SAFETY DATA SHEET

1. Identification

Product identifier Metasystox I (TM)
Other means of identification
   Item N-12384
   Synonyms DEMETON S-METHYL * S-[2-(Ethylthio)ethyl]O,O-dimethyl ester phosphorothioic acid
Recommended use For Laboratory Use Only
Recommended restrictions None known.
Manufacturer/Importer/Supplier/Distributor information
Manufacturer
   Company name Chem Service, Inc.
   Address 660 Tower Lane
   West Chester, PA 19380
   United States
   Telephone Toll Free 800-452-9994
   Direct 610-692-3026
   Website www.chemservice.com
   E-mail info@chemservice.com
   Emergency phone number Chemtrec US 800-424-9300
   Chemtrec outside US +1 703-527-3887

2. Hazard(s) identification

Physical hazards Not classified.
Health hazards
   Acute toxicity, oral Category 2
   Acute toxicity, dermal Category 1
   Acute toxicity, inhalation Category 1
Environmental hazards
   Hazardous to the aquatic environment, acute hazard Category 1
   Hazardous to the aquatic environment, long-term hazard Category 1
OSHA defined hazards Not classified.
Label elements

Signal word Danger
Hazard statement Fatal if swallowed. Fatal in contact with skin. Fatal if inhaled. Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects.
Precautionary statement
   Prevention
   Response
   Storage
   Disposal

Material name: Metasystox I (TM)
Hazard(s) not otherwise classified (HNOC)  None known.
Supplemental information  Not applicable.

3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Substances</th>
<th>Chemical name</th>
<th>Common name and synonyms</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metasystox I (TM)</td>
<td>DEMETON S-METHYL</td>
<td>S-[2-(Ethylthio)ethyl]O,O-dimethyl ester phosphorothioic acid</td>
<td>919-86-8</td>
<td>100</td>
</tr>
</tbody>
</table>

4. First-aid measures

**Inhalation**
Remove victim to fresh air and keep at rest in a position comfortable for breathing. Oxygen or artificial respiration if needed. Do not use mouth-to-mouth method if victim inhaled the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Call a physician or poison control center immediately.

**Skin contact**
Take off immediately all contaminated clothing. IF ON SKIN: Gently wash with plenty of soap and water. Call a physician or poison control center immediately.

**Eye contact**
Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician or poison control center immediately.

**Ingestion**
Call a physician or poison control center immediately. Rinse mouth. Do not induce vomiting without advice from poison control center. If vomiting occurs, keep head low so that stomach content doesn’t get into the lungs. Do not use mouth-to-mouth method if victim ingested the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

**Most important symptoms/effects, acute and delayed**
Direct contact with eyes may cause temporary irritation.

**Indication of immediate medical attention and special treatment needed**
Provide general supportive measures and treat symptomatically. In case of shortness of breath, give oxygen. Keep victim warm. Keep victim under observation. Symptoms may be delayed.

**General information**
Take off immediately all contaminated clothing. In the case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Wash contaminated clothing before reuse. Discard any shoes or clothing items that cannot be decontaminated.

5. Fire-fighting measures

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

**Unsuitable extinguishing media**
Do not use water jet as an extinguisher, as this will spread the fire.

**Specific hazards arising from the chemical**
During fire, gases hazardous to health may be formed.

**Special protective equipment and precautions for firefighters**
Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

**Fire fighting equipment/instructions**
Move containers from fire area if you can do so without risk.

**Specific methods**
Use standard firefighting procedures and consider the hazards of other involved materials.

**General fire hazards**
No unusual fire or explosion hazards noted.

6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures**
Immediately evacuate personnel to safe areas. Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Keep out of low areas. Wear appropriate protective equipment and clothing during clean-up. Do not breathe vapor. Fully encapsulating, vapor protective clothing should be worn for spills and leaks with no fire. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
This material is classified as a water pollutant under the Clean Water Act and should be prevented from contaminating soil or from entering sewage and drainage systems which lead to waterways.

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Absorb in vermiculite, dry sand or earth and place into containers. Use water spray to reduce vapors or divert vapor cloud drift. Following product recovery, flush area with water.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.

Environmental precautions
Avoid release to the environment. Contact local authorities in case of spillage to drain/aquatic environment. Prevent further leakage or spillage if safe to do so. Do not contaminate water. Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling
Do not breathe vapor. Do not get this material in contact with eyes. Do not get this material in contact with skin. Do not taste or swallow. Avoid prolonged exposure. Do not get this material on clothing. Use only outdoors or in a well-ventilated area. Wear appropriate personal protective equipment. Observe good industrial hygiene practices. When using, do not eat, drink or smoke. Wash hands thoroughly after handling. Wash contaminated clothing before reuse. Avoid release to the environment. Do not empty into drains.

