

EXPERIMENT NO -5

OBJECT: To perform a limit test for sulphate in a given sample of tap water.

REFERENCES:

Parle A., "Pharmaceutical Chemistry 1 Laboratory Manual", CBS Publishers and Distributors Pvt. Ltd., Ed Ist, 2008, pp 59

REQUIREMENTS

Chemical required: Hydrochloric acid, Barium sulphate, and Barium chloride

Apparatus required: Measuring cylinder, glass rod, pipette and Nessler's cylinder, etc.

THEORY

Limit tests are quantitative or semi-quantitative test designed to identify and control a small number of impurities which are likely to be present in the substance. This test involves the reaction of Barium chloride with soluble sulphate to form the precipitate of Barium sulphate which is insoluble in dilute hydrochloric acid. The Barium sulphate precipitate is white in color.

REACTION - $\text{SO}_4^{--} + \text{BaCl}_2 \rightarrow \text{BaSO}_4 + \text{Cl}^-$

(White ppt.)

$\text{Na}_2\text{SO}_4 + \text{BaCl}_2 \rightarrow \text{BaSO}_4 + \text{NaCl}$

(White ppt.)

PROCEDURE

STANDARD - Take 1mL of 0.1089 w/v of Na₂SO₄ or K₂SO₄ as per I.P. in Nessler cylinder. Add 2 mL of dilute Hydrochloric acid. Makeup the volume up to 45 ml with distilled water. Add in this solution of 5 mL of Barium sulphate reagent. Stirrer the solution with a glass rod and allow to stand for 5 minutes.

TEST

Dissolve the specific quantity of test substances in 10 mL of tap water. Add 2 mL of dilute Hydrochloric acid. Makeup the volume up to 45 ml with distilled water. Add in this solution of 5 mL of Barium sulphate reagent Stirrer the solution with a glass rod and allow to stand for 5 minutes.

OBSERVATION

The opalescence of the test solution is less/more than the standard solution. If the opalescence of the test solution has been less than the standard opalescence, the sample will pass the limit test.

RESULT

Limit test for sulphate was performed