SAFETY DATA SHEET

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers
Product name : Hexamethylphosphoramide
Product Number : H11602
Brand : Aldrich
Index-No. : 015-106-00-2
CAS-No. : 680-31-9

1.2 Relevant identified uses of the substance or mixture and uses advised against
Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet
Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES
Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone
Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture
GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Skin corrosion (Category 1C), H314
Serious eye damage (Category 1), H318
Germ cell mutagenicity (Category 1B), H340
Carcinogenicity (Category 1B), H350

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements
Pictogram

Signal Word : Danger
Hazard statement(s)
H314 Causes severe skin burns and eye damage.
H340 May cause genetic defects.
H350 May cause cancer.

Precautionary statement(s)
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P264 Wash skin thoroughly after handling.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P363 Wash contaminated clothing before reuse.
P405 Store locked up.
P501 Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances
Synonyms : HMPA
            Hexamethylphosphoric acid triamide
            Tris(dimethylamino)phosphine oxide

Formula : C₆H₁₈N₃OP
Molecular weight : 179.20 g/mol
CAS-No. : 680-31-9
EC-No. : 211-653-8
Index-No. : 015-106-00-2

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hexamethylphosphoramid</td>
<td>Skin Corr. 1C; Eye Dam. 1; Muta. 1B; Carc. 1B; H314, H318, H340, H350 Concentration limits: &gt;= 0.01 %: Carc. 1B, H350;</td>
<td>&lt;= 100 %</td>
</tr>
</tbody>
</table>

For the full text of the H-Statements mentioned in this Section, see Section 16.
SECTION 4: First aid measures

4.1 Description of first-aid measures

**General advice**
First aiders need to protect themselves. Show this material safety data sheet to the doctor in attendance.

**If inhaled**
After inhalation: fresh air. Call in physician.

**In case of skin contact**
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/shower. Call a physician immediately.

**In case of eye contact**
After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses.

**If swallowed**
After swallowing: make victim drink water (two glasses at most), avoid vomiting (risk of perforation). Call a physician immediately. Do not attempt to neutralise.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

**Suitable extinguishing media**
Water Foam Carbon dioxide (CO2) Dry powder

**Unsuitable extinguishing media**
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Carbon oxides
Nitrogen oxides (NOx)
Oxides of phosphorus
Thermal decomposition may produce toxic fumes of phosphorus oxides and/or phosphine
Carbon oxides
Nitrogen oxides (NOx)
Oxides of phosphorus
Combustible.
Vapors are heavier than air and may spread along floors.
Forms explosive mixtures with air on intense heating.
Development of hazardous combustion gases or vapours possible in the event of fire.

5.3 Advice for firefighters
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.
5.4 Further information
Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
Advice on safe handling
Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

Hygiene measures
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
Tightly closed. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorized persons.
Air and moisture sensitive. Handle and store under inert gas.

Storage class
Storage class (TRGS 510): 6.1C: Combustible, acute toxic Cat.3 / toxic compounds or compounds which causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters
Ingredients with workplace control parameters
Contains no substances with occupational exposure limit values.
8.2 Exposure controls

Appropriate engineering controls
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Tightly fitting safety goggles

Body Protection
protective clothing

Respiratory protection
required when vapours/aerosols are generated. Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Control of environmental exposure
Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a) Appearance
Form: liquid

b) Odor
No data available

c) Odor Threshold
No data available

d) pH
No data available

e) Melting point/freezing point
Melting point/range: 7 °C (45 °F) - lit.

f) Initial boiling point and boiling range
230 - 232 °C 446 - 450 °F at 987 hPa - lit.

g) Flash point
144 °C (291 °F) - closed cup

h) Evaporation rate
No data available

i) Flammability (solid, gas)
No data available

j) Upper/lower flammability or explosive limits
No data available

k) Vapor pressure
No data available

l) Vapor density
6.19 - (Air = 1.0)

m) Density
1.03 g/cm³ at 25 °C (77 °F) - lit.

Relative density
No data available

n) Water solubility
No data available
9.2 Other safety information

Relative vapor density 6.19 - (Air = 1.0)

SECTION 10: Stability and reactivity

10.1 Reactivity
Forms explosive mixtures with air on intense heating.
A range from approx. 15 Kelvin below the flash point is to be rated as critical.

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature).

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
Strong heating.

10.5 Incompatible materials
Strong oxidizing agents, Strong acids

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 2,650 mg/kg
Remarks: Behavioral:Convulsions or effect on seizure threshold.
Kidney, Ureter, Bladder:Hematuria.
Kidney, Ureter, Bladder:Incontinence.
(RTECS)
Inhalation: No data available
LD50 Dermal - Rabbit - 2,600 mg/kg
Remarks: Behavioral:Altered sleep time (including change in righting reflex).
Behavioral:Somnolence (general depressed activity).
Lungs, Thorax, or Respiration:Dyspnea.
(RTECS)
**Skin corrosion/irritation**  
Remarks: Causes skin burns.

**Serious eye damage/eye irritation**  
Remarks: Causes serious eye damage.

**Respiratory or skin sensitization**  
No data available

**Germ cell mutagenicity**  
May cause genetic defects.

**Carcinogenicity**  
Presumed to have carcinogenic potential for humans  
IARC: 2B - Group 2B: Possibly carcinogenic to humans (Hexamethylphosphoramide)  
NTP: RAHC - Reasonably anticipated to be a human carcinogen (Hexamethylphosphoramide)  
OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA’s list of regulated carcinogens.

**Reproductive toxicity**  
No data available

**Specific target organ toxicity - single exposure**  
No data available

**Specific target organ toxicity - repeated exposure**  
No data available

**Aspiration hazard**  
No data available

**11.2 Additional Information**  
RTECS: TD0875000  
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.  
Liver - Irregularities - Based on Human Evidence

Liver - Irregularities - Based on Human Evidence

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**SECTION 12: Ecological information**

**12.1 Toxicity**  
Toxicity to fish: LC50 - Lepomis macrochirus (Bluegill) - 7,240 mg/l - 96 h  
Toxicity to daphnia and other aquatic invertebrates: EC50 - Daphnia magna (Water flea) - 6,670 mg/l - 48 h

**12.2 Persistence and degradability**  
No data available

**12.3 Bioaccumulative potential**  
Bioaccumulation: Cyprinodon variegatus (sheepshead minnow) - 33 d - 40.4 mg/l(Hexamethylphosphoramide)

Aldrich - H11602
12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Endocrine disrupting properties
No data available

12.7 Other adverse effects
No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself. See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14: Transport information

DOT (US)
UN number: 3267  Class: 8  Packing group: III
Proper shipping name: Corrosive liquid, basic, organic, n.o.s. (Hexamethylphosphoramid)
Reportable Quantity (RQ): 1 lbs
Poison Inhalation Hazard: No

IMDG
UN number: 3267  Class: 8  Packing group: III  EMS-No: F-A, S-B
Proper shipping name: CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S. (Hexamethylphosphoramid)

IATA
UN number: 3267  Class: 8  Packing group: III
Proper shipping name: Corrosive liquid, basic, organic, n.o.s. (Hexamethylphosphoramid)

SECTION 15: Regulatory information

SARA 302 Components
This material does not contain any components with a section 302 EHS TPQ.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

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<thead>
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### SARA 311/312 Hazards
Chronic Health Hazard

### Massachusetts Right To Know Components
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### Pennsylvania Right To Know Components
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### California Prop. 65 Components
, which is/are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

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### SECTION 16: Other information

**Further information**
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 Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.12  Revision Date: 03/13/2023  Print Date: 12/02/2023