

LIMIT TEST FOR IRON

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Aim :

- To perform the limit test for iron on a given sample as per Indian pharmacopoeia and report on its standard.

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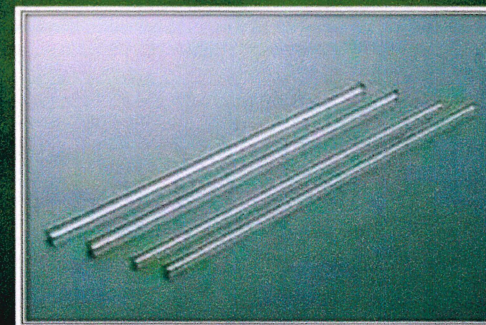
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Apparatus required:

Nessler's cylinder



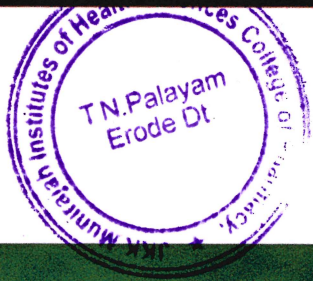
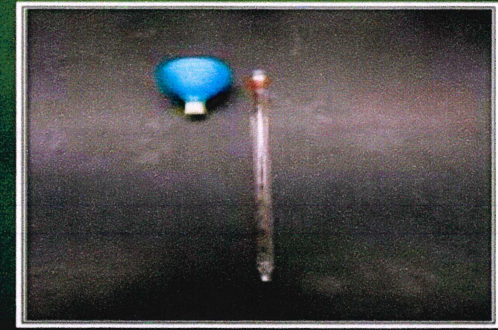
Glass rod-2



Measuring cylinder

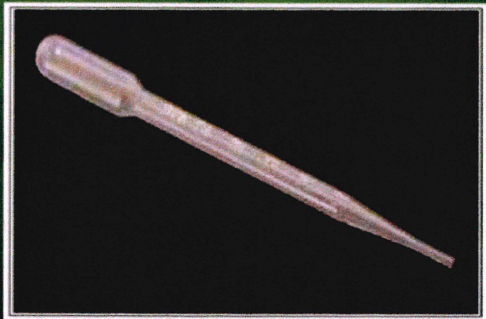


Pipette

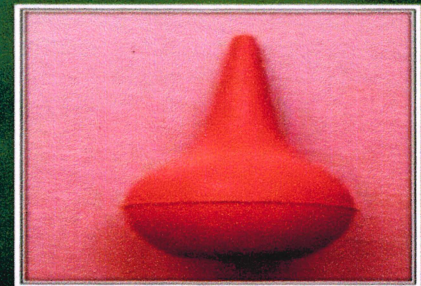


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Dropper



Rubber stopper



Chemicals required :

Iron free citric acid

20 % w/v solution of Citric acid

20 g of citric acid in 100 ml of water



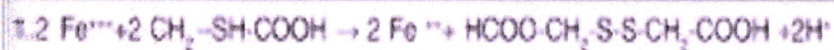
Ammonia

- 10 % w/v of ammonia in water.

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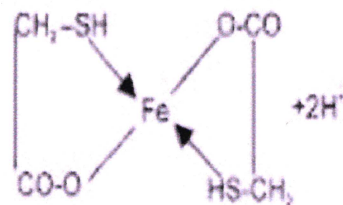
Principle:



Ferric Thioglycollic acid Ferrous



Dil. ammonia
Citric acid



Ferrous

Thioglycollic acid

(Ferrous thioglycolate complex)

- The limit test for iron is based on the reaction of iron in ammonical solution in the presence of citric acid with thioglycolic acid. When a pale pink to deep reddish purple colour is formed due to the ferrous thioglycolate complex. The color produced from a specific amount of substance from test is compared with the color produced in standard solution by viewing vertically .

- Ferric ammonium sulphate is used as standard.
- The test is very sensitive , interference of other metal cations is eliminated by using of 20 % w/v citric acid .
- The iron free citric acid is used to complex metal cations other than iron if any.

- Ferrous thioglycollate complex is colorless in acidic or neutral solutions.
- Only in the presence of alkali pale pink color will be produced.
- citric acid forms ammonium citrate buffer when ammonia is added to make alkaline which in turn stabilizes the complex formed.

| Standard | Test |
|---|---|
| Pipette out 2 ml of standard Iron solution into the Nessler's cylinder marked as standard Dilute it to 40 ml with distilled water | Dissolve the specified quantity of given sample in distilled water in Nessler's cylinder marked as test Dilute it to 40 ml with distilled water |
| Add 2 ml of 20 % w/v solution of iron free citric acid | Add 2 ml of 20 % w/v solution of iron free citric acid |
| Add 0.1 ml of thioglycolic acid. | Add 0.1 ml of thioglycolic acid. |
| Mix and make alkaline with iron free ammonia solution and dilute to 50ml with water Immediately stir with a glass rod and allow it to stand for five minutes | Mix and make alkaline with iron free ammonia solution and dilute to 50ml with water Immediately stir with a glass rod and allow it to stand for five minutes |



Procedure for TEST

1. Take one 50 ml Nessler cylinder and label as 'TEST'.



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TEST

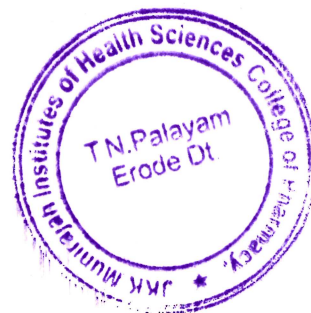
- Compare the color produced in test solution with standard solution.
- **Precaution:**
- Same glass rod should not be used because it will affect your observation.

Sample II [Fail Sample] :

- **Observation:**
- The Colour produced in the test solution is more than standard solution.
- **Inference:**
- The given substance fails the limit test for Iron as per Indian pharmacopoeia when compared with that of a standard substance.

Mechanism of litmus paper

- Red litmus contains a weak diprotic acid. When it is exposed to a basic compound, the hydrogen ions react with the added base. The conjugated base, formed from the litmus acid, has a blue color, so the wet red litmus paper turns blue in alkaline solution



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thank you