TECHNOCRATS

Lab Work Book of

Pharmaceutical Inorganic Chemistry

(BP -110 P)

Department of Pharmacy

Lab Manual of

Pharmaceutical Inorganic Chemistry

(BP - 110 P)

Price : ₹ ...../-

Edition :

Printed & Published by :

TECHNOCRATS PUBLICATIONS

Arera Colony, Bhopal.
e-mail : technocratspublications@gmail.com

TECHNOCRATS
PUBLICATIONS

Lab Work Book
of

Pharmaceutical Inorganic Chemistry

(BP - 110 P)

(Strictly According to RGPV Syllabus)

Name : .....

Enrollment No. : .....

Institute : .....

Academic Session : .....

Department of Pharmacy

TECHNOCRATS
PUBLICATIONS

Vision of the Institute

To grow as an institute of Excellence for Pharmacy Education and Research and to serve the humanity by sowing the seeds of intellectual, cultural, ethical, and humane sensitivities in the students to develop a scientific temper, and to promote professional and technological expertise.

Mission of the Institute

M 1: To inculcate ethical, moral, cultural and professional values in students

M 2: To provide state of art infrastructure facilities to the staff and students so as to enable them to learn latest technological advancements

M 3: State of art learning of professionalism by the faculty and students

M 4: To produce well learned, devoted and proficient pharmacists

M 5: To make the students competent to meet the professional challenges of future

M 6: To develop entrepreneurship qualities and abilities in the students

PROGRAM OUTCOMES (POs)

1. **Pharmacy Knowledge:** Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy, including biomedical sciences; pharmaceutical sciences; behavioral, social, and administrative pharmacy sciences; and manufacturing practices.
2. **Planning Abilities:** Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines.
3. **Problem analysis:** Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems and making decisions during daily practice. Find, analyze, evaluate and apply information systematically and shall make defensible decisions.
4. **Modern tool usage:** Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of thelimitations.
5. **Leadership skills:** Understand and consider the human reaction to change, motivationissues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and well- being.
6. **Professional Identity:** Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
7. **Pharmaceutical Ethics:** Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
8. **Communication:** Communicate effectively with the pharmacy community and with society at large, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.
9. **The Pharmacist and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.
10. **Environment and sustainability:** Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
11. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. Self-assess and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis.

PEOs

PEO 1: To inculcate quality pharmacy education and training through innovative Teaching Learning Process.

PEO 2: To promote professionalism, team spirit, social and ethical commitment with effective interpersonal communication skills to boost leadership role assisting improvement in healthcare sector.

PEO 3: To enhance Industry-Institute-Interaction for industry oriented education and research, which will overcome healthcare problems of the society.

PEO 4: To adapt and implement best practices in the profession by enrichment of knowledge and skills in research and critical thinking

PEO 5: To generate potential knowledge pools with interpersonal and collaborative skills to identify, assess and formulate problems and execute the solution in closely related pharmaceutical industries and to nurture striving desire in students for higher education and career growth.

Course Outcomes (COs):

Student will be able to:

- CO1: Perform Limit test for the various Inorganic compounds as per the procedure given in Indian pharmacopoeia.
- CO2: Calibrate weights, pipette and burette.
- CO3: Perform assay various inorganic compounds with the help of titrations.
- CO4: Identify different inorganic compounds.
- CO5: Prepare and purify different inorganic compounds.

Index

Experiment No. 1

OBJECT:

To perform Limit test for Chloride.

REFERENCE:

1. Belsare D.P., Dhake A.S., Inorganic Pharmaceutical Chemistry, Second edition-2008, Career Publications Nashik, Page no- 75-76.
2. Chatwal G.R., Pharmaceutical Chemistry Inorganic, Fifth edition- 2008, Himalaya Publishing House Pvt. Ltd. Mumbai, Page no- 47-48.

