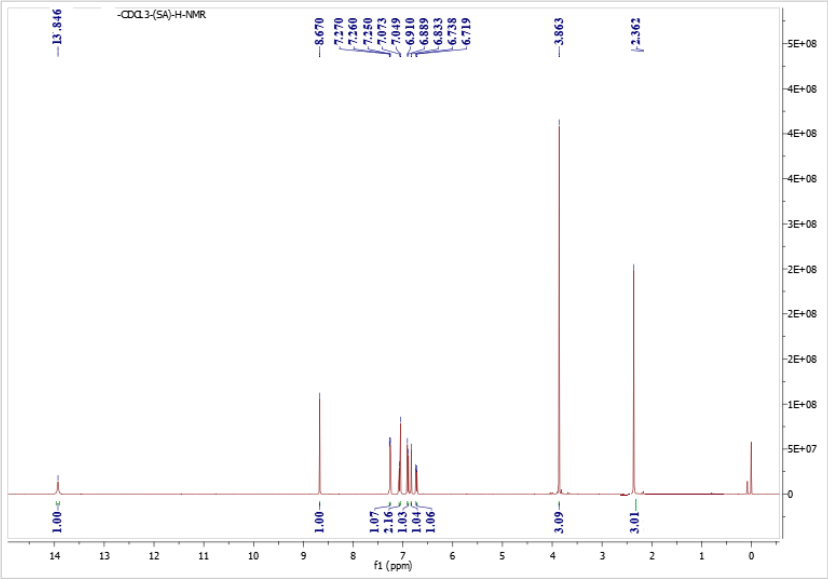


2-((E)-(5-cyclohexyl-2-methoxyphenylimino)phenol,

(C15H15NO2), (L1):Yield: 70 %.IR (KBr): $\nu_{(O-H)}$3445, $\nu_{(CH=N)}$ 1617, $\nu_{(C-O)}$1122 (Fig. 1).UV-Vis; λ_{max}/nm (cm^{-1}): 260(38461), 343 (29154), 438 (22831) (Fig. 2).^{1}H-NMR (400MHz, $CDCl_3$) (δ):13.97 (s, 1H); 8.71 (s, 1H); 7.39-6.88 (Ar,7H); 2.35 (3H); . 3).ESI-MS (m/z):241 $[M+H]^+$(Fig. 4).MP: 89ºC.

Fig. 1.FT-IR spectrum of ligand HL[1]

