



HEXAMETHYLPHOSPHORIC TRIAMIDE (D18, 98%)

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830 and according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 15/07/2011

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Version: 4.0

DLM-3006

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

1.1. Product identifier

Product form	: Substance
Substance name	: HEXAMETHYLPHOSPHORIC TRIAMIDE (D18, 98%)
EC Index No	: 015-106-00-2 (Unlabeled)
EC No	: 211-653-8 (Unlabeled)
CAS No	: 680-31-9 (Unlabeled)
Product code	: DLM-3006
Formula	: [(CD3)2N]3PO
Synonyms	: HMPA / Hexamethylphosphoric acid triamide / Tris(dimethylamino)phosphine oxide

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

Main use category	: Professional use
Industrial/Professional use spec	: For professional use only

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Cambridge Isotope Laboratories, Inc.
50 Frontage Road
Andover, MA 01810
USA

USA: 1-800-322-1174 Int: 1-978-749-8000

cilsales@isotope.com www.isotope.com

Emergency telephone number

Emergency numbers:

Chemtrec: 1-800-424-9300 (24 hours)

International: 1-703-741-5970 (24 hours)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Muta. 1B H340

Carc. 1B H350

Full text of hazard classes and H-statements : see section 16

Classification according to Directive 67/548/EEC [DSD] or 1999/45/EC [DPD]

Carc.Cat.2; R45

Carc.Cat.2; R49

Muta.Cat.2; R46

Full text of R-phrases: see section 16

GHS-US classification

Muta. 1B H340

Carc. 1B H350

Full text of H statements : see section 16

Adverse physicochemical, human health and environmental effects

No additional information available

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2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :



GHS08

Signal word (CLP) :

Danger

Hazard statements (CLP) :

H340 - May cause genetic defects (in contact with skin, if inhaled, if swallowed)
H350 - May cause cancer (in contact with skin, if inhaled, if swallowed)

Precautionary statements (CLP) :

P280 - Wear protective clothing, protective gloves
P308+P313 - IF exposed or concerned: Get medical advice/attention
P405 - Store locked up
P501 - Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation

GHS-US labelling

Hazard pictograms (GHS-US) :



GHS08

Signal word (GHS-US) :

Danger

Hazard statements (GHS-US) :

H340 - May cause genetic defects (Dermal, Inhalation, oral)
H350 - May cause cancer (Dermal, Inhalation, oral)

Precautionary statements (GHS-US) :

P201 - Obtain special instructions before use
P202 - Do not handle until all safety precautions have been read and understood
P280 - Wear protective clothing, protective gloves
P308+P313 - If exposed or concerned: Get medical advice/attention
P405 - Store locked up
P501 - Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation

2.3. Other hazards

No additional information available

SECTION 3: Composition/information on ingredients

3.1. Substances

Name	Product identifier	%	Classification according to Directive 67/548/EEC
HEXAMETHYLPHOSPHORIC TRIAMIDE (D18, 98%)	(CAS No) 680-31-9 (Unlabeled) (EC No) 211-653-8 (Unlabeled) (EC Index No) 015-106-00-2 (Unlabeled)	100	Carc.Cat.2; R45 Carc.Cat.2; R49 Muta.Cat.2; R46

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
HEXAMETHYLPHOSPHORIC TRIAMIDE (D18, 98%)	(CAS No) 680-31-9 (Unlabeled) (EC No) 211-653-8 (Unlabeled) (EC Index No) 015-106-00-2 (Unlabeled)	100	Muta. 1B, H340 Carc. 1B, H350

Full text of R- and H-statements: see section 16

Name	Product identifier	%	GHS-US classification
HEXAMETHYLPHOSPHORIC TRIAMIDE (D18, 98%) (Main constituent)	(CAS No) 680-31-9 (Unlabeled)	100	Muta. 1B, H340 Carc. 1B, H350

Full text of H-statements: see section 16

3.2. Mixtures

Not applicable

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SECTION 4: First aid measures

4.1. Description of first aid measures

- First-aid measures general : If you feel unwell, seek medical advice (show the label where possible). Evacuate danger area.
- First-aid measures after inhalation : When symptoms occur: go into open air and ventilate suspected area. If not breathing, give artificial respiration. Get medical advice/attention.
- First-aid measures after skin contact : Wash with plenty of soap and water. Get immediate medical advice/attention.
- First-aid measures after eye contact : Rinse cautiously with water for several minutes.
- First-aid measures after ingestion : Never give anything by mouth to an unconscious person. Rinse mouth out with water. Get medical advice/attention.

