

## MATERIAL SAFETY DATA SHEET

### SECTION 1 — PRODUCT AND COMPANY IDENTIFICATION

**Product identifier:** CYGON™ 480, CYGON™ 480-AG, CYGON™ 480-ORN

**Product use:** Insecticide.

**PMRA Registration No.:** 8277, 25651, 25650

**Supplier's name and address:**

***Cheminova Canada Inc.***

22499 Jefferies Road, Unit C2,

Kilworth, ON,

Canada N0L 1R0

Phone #: 1-(519)-472-0600 (8 AM to 4:00 PM EST, Monday to Friday)

**Emergency Telephone #:** 1-866-303-6950 (Medical Emergencies)

1-(613)-996-6666 (CANUTECH)

**MSDS Prepared by:** Cheminova Inc.

**MSDS Preparation date:** April 17, 2006

**Revision date:** November 11, 2013

**Revision reason:** 3-year cycle update

### SECTION 2 — COMPOSITION/INFORMATION ON INGREDIENTS

<u>Ingredients</u>	<u>CAS #</u>	<u>% (weight)</u>	<u>ACGIH TLV</u>	<u>OSHA PEL</u>
Dimethoate	60-51-5	30 - 60	N/Av	N/Av
Cyclohexanone	108-94-1	15 - 40	20 ppm (skin)	50 ppm
Aromatic solvent naphtha	64742-94-5	7 - 13	N/Av	N/Av
1,2,4-Trimethylbenzene	95-63-6	3 - 7	25 ppm (As 'Trimethylbenzene mixed isomers')	N/Av
Nonylphenol polyethylene glycol ether	127087-87-0	1 - 5	N/Av	N/Av

This material is classified as hazardous under OSHA regulations (29CFR 1910.1200).

### SECTION 3 — HAZARDS IDENTIFICATION

#### EMERGENCY OVERVIEW

Colorless to slightly yellow liquid, mercaptanic / acetone odor.

Warning! Combustible liquid and vapor. Dangerous exothermic decomposition may occur at temperatures greater than 176°F / 80°C. Harmful if inhaled. Harmful or fatal if swallowed. Can enter lungs and cause damage. Causes skin and eye irritation. Contains a material which can cause nervous system damage. May be dangerous for the environment. This product is toxic to wildlife and aquatic invertebrates, and highly toxic to bees.

In case of fire, use water fog, dry chemical, CO<sub>2</sub> or 'alcohol' foam. Water may be ineffective.

#### \*\*\*POTENTIAL HEALTH EFFECTS\*\*\*

**Target organs:** Eyes, skin, respiratory system, digestive system, nervous system.

**Signs and symptoms of short-term (acute) exposure:**

- Inhalation:** Dimethoate is a dangerous poison through inhalation. This material can cause organophosphorous poisoning. Symptoms of poisoning may include headache, nausea, vomiting, blurred vision, tightness in chest, drooling and frothing of mouth and nose, pulmonary edema (fluid accumulation), cyanosis (bluish discoloration of skin) convulsions, coma and death.
- Skin contact:** Direct skin contact may cause moderate to severe irritation. Dimethoate can be rapidly absorbed through all skin surfaces and cause symptoms similar to those listed for inhalation.
- Eye contact:** Direct eye contact may cause severe irritation. Dimethoate can be rapidly absorbed through all skin and eye surfaces and cause symptoms similar to those listed for inhalation.

Revision Date: November 11, 2013

**Ingestion:** Dimethoate is a dangerous poison through ingestion. Causes symptoms similar to those listed for inhalation. This product may present an aspiration hazard. Aspiration into the lungs can cause life-threatening lung injury.

**Effects of long-term (chronic) exposure:** Prolonged or repeated overexposure may cause behavioural changes. Prolonged or repeated skin contact can cause drying and cracking of the skin (dermatitis). Prolonged or repeated overexposure may cause liver, kidney and blood system effects.