APPARATUS AND CHEMICAL REQUIREMENT:

Sodium Chloride, Silver Nitrate, Dil. Nitric Acid, Nessler Cylinder, Beaker, Glass Rod

THEORY:

Limit test is defined as quantitative or semi quantitative *test* designed to identify and control small quantities of impurity which is likely to be present in the substance.

Limit test of chloride is based on the reaction of soluble chloride with silver nitrate in presence of dilute nitric acid to form silver chloride, which appears as solid particles (Opalescence) in the solution.

$$NaCl + AgNO_3 \xrightarrow{HNO_3} AgCl + NaNO_3$$

PROCEDURE:

Test solution	Standard solution
Specific weight of compound is dissolved in water or solution is prepared as directed in the pharmacopoeia and transferred in Nessler cylinder	Take 1ml of 0.05845 % W/V solution of sodium chloride in Nessler cylinder
Add 1ml of nitric acid	Add 1ml of nitric acid
Dilute to 50ml in Nessler cylinder	Dilute to 50ml in Nessler cylinder
Add 1ml of $AgNO_3$ solution	Add 1ml of $AgNO_3$ solution
Keep aside for 5 min	Keep aside for 5 min
Observe the Opalescence/Turbidity	Observe the Opalescence/Turbidity

OBSERVATION:

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RESULT AND DISCUSSION:

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VIVA QUESTIONS

Q.1 What is Limit test?

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Q.2 What is Nessler cylinder?

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Q.3 What is the use of Dil. Nitric Acid in Limit test for Chloride?

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Q.4 Which compound forms precipitate in Limit test of Chloride?

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Experiment No. 2

OBJECT:

To perform Limit test for Sulphate.

REFERENCE:

1. Belsare D.P., Dhake A.S., Inorganic Pharmaceutical Chemistry, Second edition-2008, Career Publications Nashik, Page no- 77-78.
2. Chatwal G.R., Pharmaceutical Chemistry Inorganic, Fifth edition- 2008, Himalaya Publishing House Pvt. Ltd. Mumbai, Page no- 49-50.

APPARATUS AND CHEMICAL REQUIREMENT:

Barium Chloride, Dil. Hydrochloric Acid, Potassium Sulphate, Nessler Cylinder, Beaker, Glass Rod

THEORY:

Limit test is defined as quantitative or semi quantitative *test* designed to identify and control small quantities of impurity which is likely to be present in the substance.

Limit test of sulphate is based on the reaction of soluble sulphate with barium chloride in presence of dilute hydrochloric acid to form barium sulphate which appears as solid particles (turbidity) in the solution.

$$SO_4^{2} + BaCl_2 \xrightarrow{HCl} BaSO_4 + KCl$$

PROCEDURE:

Test Solution	Standard Solution
Specific weight of compound is dissolved in water or solution is prepared as directed in the pharmacopoeia and transferred in Nessler cylinder	Take 1ml of 0.1089 % W/V solution of potassium sulphate in Nessler cylinder
Add 2ml of dilute hydrochloric acid	Add 2ml of dilute hydrochloric acid
Dilute to 45 ml in Nessler cylinder	Dilute to 45 ml in Nessler cylinder
Add 5ml of barium sulphate reagent	Add 5ml of barium sulphate reagent
Keep aside for 5 min	Keep aside for 5 min
Observe the Turbidity	Observe the Turbidity

OBSERVATION:

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RESULT AND DISCUSSION:

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VIVA QUESTIONS

Q.1 What is Limit test?

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Q.2 What is Nessler cylinder?

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Q.3 What is the use of Dil. Hydrochloric Acid in Limit test for Sulphate?

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Q.4 Which compound forms precipitate in Limit test of Sulphate?

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Experiment No. 3

OBJECT:

To perform Limit test for Iron.

REFERENCE:

1. Belsare D.P., Dhake A.S., Inorganic Pharmaceutical Chemistry, Second edition-2008, Career Publications Nashik, Page no- 81-82..
2. Chatwal G.R., Pharmaceutical Chemistry Inorganic, Fifth edition- 2008, Himalaya Publishing House Pvt. Ltd. Mumbai, Page no- 51-52.

