

MATERIAL SAFETY DATA SHEET

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Version 1.3

Section 1 - Product and Company Information

Product Name	HEXAMETHYLENETETRAMINE, 99%
Product Number	H11300
Brand	ALDRICH
Company	Sigma-Aldrich
Street Address	3050 Spruce Street
City, State, Zip, Country	SAINT LOUIS MO 63103 US
Technical Phone:	314 771 5765
Emergency Phone:	414 273 3850 Ext. 5996
Fax:	800 325 5052

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
HEXAMETHYLENETETRAMINE	100-97-0	No

Formula	C6H12N4
Synonyms	Aceto HMT * Aminoform * Ammoform * Ammonioformaldehyde * Cystamin * Cystogen * Esametilentetramina (Italian) * Formamine * Formin * Hexaform * Hexamethylenamine * Hexamethyleneamine * Hexamethylenetetraamine * Hexamethylentetramin (German) * Hexamethylentetramine * Hexilmethylenamine * HMT * Methamin * Methenamine * Preparation AF * Resotropin * 1,3,5,7-Tetraazaadamantane * 1,3,5,7-Tetraazatricyclo(3.3.1.1(sup 37))decane * Uritone * Urotropin * Urotropine

RTECS Number:	MN4725000
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Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Flammable (USA) Highly Flammable (EU). Harmful.
May cause sensitization by inhalation and skin contact.
Target organ(s): Kidneys.

HMIS RATING

HEALTH: 3*
FLAMMABILITY: 2
REACTIVITY: 1

NFPA RATING

HEALTH: 3
FLAMMABILITY: 2
REACTIVITY: 1

*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

INHALATION EXPOSURE

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

DERMAL EXPOSURE

In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

EYE EXPOSURE

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Section 5 - Fire Fighting Measures

FLAMMABLE HAZARDS

Flammable Hazards: Yes

EXPLOSION DATA

Dust Potential: This material, like most materials in powder form, is capable of creating a dust explosion.

FLASH POINT

482 °F 250 °C Method: closed cup

AUTOIGNITION TEMP

410 °C

FLAMMABILITY

N/A

EXTINGUISHING MEDIA

Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

FIREFIGHTING

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s): Flammable solid. Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL

Evacuate area. Shut off all sources of ignition. Use nonsparking tools.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP

Avoid raising dust. Sweep up, place in a bag and hold for waste disposal. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

HANDLING

User Exposure: Avoid contact with eyes, skin, and clothing.
Avoid breathing dust. Avoid prolonged or repeated exposure.

STORAGE

Suitable: Keep container closed. Keep away from heat, sparks, and open flame.

SPECIAL REQUIREMENTS

Hygroscopic.

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS

Safety shower and eye bath. Use nonsparking tools. Mechanical exhaust required.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory: Government approved respirator.
Hand: Compatible chemical-resistant gloves.
Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES

Wash thoroughly after handling. Wash contaminated clothing before reuse.

EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	4 MG/M3
Poland		NDSch	-
Poland		NDSP	-

Section 9 - Physical/Chemical Properties

Appearance Physical State: Solid
 Color: Colorless
 Form: Crystals

Property	Value	At Temperature or Pressure
Molecular Weight	140.19 AMU	
pH	N/A	
BP/BP Range	N/A	
MP/MP Range	280 °C	
Freezing Point	N/A	
Vapor Pressure	< 0.01 mmHg	20 °C
Vapor Density	N/A	
Saturated Vapor Conc.	N/A	
SG/Density	1.331 g/cm3	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Surface Tension	N/A	
Partition Coefficient	N/A	

Decomposition Temp.	N/A	
Flash Point	482 °F 250 °C	Method: closed cup
Explosion Limits	N/A	
Flammability	N/A	
Autoignition Temp	410 °C	
Refractive Index	N/A	
Optical Rotation	N/A	
Miscellaneous Data	N/A	
Solubility	Solubility in Water:soluble Other Solvents: ETHANOL, ACETONE, CHLOROFORM	

N/A = not available

Section 10 - Stability and Reactivity

STABILITY

Conditions to Avoid: Protect from moisture.

Materials to Avoid: Strong acids, Reacts with acids liberating formaldehyde, Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide, Nitrogen oxides.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE

Skin Contact: May cause skin irritation.

Skin Absorption: May be harmful if absorbed through the skin.

Eye Contact: May cause eye irritation.

Inhalation: May be harmful if inhaled. Material may be irritating to mucous membranes and upper respiratory tract.

Ingestion: May be harmful if swallowed.

SENSITIZATION

Sensitization: May cause allergic reaction.

TARGET ORGAN(S) OR SYSTEM(S)

Kidneys.

TOXICITY DATA

Intravenous

Rat

9200 MG/KG

LD50

Oral

Mouse

569 mg/kg

LD50

Remarks: Behavioral:Excitement. Behavioral:Muscle contraction or spasticity.

Subcutaneous

Mouse

215 MG/KG

LD50

Remarks: Behavioral:Tremor. Gastrointestinal:Changes in

structure or function of salivary glands.

Intravenous
Mouse
17700 UL/KG
LD50

CHRONIC EXPOSURE - CARCINOGEN

Species: Rat
Route of Application: Subcutaneous
Dose: 140 GM/KG
Exposure Time: 78W
Frequency: I
Result: Tumorigenic: Equivocal tumorigenic agent by RTECS
criteria. Tumorigenic: Tumors at site or application.

CHRONIC EXPOSURE - MUTAGEN

Species: Human
Dose: 100 UMOL/L
Cell Type: HeLa cell
Mutation test: Other mutation test systems

Species: Human
Dose: 1 MMOL/L
Cell Type: HeLa cell
Mutation test: Cytogenetic analysis

Species: Mouse
Route: Intraperitoneal
Dose: 25 GM/KG
Mutation test: Dominant lethal test

Species: Mouse
Route: Oral
Dose: 25 GM/KG
Mutation test: Dominant lethal test

Species: Hamster
Dose: 10 MG/L
Cell Type: kidney
Mutation test: Morphological transformation.

Section 12 - Ecological Information

No data available.

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

Contact a licensed professional waste disposal service to dispose of this material. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT

Proper Shipping Name: Hexamethylenetetramine
UN#: 1328

Class: 4.1
Packing Group: Packing Group III
Hazard Label: Flammable solid
PIH: Not PIH

IATA

Proper Shipping Name: Hexamethylenetetramine
IATA UN Number: 1328
Hazard Class: 4.1
Packing Group: III

Section 15 - Regulatory Information

EU DIRECTIVES CLASSIFICATION

Symbol of Danger: F Xn
Indication of Danger: Highly Flammable. Harmful.
R: 11 42/43
Risk Statements: Highly flammable. May cause sensitization by inhalation and skin contact.
S: 16 22 24 37
Safety Statements: Keep away from sources of ignition - no smoking. Do not breathe dust. Avoid contact with skin. Wear suitable gloves.

US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Flammable (USA) Highly Flammable (EU). Harmful.
Risk Statements: May cause sensitization by inhalation and skin contact.
Safety Statements: Keep away from sources of ignition - no smoking. Do not breathe dust. Avoid contact with skin. Wear suitable gloves.
US Statements: Target organ(s): Kidneys.

UNITED STATES REGULATORY INFORMATION

SARA LISTED: No
TSCA INVENTORY ITEM: Yes

CANADA REGULATORY INFORMATION

WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.
DSL: Yes
NDSL: No

Section 16 - Other Information

DISCLAIMER

For R&D use only. Not for drug, household or other uses.

WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2004 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.