HEXAMETHYLENETETRAMINE

Prepared at the 17th JECFA (1973), published in FNP 4 (1978) and in FNP 52 (1992). Metals and arsenic specifications revised at the 63rd JECFA (2004). An ADI of 0-0.15 mg/kg bw was established at the 17th JECFA (1973)

SYNONYMS Hexamine, methenamine, INS No. 239

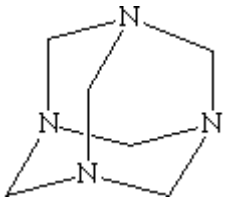
DEFINITION

Chemical names 1,3,5,7-Tetraazatricyclo[3.3.1.$1^{3,7}$]-decane, hexamethylenetetramine

C.A.S. number 100-97-0

Chemical formula $C_6H_{12}N_4$

Structural formula



Formula weight 140.19

Assay Not less than 99.0% on the dried basis

DESCRIPTION Nearly odourless, colourless lustrous crystals, or white crystalline powder

FUNCTIONAL USES Antimicrobial preservative

CHARACTERISTICS

IDENTIFICATION

Solubility (Vol. 4) Freely soluble in water, soluble in ethanol

Test for formaldehyde Heat a 1 in 10 solution of the sample with dilute sulfuric acid TS. Formaldehyde is liberated, recognizable by its odour and by its darkening of paper moistened with silver ammonium nitrate TS.

Test for ammonia (Vol. 4) Passes test

PURITY

Loss on drying (Vol. 4) Not more than 2.0% (over P_2O_5, 4 h)

Sulfated ash (Vol. 4) Not more than 0.05%
Test 2 g of the sample (Method I)

Ammonium salts Add 1 ml of Nessler's reagent TS to 10 ml of a 5% solution of the sample. The mixture should not be darker than a mixture of 1 ml of the reagent in 10

ml of water.

Lead (Vol. 4)

Not more than 2 mg/kg
Determine using an atomic absorption technique appropriate to the specified level. The selection of sample size and method of sample preparation may be based on the principles of the method described in Volume 4, “Instrumental Methods.”

METHOD OF ASSAY

Weigh, to the nearest 0.1 mg, 1 g of the sample, previously dried for 4 h over phosphorus pentoxide. Transfer into a beaker and add 40.00 ml of N sulfuric acid. Boil gently adding water from time to time, if necessary, until the odour of formaldehyde is no longer perceptible. Cool, add 20 ml of water, and methyl red TS and titrate the excess acid with N sodium hydroxide. Each ml of N sulfuric acid is equivalent to 35.05 mg of $C_6H_{12}N_4$.