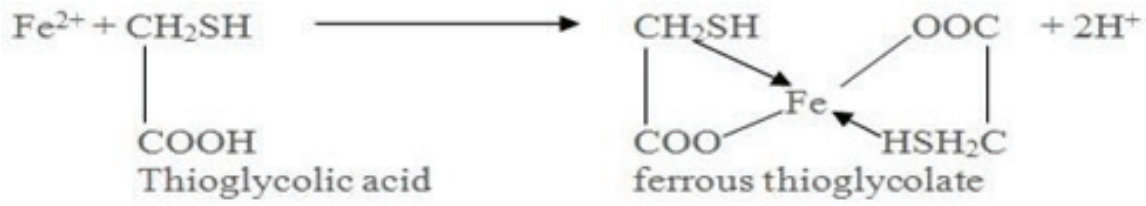
APPARATUS AND CHEMICAL REQUIREMENT:

Citric Acid, Thioglycolic Acid, Ammonia, Nessler Cylinder, Beaker, Glass Rod

THEORY:

Limit test is defined as quantitative or semi quantitative *test* designed to identify and control small quantities of impurity which is likely to be present in the substance.

Limit test of Iron is based on the reaction of iron in ammonical solution with thioglycollic acid in presence of citric acid to form iron thioglycolate which is pale pink to deep reddish purple in color.



PROCEDURE:

Test Solution	Standard Solution
Sample is dissolved in specific amount of water and then volume is made up to 40 ml	2 ml of standard solution of iron diluted with water upto 40ml
Add 2 ml of 20 % w/v of citric acid (iron free)	Add 2 ml of 20 % w/v of citric acid (iron free)
Add 2 drops of thioglycollic acid	Add 2 drops of thioglycollic acid
Add ammonia to make the solution alkaline and adjust the volume to 50 ml	Add ammonia to make the solution alkaline and adjust the volume to 50 ml
Keep aside for 5 min	Keep aside for 5 min
Color developed is viewed vertically and compared with standard solution	Color developed is viewed vertically and compared with standard solution

OBSERVATION:

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RESULT AND DISCUSSION:

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VIVA QUESTIONS

Q.1 What is Limit test?

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Q.2 What is Nessler cylinder?

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Q.3 Which compound forms precipitate in Limit test of Iron?

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Experiment No. 4

OBJECT:

To perform Limit test for Heavy Metals.

REFERENCE:

1. Belsare D.P., Dhake A.S., Inorganic Pharmaceutical Chemistry, Second edition-2008, Career Publications Nashik, Page no- 78-81.
2. Chatwal G.R., Pharmaceutical Chemistry Inorganic, Fifth edition- 2008, Himalaya Publishing House Pvt. Ltd. Mumbai, Page no- 52-54.

APPARATUS AND CHEMICAL REQUIREMENT:

Lead solution, Dil. Acetic Acid, Ammonia, Hydrogen Sulphide Solution, Sulphuric Acid, Nitric Acid, Hydrochloric Acid, Sodium Hydroxide, Sodium Sulphide Solution, Litmus Paper, Muffle Furnace, Nessler Cylinder, Beaker, Glass Rod

THEORY:

Limit test is defined as quantitative or semi quantitative *test* designed to identify and control small quantities of impurity which is likely to be present in the substance.

Limit test of heavy metals is based on the reaction of metallic impurities with hydrogen sulfide in acidic medium to form brownish colour solution. Metals that response to this test are lead, mercury, bismuth, arsenic, antimony, tin, cadmium, silver, copper, and molybdenum.

PROCEDURE:

The Indian Pharmacopoeia has adopted three methods for the limit test of heavy metals.

METHOD I:

Use for the substance which gives clear colourless solution under the specific condition.