**Carcinogenicity:** See TOXICOLOGICAL INFORMATION (Section 11).

**Other important hazards:** Cholinesterase inhibitor. May cause Central Nervous System depression. May cause damage to the peripheral nervous system. See TOXICOLOGICAL INFORMATION (Section 11).

**Potential environmental effects:** This product is toxic to wildlife and aquatic invertebrates, and highly toxic to bees. See ECOLOGICAL INFORMATION (Section 12).

## SECTION 4 — FIRST AID MEASURES

**Inhalation:** Immediately remove victim to fresh air. If breathing has stopped, begin artificial respiration immediately. Transport to a clinic or hospital immediately.

**Skin:** Immediately flush skin with running water for at least 20 minutes, while removing contaminated clothing and shoes. Obtain medical attention immediately. Thoroughly clean contaminated clothing before re-use.

**Eyes:** Immediately flush eyes with running water for at least 20 minutes. Get medical attention immediately.

**Ingestion: Call a physician or poison control center immediately!** If ingested, induce vomiting immediately, but only as directed by qualified medical personnel. Never give anything by mouth if victim is unconscious or convulsing. Transport to a clinic or hospital immediately.

**Note to physician:** Dimethoate is a cholinesterase inhibitor affecting the central and peripheral nervous systems and producing respiratory depression. Decontamination procedures such as whole body washing, gastric lavage and administration of activated charcoal are often required. If symptoms are present, administer atropine sulphate in large doses. Two to four mg intravenously or intramuscularly as soon as cyanosis is overcome. Repeat at 5 to 10 minute intervals until signs of atropinization appear. Maintain full atropinization until all organophosphate is metabolised. Pralidoxime chloride (2-PAM), may be administered as an adjunct to, but not a substitute for atropine, which is a symptomatic and often life-saving antidote. At first sign of pulmonary edema, the patient should be given supplemental oxygen and treated symptomatically. Continued absorption of Dimethoate may occur and relapse may occur after initial improvement. VERY CLOSE SUPERVISION OF THE PATIENT IS INDICATED FOR AT LEAST 48 HOURS, DEPENDING ON THE SEVERITY OF POISONING.

## SECTION 5 — FIRE FIGHTING MEASURES

**Fire hazards/conditions of flammability:** Flammable liquid and vapor. Material will burn when exposed to heat, flame and other ignition sources. Material may decompose rapidly when exposed to heat and flame. Heat of decomposition may cause closed containers to build up pressure and explode.

**Flammability classification (OSHA 29 CFR 1910.1200):** Class II Combustible Liquid.

**Flash point (Method):** 108°F (42°C) (Pensky Martens Closed Cup)

**Flammable limits (% by volume):** 1.3 – 9.4 (Cyclohexanone)  
1.9 – 12.6 @ 77°F / 25°C (Aromatic solvent naphtha).

**Explosion data:** *Sensitivity to mechanical impact:* Not sensitive.

*Sensitivity to static discharge:* Not expected to be sensitive to static discharge.

**Auto-ignition temperature:** 788°F / 420°C (Cyclohexanone)

~ 880°F / 470°C (Aromatic solvent naphtha)

**Suitable extinguishing media:** For small fires, use dry chemical or carbon dioxide. For large fires, use water spray or foam. Do not use water jet, as this may spread the fire.

**Special fire-fighting procedures/equipment:** Firefighters should wear proper chemically protective equipment and self-contained breathing apparatus operated in positive pressure mode. Move containers from fire area if it can be done without risk. Dike area to prevent water run-off. Water spray may be useful in cooling equipment and containers.

**Hazardous combustion products:** Carbon oxides, nitrogen oxides, phosphorous oxides, sulfur oxides, dimethyl sulfide and other irritating fumes and smoke.

## SECTION 6 — ACCIDENTAL RELEASE MEASURES

**Personal precautions:** Restrict access to area until completion of clean-up. Ensure clean-up is conducted by trained personnel only. All persons dealing with clean-up should wear the appropriate chemically protective equipment. Refer to Section

Revision Date: November 11, 2013

8, EXPOSURE CONTROLS AND PERSONAL PROTECTION, for additional information on acceptable personal protective equipment.

