

EXPERIMENT 1

Aim: To perform the limit test for chlorides in the given sample of Sodium Chloride (NaCl).

References

- (i) Indian Pharmacopoeia, 2007. Vol I, PP 75-76. Government of India. Ministry of Health & Family Welfare. Indian Pharmacopoeia Commission, Ghaziabad.
- (ii) Singh H & Kapoor V.K. Practical Pharmaceutical Chemistry. Vallabh Prakashan. 2008. PP 54-56

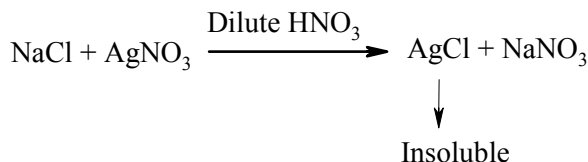
Requirement

Chemicals: Dilute Nitric acid (10%), Silver nitrate (5%), Sodium chloride.

Apparatus: Nessler's cylinders, Stand, Glass rod, Pipettes, Measuring cylinder.

Theory

This test, which is mainly used to control chloride impurity in inorganic substance, depends upon the simple reaction between silver nitrate and soluble chlorides to give insoluble silver chloride in the presence of dilute nitric acid. The insoluble silver chloride appears as solid particles (Opalescence) in the solution and the extent of opalescence depending upon the amount of chloride present in the substance is compared with a standard opalescence produced in a standard solution having a known amount of chloride by adding silver nitrate and same volume of dilute nitric acid as used in the test solution.



If the opalescence produced in the test is less intense than that of standard opalescence, the sample passes the limit test for chloride and vice versa.

Procedure

Take two Nessler Cylinder. Label one as “Test” and the other as “Standard”

S. No.	Standard Nessler Cylinder	Test Nessler Cylinder
1	Place 1ml of 0.05845%w/v solution of Sodium chloride in 50ml Nessler cylinder	Dilute the specific quantity of the sample (1g) with water (10 ml) in 50ml Nessler cylinder
2	Add 10ml of dilute Nitric acid	Add 10 ml of dilute Nitric acid
3	Add 1ml of Silver Nitrate (AgNO_3) reagent or solution.	Add 1ml of Silver Nitrate (AgNO_3) solution or reagent.
4	Dilute to 50ml with distilled water. Stir immediately with glass rod	Dilute to 50ml with distilled water. Stir immediately with glass rod
5	Keep aside for 5 minutes	Keep aside for 5 minutes
6	Observe the opalescence /Turbidity	Observe the opalescence /Turbidity

Observation

Compare the opalescence by placing the two Nessler cylinders on a white tile and viewing vertically downwards through the colour of the liquid



Nessler Cylinder

Conclusion (Comparison of the Test sample with Standard):

The opalescence produced by the sample under test is compared with the opalescence produced by the standard. If opalescence produces in sample

solution is less than the standard solution, the sample will pass the limit test of chloride and vice versa.

Discussion

Nitric acid is added in the limit test of chloride to make solution acidic and helps silver chloride precipitate. It prevents the precipitation of other acid radicals with silver nitrate solution by providing common ion i.e. nitrate.

Result

The given sample **Passes / Fails** the Limit test for chloride and shows **Positive / Negative** result of the limit test for chloride

Number of Exercises may be Performed

Alternatively, the following substances along with appropriate directions are proposed for selection of experiments.

- **Borax:** 0.9-1g with the limit test for chlorides
- **Calcium Gluconate:** 500 mg complies with the limit test for chlorides.
- **Ferrous Gluconate:** 500 mg comply with the limit test for chlorides.
- **Dextrose:** approx. 1g complies with the limit test for chlorides.
- **Magnesium Sulphate:** approx. 1g complies with the limit test for chlorides.
- **Sodium Bicarbonate:** 1g dissolved in water with the addition of nitric acid (2ml), complies with the limit test for chlorides.