4.2. Most important symptoms and effects, both acute and delayed

- Symptoms/injuries : May cause genetic defects (in contact with skin, if inhaled, if swallowed). May cause cancer (in contact with skin, if inhaled, if swallowed).
- Symptoms/injuries after inhalation : May be harmful if inhaled. May cause respiratory irritation.
- Symptoms/injuries after skin contact : May be harmful in contact with skin. May cause moderate irritation.
- Symptoms/injuries after eye contact : May cause eye irritation.
- Symptoms/injuries after ingestion : May be harmful if swallowed.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Fire-fighting measures

5.1. Extinguishing media

- Suitable extinguishing media : Water spray, dry chemical powder, alcohol-resistant foam, carbon dioxide (CO₂).

5.2. Special hazards arising from the substance or mixture

- Reactivity : Not available.

5.3. Advice for firefighters

- Firefighting instructions : Fight fire with normal precautions from a reasonable distance. Wear a self contained breathing apparatus. Do not enter fire area without proper protective equipment, including respiratory protection.
- Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection. Wear recommended personal protective equipment.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

- Emergency procedures : Use personal protective equipment as required. Avoid breathing vapours, mist, gas. Ensure adequate air ventilation. Evacuate unnecessary personnel. Avoid dust formation.

6.1.2. For emergency responders

- Protective equipment : Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent entry to sewers and public waters. Do not allow to enter drains or water courses. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

- For containment : Clean up any spills as soon as possible, using an absorbent material to collect it. Small quantities of liquid spill: take up in non-combustible absorbent material and shovel into container for disposal. For large spills, confine the spill in a dike and charge it with wet sand or earth for subsequent safe disposal.
- Methods for cleaning up : This material and its container must be disposed of in a safe way, and as per local legislation.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Additional hazards when processed : Avoid inhalation of vapours, mist.
- Precautions for safe handling : Provide adequate ventilation to minimize dust and/or vapour concentrations. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Eliminate all ignition sources if safe to do so.
- Hygiene measures : Handle in accordance with good industrial hygiene and safety practice. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

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7.2. Conditions for safe storage, including any incompatibilities

- Technical measures : Store in a well-ventilated place. Keep container tightly closed.
Storage conditions : Store at room temperature away from light and moisture.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

No additional information available

8.2. Exposure controls

- Appropriate engineering controls : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.
Personal protective equipment : Gloves. Protective clothing. Protective goggles. Self-contained breathing apparatus.



- Materials for protective clothing : Wear suitable protective clothing and gloves.
Hand protection : Wear suitable protective clothing and gloves.
Eye protection : Wear eye protection. Chemical goggles or face shield with safety glasses.
Skin and body protection : Wear suitable protective clothing, gloves and eye/face protection.
Respiratory protection : In case of inadequate ventilation wear respiratory protection. Approved supplied air respirator.
Environmental exposure controls : Avoid release to the environment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

- Physical state : Liquid
Appearance : Liquid.
Molecular mass : 197.31 g/mol (Labeled)
Colour : Colourless.
Odour : No data available
Odour threshold : No data available
pH : No data available
Relative evaporation rate (butylacetate=1) : No data available
Melting point : 7 °C (45 °F) - lit.
Freezing point : No data available
Boiling point : 230 - 232 (446 - 450 °F) at 987 hPa (740 mmHg) - lit.
Flash point : 144 °C (291 °F) - closed cup
Auto-ignition temperature : No data available
Decomposition temperature : No data available
Flammability (solid, gas) : No data available
Vapour pressure : No data available
Relative vapour density at 20 °C : 6.19 - (Air = 1.0)
Relative density : No data available
Density : 1.03 g/ml at 25 °C (77 °F)
Solubility : No data available
Log Pow : No data available
Log Kow : No data available
Viscosity, kinematic : No data available
Viscosity, dynamic : No data available
Explosive properties : No data available
Oxidising properties : No data available
Explosive limits : No data available

9.2. Other information

No additional information available

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SECTION 10: Stability and reactivity

10.1. Reactivity

Not available.

10.2. Chemical stability

Stable if stored under recommended conditions.

10.3. Possibility of hazardous reactions

No additional information available

10.4. Conditions to avoid

Not available.

10.5. Incompatible materials

Strong oxidizing agents. Strong acids.