Test Solution	Standard Solution
Solution is prepared as per the monograph and 25 ml is transferred in Nessler's cylinder	Take 2 ml of standard lead solution and dilute to 25 ml with water
Adjust the pH between 3 to 4 by adding dilute acetic acid 'Sp' or dilute ammonia solution 'Sp'	Adjust the pH between 3 to 4 by adding dilute acetic acid 'Sp' or dilute ammonia solution 'Sp'
Dilute with water to 35 ml	Dilute with water to 35 ml
Add freshly prepared 10 ml of hydrogen sulphide solution	Add freshly prepared 10 ml of hydrogen sulphide solution
Dilute with water to 50 ml	Dilute with water to 50 ml
Allow to stand for five minutes	Allow to stand for five minutes
View downwards over a white surface	View downwards over a white surface

METHOD II:

Use for the substance which do not give clear colourless solution under the specific condition.

Test Solution	Standard Solution
Weigh specific quantity of test substance, moisten with sulphuric acid and ignite on a low flame till completely charred Add few drops of nitric acid and heat to 500 °C Allow to cool and add 4 ml of hydrochloric acid and evaporate to dryness Moisten the residue with 10 ml of hydrochloric acid and digest for two minutes Neutralize with ammonia solution and make just acid with acetic acid	Take 2 ml of standard lead solution and dilute to 25 ml with water
Adjust the pH between 3 to 4 and filter if necessary	Adjust the pH between 3 to 4 by adding dilute acetic acid 'Sp' or dilute ammonia solution 'Sp'
Dilute with water to 35 ml	Dilute with water to 35 ml
Add freshly prepared 10 ml of hydrogen sulphide solution	Add freshly prepared 10 ml of hydrogen sulphide solution
Dilute with water to 50 ml	Dilute with water to 50 ml
Allow to stand for five minutes	Allow to stand for five minutes
View downwards over a white surface	View downwards over a white surface

METHOD III:

Use for the substance which gives clear colorless solution in sodium hydroxide solution.

Test Solution	Standard Solution
Solution is prepared as per the monograph and 25 ml is transferred in Nessler's cylinder or weigh specific amount of substance and dissolve in 20 ml of water and add 5 ml of dilute sodium hydroxide solution	Take 2 ml of standard lead solution
Make up the volume to 50 ml with water	Add 5 ml of dilute sodium hydroxide solution and make up the volume to 50 ml with water
Add 5 drops of sodium sulphide solution	Add 5 drops of sodium sulphide solution
Mix and set aside for 5 min	Mix and set aside for 5 min
View downwards over a white surface	View downwards over a white surface

OBSERVATION:

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RESULT AND DISCUSSION:

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VIVA QUESTIONS

Q.1 What is Limit test?

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Q.2 What is Nessler cylinder?

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Q.3 What are Heavy Metals?

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Experiment No. 5

OBJECT:

To perform Limit test for Lead.

REFERENCE:

1. Belsare D.P., Dhake A.S., Inorganic Pharmaceutical Chemistry, Second edition-2008, Career Publications Nashik, Page no- 82-83.
2. Chatwal G.R., Pharmaceutical Chemistry Inorganic, Fifth edition- 2008, Himalaya Publishing House Pvt. Ltd. Mumbai, Page no- 54-56.

APPARATUS AND CHEMICAL REQUIREMENT:

Dithizone, Ammonium citrate, Potassium cyanide, Hydroxylamine hydrochloride, Phenol Red, Ammonia, Nitric Acid, Ammonium Cyanide, Alcohol, Chloroform, Seperating Funnel, Stopperd Bottle Beaker, Glass Rod

THEORY:

Limit test is defined as quantitative or semi quantitative *test* designed to identify and control small quantities of impurity which is likely to be present in the substance.

Limit test of lead is based on the reaction of lead and diphenyl thiocabazone (dithizone) in alkaline solution to form lead dithizone complex which is read in color. Dithizone is green in color in chloroform and lead-dithizone complex is violet in color, so the resulting color at the end of process is red.

