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Hydrochloric Acid

HCl 36.46

Hydrochloric acid CAS RN®: 7647-01-0.

DEFINITION

Hydrochloric Acid contains NLT 36.5% and NMT 38.0%, by weight, of HCl.

IDENTIFICATION

• **A. Identification Tests—General, *Chloride* ⟨191⟩**

ASSAY

• **Procedure**

Sample: 3 mL

Titrimetric system

(See *Titrimetry* ⟨541⟩.)

Mode: Direct titration

Titrant: 1 N sodium hydroxide VS

Blank: 45 mL of water

Endpoint detection: Visual

Analysis: Place the *Sample* in a glass-stoppered flask, previously tared while containing about 20 mL of water, and weigh again to obtain the weight of the substance under assay. Dilute with 25 mL of water, and add methyl red TS. Titrate with 1 N sodium hydroxide VS. Calculate the percentage of hydrochloric acid (HCl) in the *Sample* taken:

$$\text{Result} = [(V_S - V_B) \times N \times F]/W \times 100$$

V_S = volume of *Titrant* consumed by the *Sample* (mL)

V_B = volume of *Titrant* consumed by the *Blank* (mL)

N = actual normality of the *Titrant* (mEq/mL)

F = equivalency factor, 36.46 mg/mEq

W = weight of the *Sample* (mg)

Acceptance criteria: 36.5%–38.0%

IMPURITIES

• **Residue on Ignition ⟨281⟩**

Sample: 20 mL

Analysis: To the *Sample*, add 2 drops of sulfuric acid, evaporate to dryness, and ignite.

Acceptance criteria: NMT 2 mg of residue remains (about 0.008%).

SPECIFIC TESTS

• **Bromide or Iodide**

Sample solution: 1 part Hydrochloric Acid to 2 parts water

Analysis: Add 1 mL of chloroform to 10 mL of the *Sample solution*. Cautiously add, dropwise, with constant agitation, chlorine TS that has been diluted with an equal volume of water.

Acceptance criteria: The chloroform remains free from even a transient yellow, orange, or violet color.

- **Free Bromine or Chlorine**

  Sample solution: 1 part Hydrochloric Acid to 2 parts water

  Analysis: Add 1 mL of potassium iodide TS and 1 mL of chloroform to 10 mL of the *Sample solution*, and agitate the mixture.

  Acceptance criteria: The chloroform remains free from any violet color for at least 1 min.

- **Sulfate**

  Sample solution: 1 part Hydrochloric Acid to 2 parts water

  Analysis: To a mixture of 3 mL of the *Sample solution* and 5 mL of water, add 5 drops of barium chloride TS.

  Acceptance criteria: Neither turbidity nor precipitate appears within 1 h.

- **Sulfite**

  Sample solution: 1 part Hydrochloric Acid to 2 parts water

  Analysis: Complete the test for *Sulfate*, then add to the liquid 2 drops of 0.1 N iodine.

  Acceptance criteria: Neither turbidity nor decolorization of the iodine occurs.

ADDITIONAL REQUIREMENTS

- **Packaging and Storage:** Preserve in tight containers.

Auxiliary Information - Please check for your question in the FAQs before contacting USP.

Topic/Question	Contact	Expert Committee
HYDROCHLORIC ACID	Documentary Standards Support	SE2020 Simple Excipients

Chromatographic Database Information: Chromatographic Database

Most Recently Appeared In:
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