**Environmental precautions:** Ensure spilled product does not enter drains, sewers, waterways, or confined spaces.

**Spill response/Cleanup:** Eliminate all sources of heat, sparks and flame. Ventilate area of release. Stop leak if you can do so without risk. Notify the appropriate authorities. For spills on the floor or other impervious surfaces, absorb spill with inert, non-combustible absorbent material, such as hydrated lime, Fuller's earth or other absorbent clays. Scoop up and place contaminated absorbent material into suitable containers for later disposal (see Section 13). Rinse spill area with soda lye. Do not flush to sewer or allow to enter confined spaces. Large spills should be contained or diked using inert, non-combustible absorbent material. Large spills that soak into the ground should be dug up, placed in suitable containers and disposed of appropriately (see Section 13).

**Prohibited materials:** None known.

**Special spill response procedures:** If a spill/release in excess of EPA reportable quantity is made into the environment, immediately notify the national response center (phone: 1-800-424-8002).

EPA/CERCLA Reportable quantity: **Dimethoate** (RQ 10 lbs.); **Cyclohexanone** (RQ 5000 lbs.).

## SECTION 7 — HANDLING AND STORAGE

**Safe handling procedures:** This material is a toxic liquid. Wear full chemically protective equipment during handling. Use only in well ventilated area. Avoid all contact with eyes, skin and clothing. Do not inhale vapors or mists. Keep away from all unprotected persons and children. Do not use near sources of heat, flame or ignition sources. **Dimethoate should never be heated above 95°F / 35°C. Heat only indirectly and with solvent present. Local heating with, for example electric heating equipment or steam, may significantly increase the risk of explosion and should never take place.** Keep away from bases and incompatibles. Use caution when opening containers. Keep container tightly closed when not in use. Wash thoroughly after handling.

**Storage recommendations:** Store in a cool (<77°F / 25°C), dry, well ventilated area away from incompatibles. Protect container from physical damage. No smoking in the area. Inspect containers periodically for damage or leaks.

**Special packaging materials:** Always keep in containers made of the same materials as the supply container.

## SECTION 8 — EXPOSURE CONTROLS AND PERSONAL PROTECTION

**Permissible exposure levels:** See Section 2.

**Ventilation and engineering controls:** If handled indoors, provide mechanical exhaust ventilation to keep concentrations below specified TLV's and PEL's.

**Respiratory protection:** Respiratory protection is required. Wear a pesticide respirator jointly approved by the MSHA and NIOSH. Advice should be sought from respiratory protection specialists.

**Protective gloves:** Wear impervious chemical gloves, such as barrier laminate, butyl rubber, nitrile rubber or viton. Advice should be sought from glove suppliers.

**Eye protection:** Wear chemical splash goggles to prevent splashes from entering the eyes.

**Other protective equipment:** Wear impervious chemical apron and protective clothing (water-proof pants, coat, hat or rubber boots) to prevent skin contact. Other protective equipment, such as an eyewash station and safety shower, may be required depending on exposure and on workplace standards.

**General hygiene considerations:** Do not breathe vapors or mists. Avoid contact all contact with eyes, skin and clothing. Before removing gloves, wash them with soap and water. Always wash hands, face and arms with soap and water before smoking, eating or drinking. After work, take off all protective equipment, work clothes and shoes, and wash with soap and water. Respirator should be cleaned and filter replaced according to manufacturer's instructions. Wear only clean, uncontaminated clothes when leaving place of work. Persons working with this product for a longer period should have frequent blood tests for cholinesterase levels. If the cholinesterase levels fall below a critical point, no further exposure should be allowed until it has been determined, by means of blood tests, that cholinesterase levels have returned to normal.

## SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

**Physical state, odor and appearance:** Colorless to slightly yellow liquid, mercaptanic / acetone odor.

**Odor threshold:** N/Av

**Specific gravity (water = 1):** 1.09 – 1.11 @ 77°F/25°C

**Solubility in water:** This product is emulsifiable in water.

**pH:** N/Av.

**Boiling point:** Dimethoate: Decomposes at temperatures above 176°F (80°C).  
Cyclohexanone: 316°F / 156°C

Revision Date: November 11, 2013

Aromatic solvent naphtha: 318-338°F / 159-170°C

**Melting/freezing point:** < 41°F / 5°C.

**Vapour density (Air=1.0):** N/Av

**Percent Volatile by Weight:** N/Av

**Evaporation rate (n-BuAc=1.0):** N/Av

**Vapour pressure:** Dimethoate:  $1.85 \times 10^{-6}$  mmHg @ 77°F / 25°C.

Cyclohexanone: 3.5 mmHg @ 68°F / 20°C

Aromatic solvent naphtha: ~ 4 mmHg @ 68°F / 20°C

**Viscosity:** 5 – 10 centipoise @ 77°F / 25°C

**Coefficient of n-Octanol/water distribution:**  $\log K_{ow} = 0.704$  (Dimethoate)

## SECTION 10 — REACTIVITY AND STABILITY DATA

**Stability and reactivity:** Stable if handled below 77°F / 25°C. At higher temperatures decomposition will take place and lower the quality of the product. The released heat from decomposition can raise the temperature further and accelerate decomposition. Dimethoate can corrode iron, steel, tin plate, lead and copper. It is rapidly hydrolysed at pH > 8.0. This product may form peroxides in air and direct sunlight.

**Hazardous polymerization:** It is strongly advised to heat product indirectly. Above 176°F / 80°C Dimethoate will decompose rapidly, significantly increasing the risk of inducing explosions. The decomposition is to a considerable extent dependant on time as well as temperature due to exothermic and autocatalytic reactions. The reactions involve rearrangements and polymerization, releasing volatile malodorous and inflammable compounds such as dimethyl sulfide and methyl mercaptan.

**Conditions to avoid:** Avoid heat, flame and direct sunlight.

**Materials to avoid (incompatibles):** Strong oxidizing agents, alkalies, amines.

**Hazardous decomposition products:** Dimethyl sulfide and methyl mercaptan. Refer also to 'Hazardous combustion products', Section 5.

## SECTION 11 — TOXICOLOGICAL INFORMATION

**Routes of exposure:** Skin contact, skin absorption, eye contact, inhalation, and ingestion.

**Toxicological data:**  $LC_{50}$  (mg/L/4 hrs) = 2.5 \*

$LD_{50}$ , oral, rat (mg/kg) = 450 \*

$LD_{50}$ , dermal, rat (mg/kg) = >2000 \*

(\* estimated values based on measurements on a similar product).

**Carcinogenicity:** Contains Cyclohexanone. Cyclohexanone is classified as a confirmed animal carcinogen with unknown relevance to humans by the ACGIH (Category A3). None of the other ingredients in this product are classified as carcinogenic by IARC, ACGIH, OSHA or NTP.

**Teratogenicity, mutagenicity, other reproductive effects:** Contains Dimethoate. Dimethoate is mutagenic in bacterial tests, but not in mammalian cells or in *in vivo* tests. No known teratogenic or reproductive effects.

**Sensitization to material:** None known.

**Synergistic materials:** Not available.

**Conditions aggravated by exposure:** Repeated exposures to cholinesterase inhibitors, such as Dimethoate, may without warning cause increased susceptibility to doses of any cholinesterase inhibitor.

## SECTION 12 — ECOLOGICAL INFORMATION

**Ecotoxicological information:** The product should not be allowed to enter drains or water courses or be deposited where it can affect ground or surface waters. Do not discharge product unmonitored into the environment. This product is an insecticide and is toxic to wildlife and aquatic invertebrates. It is highly toxic to bees. The acute toxicity of the active ingredient, Dimethoate, is measured to be:

Fish – 96-Hr  $LC_{50}$ , Rainbow trout (*Salmo gairdneri*) = 30.2 ppm.