PROCEDURE:

Test Solution	Standard Solution
A known quantity of sample solution is transferred in a separating funnel	A standard lead solution is prepared equivalent to the amount of lead permitted in the sample under examination
Add 6ml of ammonium citrate	Add 6ml of ammonium citrate
Add 2 ml of potassium cyanide and 2 ml of hydroxylamine hydrochloride	Add 2 ml of potassium cyanide and 2 ml of hydroxylamine hydrochloride
Add 2 drops of phenol red	Add 2 drops of phenol red
Make solution alkaline by adding ammonia solution.	Make solution alkaline by adding ammonia solution.
Extract with 5 ml of dithizone until it becomes green	Extract with 5 ml of dithizone until it becomes green
Combined dithizone extracts are shaken for 30 mins with 30 ml of nitric acid and the chloroform layer is discarded	Combined dithizone extracts are shaken for 30 mins with 30 ml of nitric acid and the chloroform layer is discarded
To the acid solution add 5 ml of standard dithizone solution	To the acid solution add 5 ml of standard dithizone solution
Add 4 ml of ammonium cyanide	Add 4 ml of ammonium cyanide
Shake for 30 mins	Shake for 30 mins
Observe the color	Observe the color

OBSERVATION:

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RESULT AND DISCUSSION:

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VIVA QUESTIONS

Q.1 What is Limit test?

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Q.2 Which colour shows Lead dithiozone in Chloroform?

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Q.3 What is Dithizone?

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Experiment No. 6

OBJECT:

To perform Limit test for Arsenic.

REFERENCE:

1. Belsare D.P., Dhake A.S., Inorganic Pharmaceutical Chemistry, Second edition-2008, Career Publications Nashik, Page no- 83-85.
2. Chatwal G.R., Pharmaceutical Chemistry Inorganic, Fifth edition- 2008, Himalaya Publishing House Pvt. Ltd. Mumbai, Page no- 58-63.

APPARATUS AND CHEMICAL REQUIREMENT:

Gutzeit Apparatus, Cotton, Mercuric Chloride Paper, Stannated Hydrochloric Acid, Lead Acetate solution, Potassium Iodide, Arsenic Trioxide, Conc. Hydrochloric Acid, Zinc, Beaker, Glass rod.

THEORY:

Limit test of Arsenic is based on the reaction of arsenic gas with hydrogen ion to form yellow stain on mercuric chloride paper in presence of reducing agents like potassium iodide. It is also called as Gutzeit test. Arsenic, present as arsenic acid in the sample is reduced to arsenious acid by reducing agents like potassium iodide, stannous acid, zinc, hydrochloric acid, etc. Arsenious acid is further reduced to arsine (gas) by hydrogen and reacts with mercuric chloride paper to give a yellow stain.

$$\underset{\text{Arsenic acid}}{H_3AsO_4} + H_2SnO_2 \rightarrow \underset{\text{Arsenious acid}}{H_3AsO_3} + H_2SnO_3$$

$$\underset{\text{Arsenious acid}}{H_3AsO_3} + 3H_2 \rightarrow \underset{\text{Arsine}}{AsH_3} + 3H_2O$$

The depth of yellow stain on mercuric chloride paper will depend upon the quality of arsenic present in the sample.

PROCEDURE:

Test solution:

The test solution is prepared by dissolving specific amount in water and stannated HCl (arsenic free) and kept in a wide mouthed bottle.

To this solution 1 gm of KI, 5 ml of stannous chloride acid solution and 10 gm of zinc is added (all this reagents must be arsenic free)

Keep the solution aside for 40 min and stain obtained on mercuric chloride paper is compared with standard solution.

Standard solution:
A known quantity of dilute arsenic solution is kept in wide mouthed bottle.

To this solution 1 gm of KI, 5 ml of stannous chloride acid solution and 10 gm of zinc is added (all this reagents must be arsenic free)

Keep the solution aside for 40 min and stain obtained on mercuric chloride paper is compared with test solution.

