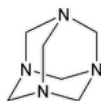


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Methenamine



$C_6H_{12}N_4$ 140.19

1,3,5,7-Tetraazatricyclo[3.3.1.1^{3,7}]decane;

Hexamethylenetetramine CAS RN®: 100-97-0; UNII: J500IX95QV.

DEFINITION

Methenamine, dried over phosphorus pentoxide for 4 h, contains NLT 99.0% and NMT 100.5% of methenamine ($C_6H_{12}N_4$).

IDENTIFICATION

• **A.** [SPECTROSCOPIC IDENTIFICATION TESTS \(197\)](#), [Infrared Spectroscopy: 197K](#)

• **B.**

Analysis: Heat a solution (1 in 10) with 2 N sulfuric acid.

Acceptance criteria: Formaldehyde is liberated, recognizable by its odor and by its darkening of paper moistened with silver ammonium nitrate TS. On the subsequent addition of an excess of 1 N sodium hydroxide to the solution, ammonia is evolved.

ASSAY

Change to read:

• **PROCEDURE**

Chromotropic acid spot test solution: Suspend 100 mg of chromotropic acid in 2 mL of water, and cautiously add 3 mL of sulfuric acid. Allow to cool, and add 25 mL of sulfuric acid. If excessive heat generated during mixing causes a violet color to appear in the solution, discard the solution and prepare another, taking precautions to avoid excessive heat.

Sample solution: Transfer 1 g of Methenamine, previously dried, to a beaker. Add 40.0 mL of 1 N sulfuric acid VS, and heat to a gentle boil, adding water from time to time if necessary, until the formaldehyde has been expelled. Test for the absence of formaldehyde by adding a drop of the assay solution to a glass fiber filter disk, on a watch glass, on which has previously been placed 3 or 4 drops of *Chromotropic acid spot test solution*. Formaldehyde produces a violet color with this reagent. Repeat the test until no violet color is obtained on the warmed test filter disk upon comparison with a blank filter disk to which no assay specimen is added. Cool, add 20 mL of water, then add methyl red TS.

Titrimetric system

Mode: Residual titration

Titrant: 1 N sulfuric acid VS

Back-titrant: 1 N sodium hydroxide VS

Endpoint detection: Visual

Analysis: Titrate the excess acid in the *Sample solution* with 1 N sodium hydroxide VS. Perform a blank determination (see ▲ [Titrimetry \(541\)](#) ▲ (CN 1-Aug-2024)). Each mL of 1 N sulfuric acid is equivalent to 35.05 mg of methenamine ($C_6H_{12}N_4$).

Acceptance criteria: 99.0%–100.5%

IMPURITIES

• [RESIDUE ON IGNITION \(281\)](#): NMT 0.1%

• [CHLORIDE AND SULFATE, Chloride\(221\)](#).

Sample: 1.0 g

Acceptance criteria: 0.014%; shows no more chloride than corresponds to 0.20 mL of 0.020 N hydrochloric acid.

• **SULFATE**

Sample solution: 20 mg/mL

Analysis: 10 mL of the *Sample solution*, acidified with 5 drops of hydrochloric acid. Add 5 drops of barium chloride TS.

Acceptance criteria: No turbidity is produced within 1 min.

SPECIFIC TESTS

• [LOSS ON DRYING \(731\)](#).

Analysis: Dry over phosphorus pentoxide for 4 h.

Acceptance criteria: NMT 2.0%

• **AMMONIUM SALTS**

Sample solution: 50 mg/mL

Analysis: Add to 10 mL of the *Sample solution* 1 mL of alkaline mercuric–potassium iodide TS.

Acceptance criteria: The mixture is not darker in color than a mixture of 1 mL of the reagent and 10 mL of water.

ADDITIONAL REQUIREMENTS

• **PACKAGING AND STORAGE:** Preserve in well-closed containers.

• **USP REFERENCE STANDARDS (11).**

[USP Methenamine RS](#)

Auxiliary Information - Please [check for your question in the FAQs](#) before contacting USP.

Topic/Question	Contact	Expert Committee
METHENAMINE	Documentary Standards Support	SM12020 Small Molecules 1
REFERENCE STANDARD SUPPORT	RS Technical Services RSTECH@usp.org	SM12020 Small Molecules 1

Chromatographic Database Information: [Chromatographic Database](#)

Most Recently Appeared In:

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