Conditions for safe storage, including any incompatibilities
Store locked up. Store in original tightly closed container. Store in a well-ventilated place. Store away from incompatible materials (see Section 10 of the SDS). Store in freezer (<0 °C).

8. Exposure controls/personal protection

Occupational exposure limits

<table>
<thead>
<tr>
<th>Material</th>
<th>Form</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metasystox I (TM) (CAS</td>
<td>Inhalable fraction and</td>
<td>TWA</td>
<td>0.05 mg/m³</td>
</tr>
<tr>
<td>919-86-8)</td>
<td>vapor.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>US. NIOSH: Pocket Guide to Chemical Hazards</td>
<td></td>
<td>TWA</td>
<td>0.5 mg/m³</td>
</tr>
<tr>
<td>Metasystox I (TM) (CAS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>919-86-8)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Biological limit values
No biological exposure limits noted for the ingredient(s).

Exposure guidelines

US - California OELs: Skin designation
Metasystox I (TM) (CAS 919-86-8) Can be absorbed through the skin.

US - Minnesota Haz Subs: Skin designation applies
Metasystox I (TM) (CAS 919-86-8) Skin designation applies.

US - Tennessee OELs: Skin designation
Metasystox I (TM) (CAS 919-86-8) Can be absorbed through the skin.

US ACGIH Threshold Limit Values: Skin designation
Metasystox I (TM) (CAS 919-86-8) Can be absorbed through the skin.

US NIOSH Pocket Guide to Chemical Hazards: Skin designation
Metasystox I (TM) (CAS 919-86-8) Can be absorbed through the skin.

Appropriate engineering controls
Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Individual protection measures, such as personal protective equipment

Eye/face protection Wear eye/face protection. Wear safety glasses with side shields (or goggles).

Skin protection Wear protective gloves.

Hand protection Wear appropriate chemical resistant clothing.

Other Wear positive pressure self-contained breathing apparatus (SCBA).

Respiratory protection Wear appropriate thermal protective clothing, when necessary.
When using, do not eat, drink or smoke. Do not get this material on clothing. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance
- Physical state: Liquid.
- Form: Liquid
- Color: Pale yellow

Odor
- Odor threshold: Not available.
- pH: Not available.

Melting point/freezing point
- Melting point/freezing point: -104.8 °F (-76 °C)

Initial boiling point and boiling range
- Initial boiling point and boiling range: 244.4 °F (118 °C) at 1mm Hg

Flash point
- Flash point: Not available.

Evaporation rate
- Evaporation rate: Not available.

Flammability (solid, gas)
- Flammability limit - lower: Not available.
- Flammability limit - upper: Not available.
- Explosive limit - lower: Not available.
- Explosive limit - upper: Not available.

Vapor pressure
- Vapor pressure: 0.00004 kPa at 20 °C
- 40 mPa at 20 °C

Vapor density
- Vapor density: Not available.

Relative density
- Relative density: Not available.

Solubility(ies)
- Solubility (water): 0.3 - 3 g/l

Partition coefficient (n-octanol/water)
- Partition coefficient: 1.02

Auto-ignition temperature
- Auto-ignition temperature: Not available.

Decomposition temperature
- Decomposition temperature: Not available.

Viscosity
- Viscosity: Not available.

Other information
- Density: 1.2069 g/cm3 estimated
- Molecular formula: C6-H15-O3-P-S2
- Molecular weight: 230.3 g/mol
- Specific gravity: 1.21 at 20 °C

10. Stability and reactivity

Reactivity
- The product is stable and non-reactive under normal conditions of use, storage and transport.

Chemical stability
- Material is stable under normal conditions.

Possibility of hazardous reactions
- Hazardous polymerization does not occur.

Conditions to avoid
- Contact with incompatible materials.

Incompatible materials
- Strong oxidizing agents.

Hazardous decomposition products
- No hazardous decomposition products are known.
11. Toxicological information

Information on likely routes of exposure

Inhalation  Fatal if inhaled.

Skin contact  Fatal in contact with skin.

Eye contact  Direct contact with eyes may cause temporary irritation.

Ingestion  Fatal if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics

Direct contact with eyes may cause temporary irritation.