OBSERVATION:

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RESULT AND DISCUSSION:

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VIVA QUESTIONS

Q.1 What is Limit test?

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Q.2 What is Gutzeit Apparatus?

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Q.3 What is the use of Zinc in Limit test of Arsenic?

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Q.4 Which gas stains Mercuric Chloride paper yellow?

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Experiment No. 7

OBJECT:

To prepare and submit Boric Acid.

REFERENCE:

1. Belsare D.P., Dhake A.S., Inorganic Pharmaceutical Chemistry, Second edition-2008, Career Publications Nashik, Page no- 88.
2. Chatwal G.R., Pharmaceutical Chemistry Inorganic, Fifth edition- 2008, Himalaya Publishing House Pvt. Ltd. Mumbai, Page no- 127-130.

APPARATUS AND CHEMICAL REQUIREMENT:

Borax, Hydrochloric Acid, Beaker, Glass Rod, Burner

THEORY:

Boric acid, also called hydrogen borate. It is a weak, monobasic Lewis acid of boron often used as an antiseptic, insecticide, flame retardant, neutron absorber, or precursor to other chemical compounds. It has the chemical formula H_3BO_3 (sometimes written $B(OH)_3$), and exists in the form of colorless crystals or a white powder that dissolves in water. Boric acid can be used as an antiseptic for minor burns or cuts and is sometimes used in dressings or salves. Boric acid is applied in a very dilute solution as an eye wash. It can be used as an acne treatment. It is also used as prevention of athlete's foot, by inserting powder in the socks or stockings.

PROCEDURE:

1. Take 25 ml of hydrochloric acid in a beaker.
2. Dilute it with 75 ml of water.
3. Take 6 gm of Borax and dissolve it in boiling water.
4. Add equal amount of hydrochloric acid in Borax solution.
5. Crystals of boric acid will start forming.
6. After about half an hour, filter it.

7. Collect the boric acid crystals.
8. Wash the beaker only with cold water to prevent loss of any boric acid.

OBSERVATION:

- Theoretical Yield:
- Practical Yield:
- % Yield:
- Melting Point: 171^{o}C

RESULT AND DISCUSSION:

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VIVA QUESTIONS

Q.1 What is Borax?

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Q.2 What are the uses of Boric acid?

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Q.3 What are the properties of Boric acid?

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Experiment No. 8

OBJECT:

To prepare and submit Potash Alum.

REFERENCE:

1. Belsare D.P., Dhake A.S., Inorganic Pharmaceutical Chemistry, Second edition-2008, Career Publications Nashik, Page no- 91.
2. Chatwal G.R., Pharmaceutical Chemistry Inorganic, Fifth edition- 2008, Himalaya Publishing House Pvt. Ltd. Mumbai, Page no- 223-224.

APPARATUS AND CHEMICAL REQUIREMENT:

Potassium sulphate, Aluminium sulphate, Dil. Sulphuric acid, Distilled water, Beakers, China dish, Funnel, Glass rod, Tripod stand, Wire gauze, Burner.

THEORY:

Potash alum is also known as potassium alum. It is also known as aluminum potassium sulfate. This is the type of alum that you find in the grocery store for pickling and in baking powder. It is also used in leather tanning, as a flocculant in water purification, as an ingredient in aftershave and as a treatment to fireproof textiles. It's chemical formula is $KAl(SO_4)_2$.

They are soluble in water, have a sweetish taste, react acid to litmus. When heated, they liquify, and if the heating is continued, the water of crystallization is driven off, the salt froths and swells, and at last an amorphous powder remains. They are astringent and acidic.

PROCEDURE:

1. Take 2.5g potassium sulphate in a clean beaker.
2. To this add 20ml of distilled water and stir using a glass rod until the crystals completely dissolve.
3. Take 10g aluminium sulphate in another beaker.
4. Add about 20ml of distilled water and 1ml of dil. sulphuric acid to it.
5. Heat the contents of the beaker for about 5 minutes.

