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Nitrogen 97 Percent

DEFINITION

Nitrogen 97 Percent is Nitrogen produced from air by physical separation methods. It contains NLT 97.0%, by volume, of nitrogen (N_2).

IDENTIFICATION

• **A.** The flame of a burning wood splinter is extinguished when inserted into a test tube filled with Nitrogen 97 Percent. [Note—Exercise caution.]

ASSAY

• **Procedure**

Standard: Oxygen–helium certified standard (see *Reagents, Indicators, and Solutions*)

Sample: Nitrogen 97 Percent

Chromatographic system

(See *Chromatography ⟨621⟩, System Suitability*.)

Mode: GC

Detector: Thermal conductivity

Column: 3-m length × 4-mm inside diameter: molecular sieve prepared from a synthetic alkali-metal aluminosilicate capable of absorbing molecules having diameters of up to 0.5 nm and completely separating oxygen from nitrogen

Carrier gas: Helium (99.99%)

Temperature: Thermostatically controlled

Analysis

Samples: *Standard* and *Sample*

Introduce the *Samples* separately into the gas chromatograph by means of a gas sampling valve.

Acceptance criteria: The peak response produced by the *Sample* exhibits a retention time corresponding to that produced by the *Standard* and is equivalent to NMT 3.0% of oxygen when compared to the peak response of the *Standard*, indicating NLT 97.0%, by volume, of nitrogen (N_2).

IMPURITIES

[Note—Reduce the container pressure by means of a regulator. Measure the gases with a gas volume meter downstream from the detector tube to minimize contamination or change of the specimens.]

• **Carbon Dioxide**

Sample: 1000 ± 50 mL

Analysis: Pass the *Sample* through a carbon dioxide detector tube (see *Reagents, Indicators, and Solutions*) at the rate specified for the tube.

Acceptance criteria: The indicator change corresponds to NMT 300 ppm

• **Carbon Monoxide**

Sample: 1000 ± 50 mL

Analysis: Pass the *Sample* through a carbon monoxide detector tube (see *Reagents, Indicators, and Solutions*) at the rate specified for the tube.

Acceptance criteria: NMT 10 ppm

• **Sulfur Dioxide**

Sample: 1000 ± 50 mL

Analysis: Pass the *Sample* through a sulfur dioxide detector tube (see *Reagents, Indicators, and Solutions*) at the rate specified for the tube.

Acceptance criteria: NMT 5 ppm

• **Limit of Nitric Oxide and Nitrogen Dioxide**

Sample: 500 ± 50 mL

Analysis: Pass the *Sample* through a nitric oxide–nitrogen dioxide detector tube (see *Reagents, Indicators, and Solutions*) at the rate specified for the tube.

Acceptance criteria: NMT 2.5 ppm

• **Limit of Oxygen**

Analysis: Determined as directed in the *Assay*

Acceptance criteria: NMT 3.0%

SPECIFIC TESTS

• **Odor**

Analysis: Carefully open the container valve to produce a moderate flow of gas. Do not direct the gas stream toward the face, but deflect a portion of the stream toward the nose.

Acceptance criteria: No appreciable odor is discernible.

ADDITIONAL REQUIREMENTS

• **Packaging and Storage:** Preserve in cylinders or in a low-pressure collecting tank.

• **Labeling:** Where it is piped directly from the collecting tank to the point of use, label each outlet “Nitrogen 97 Percent”.

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

Topic/Question	Contact	Expert Committee
NITROGEN 97 PERCENT	Documentary Standards Support	SM42020 Small Molecules 4
REFERENCE STANDARD SUPPORT	RS Technical Services RSTECH@usp.org	SM42020 Small Molecules 4

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