Information on toxicological effects

Acute toxicity  Fatal if inhaled. Fatal in contact with skin. Fatal if swallowed.

<table>
<thead>
<tr>
<th>Product</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metasystox I (TM) (CAS 919-86-8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dermal</td>
<td>Rat</td>
<td>45 mg/kg</td>
</tr>
<tr>
<td>LD50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inhalation</td>
<td>Rat</td>
<td>0.21 mg/l, 4 Hours</td>
</tr>
<tr>
<td>LC50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral</td>
<td>Guinea pig</td>
<td>110 mg/kg</td>
</tr>
<tr>
<td>LD50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rat</td>
<td>30 mg/kg</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>Guinea pig</td>
<td>12.5 mg/kg</td>
</tr>
<tr>
<td>LD50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mouse</td>
<td>0.5 mg/kg</td>
<td></td>
</tr>
<tr>
<td>Rat</td>
<td>7.5 mg/kg</td>
<td></td>
</tr>
</tbody>
</table>

* Estimates for product may be based on additional component data not shown.

Skin corrosion/irritation  Prolonged skin contact may cause temporary irritation.

Serious eye damage/eye irritation  Direct contact with eyes may cause temporary irritation.

Respiratory or skin sensitization

ACGIH Sensitization

Metasystox I (TM) (CAS 919-86-8)  Dermal sensitization

Respiratory sensitization  Not available.

Skin sensitization  This product is not expected to cause skin sensitization.

Germ cell mutagenicity  No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity  This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

IARC Monographs. Overall Evaluation of Carcinogenicity  Not available.

US. National Toxicology Program (NTP) Report on Carcinogens  Not available.


Reproductive toxicity  This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity - single exposure  Not classified.

Specific target organ toxicity - repeated exposure  Not classified.

Aspiration hazard  Not available.

Chronic effects  Prolonged inhalation may be harmful.
12. Ecological information

Ecotoxicity

Very toxic to aquatic life with long lasting effects. Accumulation in aquatic organisms is expected.

<table>
<thead>
<tr>
<th>Product</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metasystox I (TM) (CAS 919-86-8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Aquatic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fish</td>
<td>LC50</td>
<td>Carp, hawk fish (Cirrhinus mrigala) 1.24 mg/l, 96 hours</td>
</tr>
</tbody>
</table>

* Estimates for product may be based on additional component data not shown.

Persistence and degradability

No data is available on the degradability of this product.

Bioaccumulative potential

Not available.

Partition coefficient n-octanol / water (log Kow)

1.02

Mobility in soil

No data available.

Other adverse effects

No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions

Collect and reclaim or dispose in sealed containers at licensed waste disposal site. This material and its container must be disposed of as hazardous waste. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations

Dispose in accordance with all applicable regulations.

Hazardous waste code

The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products

Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging

Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

UN number: UN3278
UN proper shipping name: Organophosphorus compound, toxic, liquid, n.o.s.
Class: 6.1 (PGI, II)
Subsidiary risk: -
Label(s): 6.1
Packing group: II
Environmental hazards: Yes
Marine pollutant: Yes
Special precautions for user: Read safety instructions, SDS and emergency procedures before handling.
Special provisions: IB2, T11, TP2, TP27
Packaging exceptions: 153
Packaging non bulk: 202
Packaging bulk: 243

IATA

UN number: UN3278
UN proper shipping name: Organophosphorus compound, liquid, toxic, n.o.s.
Class: 6.1 (PGI, II)
Subsidiary risk: -
Packing group: II
Environmental hazards: No.
ERG Code: 6L
Special precautions for user: Read safety instructions, SDS and emergency procedures before handling.
Other information

Passenger and cargo aircraft
Allowed.

Cargo aircraft only
Allowed.

IMDG

UN number
UN3278

UN proper shipping name
ORGANOPHOSPHORUS COMPOUND, TOXIC, LIQUID, N.O.S.

Transport hazard class(es)

Class
6.1(PGI, II)

Subsidiary risk
-

Packing group
II

Environmental hazards

Marine pollutant
Yes

EmS
F-A, S-A

Special precautions for user

Read safety instructions, SDS and emergency procedures before handling.

Not available.

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

DOT

IATA; IMDG

Marine pollutant

General information

DOT Regulated Marine Pollutant. IMDG Regulated Marine Pollutant.

15. Regulatory information

US federal regulations
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
Not regulated.
CERCLA Hazardous Substance List (40 CFR 302.4)
Not listed.