6. Mix the two solutions in a china dish.
7. Heat the solution in the china dish for some time to concentrate it to the crystallisation point.
8. Transfer the solution into a crystallising dish and do not disturb it.
9. On cooling crystals of potash alum separate.
10. Decant the mother liquor and wash the crystals with a small quantity of ice cold water.
11. Dry the crystals by placing them between filter paper pads.
12. Find the weight of the crystals.

OBSERVATION:

- Theoretical Yield:
- Practical Yield:
- % Yield:
- Melting Point: 171^{o}C

RESULT AND DISCUSSION:

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VIVA QUESTIONS

Q.1 What are the uses of Potash Alum?

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Q.2 What are the other names of Alum?

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Experiment No. 9

OBJECT:

To prepare and submit Ferrous Sulphate.

REFERENCE:

1. Belsare D.P., Dhake A.S., Inorganic Pharmaceutical Chemistry, Second edition-2008, Career Publications Nashik, Page no- 86.
2. Chatwal G.R., Pharmaceutical Chemistry Inorganic, Fifth edition- 2008, Himalaya Publishing House Pvt. Ltd. Mumbai, Page no- 306-307.

APPARATUS AND CHEMICAL REQUIREMENT:

Iron, Sulphuric acid, Beaker, Filter paper, Burner

THEORY:

Ferrous sulfate ($FeSO_4.7H_2O$), traditionally known as "green vitriol" or "copperas", forms beautiful blue-green crystals of the monoclinic system. It is an efflorescent compound and when exposed in air for long time is oxidized to give brown color of ferric salt. Ferrous sulfate is useful in chemistry as a reducing agent and a source of ferrous ions. It can also act as a catalyst. It is used as reducing agent, as modant in dye and also in manufacturing of ink.

PROCEDURE:

1. Take 20 ml of Dil. Sulphuric acid in a beaker.
2. Add 5 gm of Iron in above solution.
3. When effervescences ceases, filter the liquid.
4. Now concentrate the solution and cool.
5. Green crystals of Ferrous sulphate occurs.
6. Separate the crystals and dry.

OBSERVATION:

- Theoretical Yield:
- Practical Yield:
- % Yield:
- Melting Point: 171^{o}C

RESULT AND DISCUSSION:

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VIVA QUESTIONS

Q.1 What are Haematinics?

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Q.2 What are the uses of Ferrous sulphate?

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Q.3 What is Green vitriol?

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Q.4 Why Ferrous sulphate is stored in tightly closed container?

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Experiment No. 10

OBJECT:

To perform identification test for Sodium Bicarbonates.

REFERENCE:

1. Chatwal G.R., Pharmaceutical Chemistry Inorganic, Fifth edition- 2008, Himalaya Publishing House Pvt. Ltd. Mumbai, Page no- 438-439.

APPARATUS AND CHEMICAL REQUIREMENT:

Sodium Bicarbonate, Mercuric Chloride solution, Beaker, Burner.

THEORY:

Sodium bicarbonate is a white crystalline powder. It is stable in dry air, but slowly decomposes in moist air. Its solutions, when freshly prepared with cold water without shaking, are alkaline to litmus. The alkalinity increases as the solutions stand, are agitated, or are heated. It is insoluble in alcohol.

PROCEDURE:

1. When solution of Sodium Bicarbonate is boiled, carbon dioxide is evolved.
2. Aqueous solution of Sodium Bicarbonate when treated with mercuric chloride solution, yields a white precipitate of mercuric bicarbonate. It changes colour due to hydrolysis to mercuric hydroxide, which decomposes to yield red mercuric oxides.

OBSERVATION:

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RESULT AND DISCUSSION:

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VIVA QUESTIONS

Q.1 What are the properties of Sodium Bicarbonate?

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Q.2 What are the uses of Sodium Bicarbonate?

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