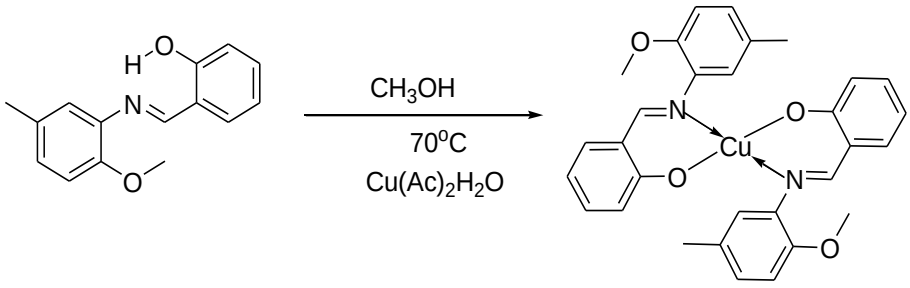




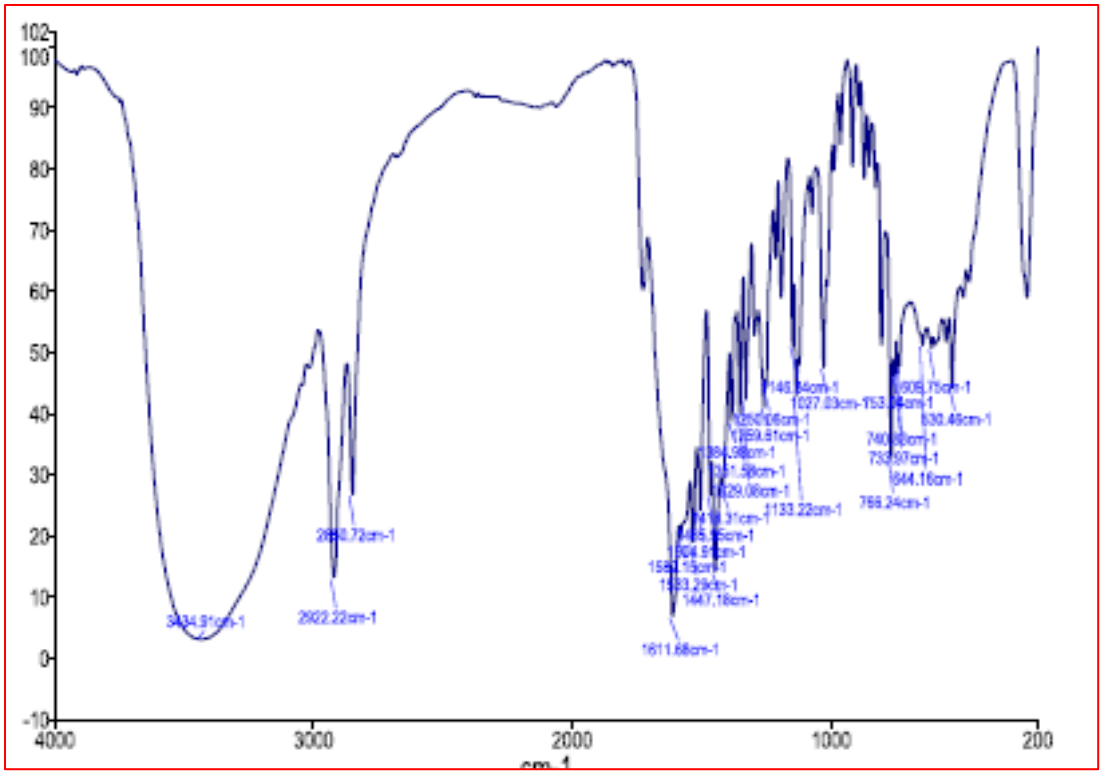
Synthesis of binary metal complex

A hot methanolic solution (10 mM) of copper acetate monohydrate [$Cu(CH_3COO)_2.H_2O$]was added drop wise to a stirred hot methanolic solution of Schiff base ligand **HL^1**(20mM) taken in 1:2 molar ratio. After addition, the solution turned into colour. After that, the reaction mixture was refluxed with stirring at 70 ^oC for 4-5 h. The obtained solid product was isolated, filtered and washed with petroleum ether and methanol finally recrystalized in hot methanolic solution. The synthetic procedure of Schiff base ligand and itsbinary metal complex was shown in

Scheme2.



[Cu(L^1)$_2$] ($C_{30}H_{28}CuN_2O_4$): Yield: 70 %. IR (KBr): $\nu_{(CH=N)}$ 1616, $\nu_{(C-O)}$ 1116, $\nu_{(M-O)}$ 530, $\nu_{(M-N)}$ 450(Fig.5).UV-Vis(DMSO)λ_{max}/nm(cm^-



Results and discussion

Schiff base and its metal complex are coloured, highly stable at room temperature and non-hygroscopic. Both, ligand and its complexare soluble in organic solvents like methanol, ethanol and chloroform etc.,while insoluble in water. The analytical data of synthesized complex is in good agreement with the calculated stoichiometric ratios of metal to ligand (1:2).

FT-IR spectra

The coordination mode of the ligand towards the metal centers has been explored by the comparison of an infrared spectrum of the free ligand with corresponding metal complex, shown that The ligand **HL^{1}**showed a characteristic strong band at 1613, due to the azomethine group of Schiff base, this band is shifted in complex to a lower wave number indicating that the coordination occurred through the azomethine nitrogen atom of Schiff bases[11].A band at 3445 cm^{-1} due to phenolic –OH group of Schiff base is not found in complex, indicating the coordination to central metal ion by deprotonation. In addition, the two non-ligand bands appeared in the complexdue to ν(M–O) and ν(M–N) bands further supported the coordination occurred through the phenolic oxygen and azomethine nitrogen atoms, respectively.

Antimicrobial activity

The antimicrobial activity of the ligand and its metal complexare evaluated by paper disc technique using nutrient agar as the medium [12, 13] and results are presented in **Table 1.**From the results, the ligand either exhibited no activity or having low to moderate activity against bacterial and fungal strains. But its metal complex showed moderate to good activity compared to the standard antibiotics. In evaluation, the activity of all the strains in the presence of ligandis increased when coordinated with metal(II) ion. **Table 1.**Zone of inhibition (mm) of the Schiff base and its metal complex and free metal salt 500 go/mol concentration.

Compound	Gram positive	Gram negetive	Fungi (mm)
	s.titilis	*e.coli*	*a.niger*
HL[1]	6	5	7.9
1a	7	9	9.5

Conclusion

Schiff base ligand and itsmetal(II) complex were synthesized and physicochemically characterized by means of spectroscopic measurements. The analytical and spectral data concluded that the copper complex owned a square planar geometry with 1:2 (metal:ligand) stoichiometry. In addition, the antimicrobial activity results showed that the complex exhibited higher antimicrobial activity than the corresponding Schiff base but some what lower activity than the standard antibiotics. These investigations will be useful in developing the new metal based drugs for the treatment of bacterial infections.

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