10.6. Hazardous decomposition products

Toxic fumes are released. Oxides of phosphorus. Phosphine. Carbon oxides (CO, CO₂). Nitrogen oxides.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

HEXAMETHYLPHOSPHORIC TRIAMIDE (D18, 98%) (680-31-9 (Unlabeled))	
LD50 oral rat	2650 mg/kg Remarks: Behavioral: Convulsions or effect on seizure threshold. Kidney, Ureter, Bladder: Hematuria. Kidney, Ureter, Bladder: Incontinence.
LD50 dermal rabbit	2600 mg/kg Remarks: Behavioral: Altered sleep time (including change in righting reflex). Behavioral: Somnolence (general depressed activity). Lungs, Thorax, or Respiration: Dyspnea.

Skin corrosion/irritation	: Not classified
Serious eye damage/irritation	: Not classified
Respiratory or skin sensitisation	: Not classified
Germ cell mutagenicity	: Laboratory experiments have shown mutagenic effects. In vitro tests showed mutagenic effects.
Carcinogenicity	: This product is or contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, or EPA classification.
Reproductive toxicity	: Not classified
STOT-single exposure	: Not classified
STOT-repeated exposure	: Not classified
Aspiration hazard	: Not classified
Potential adverse human health effects and symptoms	: This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product. Liver - Irregularities - Based on Human Evidence.
IARC group	: 2B
Symptoms/injuries after inhalation	: May be harmful if inhaled. May cause respiratory irritation.
Symptoms/injuries after skin contact	: May be harmful in contact with skin. May cause moderate irritation.
Symptoms/injuries after eye contact	: May cause eye irritation.
Symptoms/injuries after ingestion	: May be harmful if swallowed.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : The product is not considered harmful to aquatic organisms nor to cause long-term adverse effects in the environment.

HEXAMETHYLPHOSPHORIC TRIAMIDE (D18, 98%) (680-31-9 (Unlabeled))	
LC50 fish 1	7240 mg/l <i>Lepomis macrochirus</i> (Bluegill) - 96 h
EC50 Daphnia 1	6670 mg/l <i>Daphnia magna</i> (Water flea) - 48 h

12.2. Persistence and degradability

No additional information available

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12.3. Bioaccumulative potential

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BCF fish 1	40.4 mg/l Cyprinodon variegatus (sheepshead minnow) - 33 d
Bioconcentration factor (BCF REACH)	3.3

12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

No additional information available

12.6. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

- Regional legislation (waste) : Waste materials should be disposed of under conditions which meet Federal, State, and Local environmental control regulations.
- Product/Packaging disposal recommendations: : Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.
- Ecology - waste materials : Dispose of as unused product.

SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

14.1. UN number

- UN-No.(DOT) : 3082
- DOT NA no. UN3082

14.2. UN proper shipping name

- Proper Shipping Name (DOT) : Environmentally hazardous substances, liquid, n.o.s.
- Class (DOT) : 9 - Class 9 - Miscellaneous hazardous material 49 CFR 173.140
- Hazard labels (DOT) : 9 - Class 9 (Miscellaneous dangerous materials)



- DOT Symbols : G - Identifies PSN requiring a technical name
- Packing group (DOT) : III - Minor Danger
- DOT Special Provisions (49 CFR 172.102) : 8 - A hazardous substance that is not a hazardous waste may be shipped under the shipping description "Other regulated substances, liquid or solid, n.o.s.", as appropriate. In addition, for solid materials, special provision B54 applies.
146 - This description may be used for a material that poses a hazard to the environment but does not meet the definition for a hazardous waste or a hazardous substance, as defined in 171.8 of this subchapter, or any hazard class as defined in Part 173 of this subchapter, if it is designated as environmentally hazardous by the Competent Authority of the country of origin, transit or destination.
173 - An appropriate generic entry may be used for this material.
335 - Mixtures of solids that are not subject to this subchapter and environmentally hazardous liquids or solids may be classified as "Environmentally hazardous substances, solid, n.o.s.," UN3077 and may be transported under this entry, provided there is no free liquid visible at the time the material is loaded or at the time the packaging or transport unit is closed. Each transport unit must be leakproof when used as bulk packaging.
IB3 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1 and 31HA2, 31HB2, 31HN2, 31HD2 and 31HH2). Additional Requirement: Only liquids with a vapor pressure less than or equal to 110 kPa at 50 C (1.1 bar at 122 F), or 130 kPa at 55 C (1.3 bar at 131 F) are authorized, except for UN2672 (also see Special Provision IP8 in Table 2 for UN2672).
T4 - 2.65 178.274(d)(2) Normal..... 178.275(d)(3)
TP1 - The maximum degree of filling must not exceed the degree of filling determined by the following: Degree of filling = $97 / (1 + a (tr - tf))$ Where: tr is the maximum mean bulk temperature during transport, and tf is the temperature in degrees celsius of the liquid during filling.
TP29 - A portable tank having a minimum test pressure of 1.5 bar (150.0 kPa) may be used provided the calculated test pressure is 1.5 bar or less based on the MAWP of the hazardous materials, as defined in 178.275 of this subchapter, where the test pressure is 1.5 times the MAWP.
- DOT Packaging Exceptions (49 CFR 173.xxx) : 155