SARA 304 Emergency release notification
Metasystox I (TM) (CAS 919-86-8) 500 LBS

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)
Not listed.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories
Immediate Hazard - Yes
Delayed Hazard - No
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS number</th>
<th>Reportable quantity</th>
<th>Threshold planning quantity</th>
<th>Threshold planning quantity, lower value</th>
<th>Threshold planning quantity, upper value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metasystox I (TM)</td>
<td>919-86-8</td>
<td>500</td>
<td>500 lbs</td>
<td></td>
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</tr>
</tbody>
</table>

SARA 311/312 Hazardous chemical

SARA 313 (TRI reporting)
Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List
Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)
Not regulated.

Safe Drinking Water Act (SDWA)
Not regulated.

US state regulations

US - New Jersey RTK - Substances: Listed substance
Metasystox I (TM) (CAS 919-86-8)

US. California Controlled Substances. CA Department of Justice (California Health and Safety Code Section 11100)
Not listed.

US. Massachusetts RTK - Substance List
Metasystox I (TM) (CAS 919-86-8)

US. New Jersey Worker and Community Right-to-Know Act
Metasystox I (TM) (CAS 919-86-8)

US. Pennsylvania RTK - Hazardous Substances
Metasystox I (TM) (CAS 919-86-8)

US. Pennsylvania Worker and Community Right-to-Know Law
Metasystox I (TM) (CAS 919-86-8)

US. Rhode Island RTK
Metasystox I (TM) (CAS 919-86-8)

US. California Proposition 65
California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

International Inventories

<table>
<thead>
<tr>
<th>Country(s) or region</th>
<th>Inventory name</th>
<th>On inventory (yes/no)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Australian Inventory of Chemical Substances (AICS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Domestic Substances List (DSL)</td>
<td>No</td>
</tr>
<tr>
<td>Canada</td>
<td>Non-Domestic Substances List (NDSL)</td>
<td>Yes</td>
</tr>
<tr>
<td>China</td>
<td>Inventory of Existing Chemical Substances in China (IECSC)</td>
<td>No</td>
</tr>
<tr>
<td>Europe</td>
<td>European Inventory of Existing Commercial Chemical Substances (EINECS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European List of Notified Chemical Substances (ELINCS)</td>
<td>No</td>
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<tr>
<td>Japan</td>
<td>Inventory of Existing and New Chemical Substances (ENCS)</td>
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</tr>
</tbody>
</table>

Material name: Metasystox I (TM)
SDS US
N-12384    Version #: 04    Revision date: 03-01-2017    Issue date: 09-15-2014

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<table>
<thead>
<tr>
<th>Country(s) or region</th>
<th>Inventory name</th>
<th>On inventory (yes/no)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Korea</td>
<td>Existing Chemicals List (ECL)</td>
<td>Yes</td>
</tr>
<tr>
<td>New Zealand</td>
<td>New Zealand Inventory</td>
<td>No</td>
</tr>
<tr>
<td>Philippines</td>
<td>Philippine Inventory of Chemicals and Chemical Substances (PICCS)</td>
<td>No</td>
</tr>
<tr>
<td>United States &amp; Puerto Rico</td>
<td>Toxic Substances Control Act (TSCA) Inventory</td>
<td>Yes</td>
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</table>

*A “Yes” indicates that all components of this product comply with the inventory requirements administered by the governing country(s)*

A “No” indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

<table>
<thead>
<tr>
<th>Issue date</th>
<th>09-15-2014</th>
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<tbody>
<tr>
<td>Revision date</td>
<td>03-01-2017</td>
</tr>
<tr>
<td>Version #</td>
<td>04</td>
</tr>
<tr>
<td>NFPA ratings</td>
<td>Health: 4</td>
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<tr>
<td></td>
<td>Flammability: 0</td>
</tr>
<tr>
<td></td>
<td>Instability: 0</td>
</tr>
</tbody>
</table>

Disclaimer

The above information is believed to be correct on the date it was last revised and must not be considered all inclusive. The information has been obtained only by a search of available literature and is only a guide for handling the chemicals. OSHA regulations require that if other hazards become evident, an upgraded SDS must be made available to the employee within three months. RESPONSIBILITY for updates lies with the employer and not with CHEM SERVICE, Inc.

Persons not specifically and properly trained should not handle this chemical or its container. This product is furnished FOR LABORATORY USE ONLY! Our products may NOT BE USED as drugs, cosmetics, agricultural or pesticide products, food additives or as household chemicals.

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