Invertebrates – 48-Hr  $EC_{50}$ , Daphnids (*Daphnia magna*) = 2.5 ppm.

Birds –  $LD_{50}$ , Mallard duck (male), acute oral = 41.7 mg/kg.

Bees - 24-Hr  $LD_{50}$ , Bees, topical = 0.12 µg/bee.

24-Hr  $LD_{50}$ , Bees, oral = 0.15 µg/bee

**Mobility:** The active ingredient, Dimethoate, has a potentially high mobility in soil, but is relatively unstable. Degradation products are not mobile in soil.

Revision Date: November 11, 2013

**Persistence and degradability:** The active ingredient in this product, Dimethoate, is biodegradable. It undergoes rapid degradation in the environment and, without problems, in waste water treatment plants. No adverse effects are observed at concentrations up to 100 mg/L in waste water treatment plants. Degradation occurs both aerobically and anaerobically, and biologically as well as abiologically.

**Bioaccumulative potential:** The active ingredient, Dimethoate, is not considered to have a bioaccumulative potential. The bioaccumulation factor of Dimethoate was estimated to be 2 for fish (measured on carp).

## SECTION 13 — DISPOSAL CONSIDERATIONS

**Handling for disposal:** Handle waste according to recommendations in Section 7.

**Methods of disposal:** Do not contaminate water, foodstuffs, feed or seed by storage or disposal. For refillable containers, after use, return to Manufacturer. Containers holding this product may only be refilled with CYGON™ 480. Do not reuse containers for any other purpose. Prior to refilling, inspect thoroughly for damage, such as cracks, punctures and abrasions and damaged or worn out thread on closure devices. Do not refill or transport damaged or leaking containers. For disposable containers, triple rinse (or equivalent) containers, and add rinse material to the tank. Follow any additional local, state or federal requirements for cleaning containers prior to disposal. Make the empty, rinsed container unsuitable for further use. Dispose of at any EPA approved facility or dispose of in compliance with all Federal, State and local regulations. Contact your local, state or federal environmental agency for specific rules.

**RCRA:** If this product, as supplied, becomes a waste, it may meet the criteria of a hazardous waste as defined under RCRA, Title 40 CFR 261. It is the responsibility of the waste generator to determine the proper waste identification and disposal method. For disposal of unused or waste material, check with local, state and federal environmental agencies.

## SECTION 14 — TRANSPORTATION INFORMATION

### US 49 CFR information:

*Proper Shipping Name:* Organophosphorous pesticides, liquid, toxic, flammable, n.o.s. (Dimethoate, Cyclohexanone).

*Primary Hazard Class:* 6.1.

*Label Codes:* 6.1, 3.

*Identification Number:* UN3017

*Packing Group:* III.

*Reportable Quantity:* 10 lbs. (Dimethoate); 5000 lbs. (Cyclohexanone).

*Marine Pollutant:* Severe (PP).

*Special Transportation Notes:* For shipments by ground for the United States, the Limited Quantity exception may apply. Under the US 49 CFR, refer to Section 173.153 for additional exception information, if shipping under this exception.

### Canadian Transportation of Dangerous Goods Regulations (TDGR) shipping information:

*Proper Shipping Name:* ORGANOPHOSPHOROUS PESTICIDE, LIQUID, TOXIC, FLAMMABLE (Dimethoate, Cyclohexanone)

*UN No.:* UN 3017

*Primary Class(es):* 6.1

*Subsidiary Class(es):* 3

*Packing Group:* III

*Other Shipping Information:* This product may be shipped by ground within Canada, as a 'Limited Quantity'. Refer to Section 1.17 for Limited Quantity Information, if shipping under this exemption.

## SECTION 15 — REGULATORY INFORMATION

### Canada:

**WHMIS information:** This product is a Pest Control Product and is not regulated as a Controlled Product under the Hazardous Products Act (HPA). However, for reference purposes only, this product would have the following WHMIS Classification if it were regulated as a Controlled Product under the HPA: **Class B3** (*Combustible Liquids*); **Class D1B** (*Materials causing immediate and serious toxic effects, Toxic Material*), **Class D2B** (*Materials causing other toxic effects, Toxic Material*); **Class F** (*Dangerously Reactive Material*).

