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# Nitric Acid

$HNO_3$ 63.01

Nitric acid CAS RN®: 7697-37-2.

### DEFINITION

Nitric Acid contains NLT 69.0% and NMT 71.0%, by weight, of nitric acid ($HNO_3$). [**Caution—**Avoid contact, because Nitric Acid rapidly destroys tissues.]

### IDENTIFICATION

• **A. Identification Tests—General, *Nitrate* ⟨191⟩:** Meets the requirements

### ASSAY

• **Procedure**

**Sample solution:** Weigh 2 mL of Nitric Acid in a glass-stoppered conical flask, and add 25 mL of water. Add methyl red TS.

**Analysis:** Titrate the *Sample solution* with 1 N sodium hydroxide VS. Each mL of 1 N sodium hydroxide is equivalent to 63.01 mg of $HNO_3$ (see *Titrimetry* ⟨541⟩).

**Acceptance criteria:** 69.0%–71.0%

### IMPURITIES

• **Residue on Ignition** ⟨281⟩

**Sample:** 70 mL (100 g)

**Analysis:** Place the *Sample* in a tared crucible, add 2 drops of sulfuric acid, and evaporate to dryness. Ignite for 15 min.

**Acceptance criteria:** NMT 0.5 mg (5 ppm)

• **Chloride and Sulfate, *Chloride* ⟨221⟩**

**Sample:** 35 mL (50 g)

**Control:** 35 µL of 0.020 N hydrochloric acid

**Acceptance criteria:** NMT 0.5 ppm; the *Sample* shows no more chloride than corresponds to the *Control*.

• **Chloride and Sulfate, *Sulfate* ⟨221⟩**

**Sample:** 28 mL

**Control:** 40 µL of 0.020 N sulfuric acid in an equal volume of solution containing the quantities of reagents used in the analysis

**Analysis:** Add 10 mg of sodium carbonate to the *Sample*. Evaporate to dryness, dissolve in a mixture of 4 mL of water and 1 mL of dilute hydrochloric acid (50 mg/mL), and filter if necessary. Wash with two 2-mL portions of water, dilute with water to 10 mL, and add 1 mL of barium chloride TS. Observe 10 min after adding the barium chloride.

**Acceptance criteria:** 1 ppm; any turbidity produced by the *Sample* is not greater than that produced by the *Control*.

***Change to read:***

• ▲**Iron** ⟨241⟩, *Procedures, Procedure 1*▲ (CN 1-Jun-2023)

**Sample:** 35 mL (50 g)

**Analysis:** Evaporate the *Sample* to dryness, dissolve the residue in 2 mL of hydrochloric acid, and dilute with water to 47 mL.

**Acceptance criteria:** NMT 0.2 µg/g

### SPECIFIC TESTS

• **Clarity and Color of Solution**

**Analysis:** Mix it in its original container, and transfer 10 mL to a 20- × 150-mm test tube. Compare with water in a similar test tube.

**Acceptance criteria:** The liquids are equally clear and free from suspended matter, and when viewed transversely by transmitted light, exhibit no apparent difference in color.

### 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 |
|---|---|---|
| NITRIC ACID | Documentary Standards Support | SE2020 Simple Excipients |
| REFERENCE STANDARD SUPPORT | RS Technical Services<br>RSTECH@usp.org | SE2020 Simple Excipients |

**Chromatographic Database Information:** Chromatographic Database

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