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DOT Packaging Non Bulk (49 CFR 173.xxx) : 203
DOT Packaging Bulk (49 CFR 173.xxx) : 241

14.3. Additional information

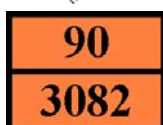
Other information : No supplementary information available.
Special transport precautions : Not dangerous goods.

Overland transport

Packing group (ADR) : III
Class (ADR) : 9 - Miscellaneous dangerous substances and articles
Hazard identification number (Kemler No.) : 90
Classification code (ADR) : M6
Danger labels (ADR) : 9 - Miscellaneous dangerous substances and articles



Orange plates :



Tunnel restriction code (ADR) : E
Limited quantities (ADR) : 5I
EAC code : •3Z
Excepted quantities (ADR) : E1

Transport by sea

DOT Vessel Stowage Location : A - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel.
MFAG-No : 171

Air transport

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : No limit
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : No limit
Civil Aeronautics Law : Miscellaneous dangerous substances & articles (Hazardous materials notice Appended Table 1 Article 194 of the Enforcement Regulations)

14.4. Environmental hazards

Other information : No supplementary information available.

14.5. Special precautions for user

Special transport precautions : Not dangerous goods.

14.6. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

SECTION 15: Regulatory information

15.1. US Federal regulations

HEXAMETHYLPHOSPHORIC TRIAMIDE (D18, 98%) (680-31-9 (Unlabeled))	
Subject to reporting requirements of United States SARA Section 313	
SARA Section 302 Threshold Planning Quantity (TPQ)	Not subject to reporting requirements of the United States SARA Section 302.
SARA Section 311/312 Hazard Classes	Delayed (chronic) health hazard

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15.2. International regulations

CANADA

HEXAMETHYLPHOSPHORIC TRIAMIDE (D18, 98%) (680-31-9 (Unlabeled))

Listed on the Canadian DSL (Domestic Substances List)

15.2.1. National regulations

No additional information available

15.3. US State regulations

HEXAMETHYLPHOSPHORIC TRIAMIDE (D18, 98%)(680-31-9 (Unlabeled))

U.S. - California - Proposition 65 - Carcinogens List	Yes
U.S. - California - Proposition 65 - Developmental Toxicity	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	Yes
State or local regulations	U.S. - Pennsylvania - RTK (Right to Know) List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Massachusetts - Right To Know List

SECTION 16: Other information

Other information : This product is not radioactive. The data given for this product are those of the corresponding unlabeled compound, unless specifically indicated otherwise. Health and safety data for labeled compounds are generally not available, but are assumed to be similar or identical to the corresponding unlabeled compound.

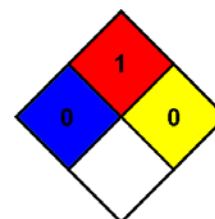
Full text of R-, H- and EUH-statements:

Carc. 1B	Carcinogenicity, Category 1B
Muta. 1B	Germ cell mutagenicity, Category 1B
H340	May cause genetic defects
H350	May cause cancer
R45	May cause cancer
R46	May cause heritable genetic damage
R49	May cause cancer by inhalation

NFPA health hazard : 0 - Materials that, under emergency conditions, would offer no hazard beyond that of ordinary combustible materials.

NFPA fire hazard : 1 - Materials that must be preheated before ignition can occur.

NFPA reactivity : 0 - Material that in themselves are normally stable, even under fire conditions.



HMIS III Rating

Health : 1 Slight Hazard - Irritation or minor reversible injury possible

Flammability : 1 Slight Hazard

Physical : 0 Minimal Hazard

CIL Multi-Solvent Mixture SDS

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product