*This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and this MSDS contains all the information required by the CPR.*

### US Federal Information:

**EPA/CERCLA Reportable Quantity (RQ):** 10 lbs. (Methyl parathion); 5000 lbs. (Cyclohexanone).

**SARA TITLE III:**

Revision Date: November 11, 2013

*Sec. 302, Extremely Hazardous Substances, 40 CFR 355:* This product contains Dimethoate, an Extremely Hazardous Substance under SARA Title III Section 302. The Threshold Planning Quantity (TPQ) for Dimethoate is 500 pounds (for solids in powder form with particle size less than 100 microns, or if the substance is in solution or in molten form) or 10,000 pounds (all other forms).

*Sec. 313, Toxic Chemicals Notification, 40 CFR 372:* This material may be subject to SARA notification requirements, since it contains Dimethoate and 1,2,4-Trimethylbenzene, Toxic Chemical constituents above their *de minimus* concentrations.

**US State Right to Know Laws:**

**California Proposition 65 information:** To the best of our knowledge, this product does not contain any chemicals known to the state of California to cause cancer or reproductive harm.

**New Jersey Hazardous Substance Lists:** This product contains the following substances required to be disclosed on

product labelling:	<u>Chemical Name</u>	<u>CAS #</u>	<u>% (weight)</u>	<u>New Jersey Hazardous Substance</u>
	Dimethoate	60-51-5	30 - 60	Yes
	Cyclohexanone	108-94-1	15 - 40	Yes
	Aromatic solvent naphtha	64742-97-5	7 - 13	No
	1,2,4-Trimethylbenzene	95-63-6	3 - 7	Yes
	Nonylphenol polyethylene glycol ether	127087-87-0	1 - 5	No

**SECTION 16 — OTHER INFORMATION**

**HMIS Rating:** \* - Chronic hazard 0 - Minimal 1 - Slight 2 - Moderate 3 - Serious 4 - Severe

Health: \*2 Flammability: 2 Reactivity: 1

**Legend:**

ACGIH – American Conference of Governmental Industrial Hygienists  
 CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act of 1980  
 NIOSH – National Institute for Occupational Safety and Health  
 PMRA – Canadian Pest Management Regulatory Agency  
 WHMIS – Workplace Hazardous Materials Information System  
 EPA – Environmental Protection Agency  
 HMIS - Hazardous Materials Identification System  
 IARC – International Agency for Research on Cancer  
 MSHA – Mine Safety and Health Administration  
 NTP – National Toxicology Program  
 OSHA – Occupational Safety and Health Act  
 RCRA – Resource Conservation and Recovery Act  
 SARA - Superfund Amendments & Reauthorization Act

CAS - Chemical Abstract Service  
 CFR – Code of Federal Regulations  
 Inh – Inhalation  
 N/Ap – Not Applicable  
 N/Av – Not Available  
 PEL - Permissible Exposure Limit  
 TLV – Threshold Limit Value  
 TSCA – Toxic Substances Control Act

**References:**

1. ACGIH, Threshold Limit Values and Biological Exposure Indices for 2005.
2. Canadian Centre for Occupational Health and Safety, CCInfoWeb databases, 2006 (Chempendium and RTECs).
3. Material Safety Data Sheet from manufacturer.
4. International Agency for Research on Cancer Monographs, searched 2006.
5. US EPA Title III List of Lists – January 27, 2005 version.
6. California Proposition 65 List – February 3, 2006 version.

**Prepared by:** Cheminova Inc.

**Telephone #:** 1-(519)-472-0600 (8 AM to 4:00 PM EST, Monday to Friday)

**Preparation date:** April 17, 2006

**Revision date:** December 19, 2008

**Revision reason:** Update MSDS

**Revision date:** November 10, 2010

**Revision reason:** Update company address – GR

**Revision date:** November 11, 2013

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Page 7 of 7

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