Paraoxon

sc-208151

Material Safety Data Sheet

Hazard Alert Code Key: EXTREME HIGH MODERATE LOW

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

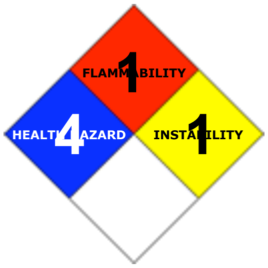
PRODUCT NAME

Paraoxon

STATEMENT OF HAZARDOUS NATURE

CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

NFPA



SUPPLIER

Company: Santa Cruz Biotechnology, Inc.
Address:
2145 Delaware Ave
Santa Cruz, CA 95060
Telephone: 800.457.3801 or 831.457.3800
Emergency Tel: CHEMWATCH: From within the US and Canada: 877-715-9305
Emergency Tel: From outside the US and Canada: +800 2436 2255 (1-800-CHEMCALL) or call +613 9573 3112

PRODUCT USE

Used as insecticide. Relatively high environmental stability may present residue problems. Forms parathion on citrus foliage and soil surface. Parathion is metabolised in the human body to paraoxon.

SYNONYMS

C10-H14-N-O6-P, C10-H14-N-O6-P, O2NC6H4OP(=O)(OC2H5)2, "diethyl-p-nitrophenyl phosphate", "diethyl-p-nitrophenyl phosphate", "O, O-diethyl o, p-nitrophenyl phosphate", "O, O-diethyl o, p-nitrophenyl phosphate", paraoxon-ethyl, "diethyl paraoxon", "O, O-diethyl phosphoric acid o, p-nitrophenyl ester", "O, O-diethyl phosphoric acid o, p-nitrophenyl ester", "ethyl p-nitrophenyl ethylphosphate", "ethyl p-nitrophenyl ethylphosphate", "ethyl paraoxon", "p-nitrophenyl diethylphosphate", "p-nitrophenyl diethylphosphate", oxyparathion, paraoxone, paroxan, "phenol, p-nitro-, ester with diethyl phosphate", "phenol, p-nitro-, ester with diethyl phosphate", "phosphonothioic acid, diethylparanitrophenyl ester (?)", "phosphoric acid diethyl 4-nitrophenyl ester", "phosphoric acid diethyl 4-nitrophenyl ester", Chinorta, E-600, E-600, "ENT 16, 087", "Ester 25", Eticol, Fosfakol, "HC 2072", Mintaco, Mintacol, Miotisal, "Miotisal A", "Pestox 101", Phosphacol, "RCRA Waste No. P041", Soluglacit, "TS 219", insecticide

Section 2 - HAZARDS IDENTIFICATION

CANADIAN WHMIS SYMBOLS

Paraoxon

sc-208151

Material Safety Data Sheet

The Power to Question

Hazard Alert Code Key:	EXTREME	HIGH	MODERATE	LOW

EMERGENCY OVERVIEW

RISK

Very toxic in contact with skin.
Toxic by inhalation and if swallowed.
Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

■ Toxic effects may result from the accidental ingestion of the material; animal experiments indicate that ingestion of less than 40 gram may be fatal or may produce serious damage to the health of the individual.
■ Ingestion may produce nausea, vomiting, depressed appetite, abdominal cramps,and diarrhea.
■ Oral doses of 1.47 mg parathion/man/day produced no signs of toxicity in volunteers. Ingestion of 5.46 mg/kg/day produced moderate depression of blood cholinesterase. A dosage of 0.07 mg/kg/day was regarded as the no-effect level in adults.

EYE

■ There is some evidence to suggest that this material can causeeye irritation and damage in some persons.
■ Direct eye contact can produce tears, eyelid twitches, pupil contraction, loss of focus, and blurred or dimmed vision. Dilation of the pupils occasionally occurs.

SKIN

■ Skin contact with the material may produce severely toxic effects; systemic effects may result following absorption and these may be fatal.
■ The material is not thought to be a skin irritant (as classified using animal models). Temporary discomfort, however, may result from prolonged dermal exposures. Good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.
■ There may be sweating and muscle twitches at site of contact. Reaction may bedelayed by hours.
■ Parathion is absorbed through intact skin at 0.45 - 0.58 mg/hr/cm2. When 0.004 mg parathion was applied to 1 sq. cm. to six male volunteers, 8.6% was absorbed over the following 24 hours. Larger doses were absorbed from the palm, the dorsal part of the hand, forehead skin and penetration from the scrotum was complete.
Application of 1.8-2.4 mg/kg to non-occluded rat skin was associated with a 50% reduction in erythrocyte cholinesterase activity. At least 94% of the applied dose remained on the skin 24 hours after treatment; however after continuous dermal contact of 120 hours, 57%-59% of the dose was absorbed.
Photochemical decomposition of parathion on foliage to paraoxon and its dermal uptake has been associated with signs of cholinesterase inhibition in workers. Once the overt signs of poisoning have appeared, coma usually follows, a condition that often precedes death.
■ Open cuts, abraded or irritated skin should not be exposed to this material.
■ Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED

■ Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may produce toxic effects; these may be fatal.
■ The material is not thought to produce respiratory irritation (as classified using animal models). Nevertheless inhalation of vapors, fumes or aerosols, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.
■ Poisoning due to cholinesterase inhibitors causes symptoms such as increased blood flow to the nose, watery discharge, chest discomfort, shortness of breath and wheezing. Other symptoms include increased production of tears, nausea and vomiting, diarrhea, stomach pain, involuntary passing of urine and stools, chest pain, breathing difficulty, low blood pressure, irregular heartbeat, loss of reflexes, twitching, visual disturbances, altered pupil size, convulsions, lung congestion, coma and heart failure. Nervous system effects include inco-ordination, slurred speech, tremors of the tongue and eyelids, and paralysis of the limbs and muscles of breathing, which can cause death, although death is also seen due to cardiac arrest.

CHRONIC HEALTH EFFECTS

■ Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.
Repeated or prolonged exposures to cholinesterase inhibitors produce symptoms similar to acute effects. In addition workers exposed repeatedly to these substances may exhibit impaired memory and loss of concentration, severe depression and acute psychosis, irritability, confusion, apathy, emotional liability, speech difficulties, headache, spatial disorientation, delayed reaction times, sleepwalking, drowsiness or insomnia. An influenza-like condition with nausea, weakness, anorexia and malaise has been described. There is a growing body of evidence from epidemiological studies and from experimental laboratory studies that short-term exposure to some cholinesterase-inhibiting insecticides may produce behavioral or neuro- chemical changes lasting for days or months, presumably outlasting the cholinesterase inhibition. Although the number of adverse effects following humans poisonings subside, there are still effects in some workers months after cholinesterase activity returns to normal. These long-lasting effects include blurred vision, headache, weakness, and anorexia. The neurochemistry of animals exposed to chlorpyrifos or fenthion is reported to be altered permanently after a single exposure. These effects may be more severe in developing animals where both acetyl- and butyrylcholinesterase may play an integral part in the development of the nervous system.

Padilla S., The Neurotoxicity of Cholinesterase-Inhibiting Insecticides: Past and Present Evidence Demonstrating Persistent Effects. Inhalation Toxicology 7:903-907, 1995.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

HAZARD RATINGS

		Min Max
Flammability:	1	
Toxicity:	4	
Body Contact:	4	
Reactivity:	1	
Chronic:	2	

Min/Nil=0
Low=1
Moderate=2
High=3
Extreme=4

NAME	CAS RN	%
paraoxon	311-45-5	>98
commercial product may contain		
p-nitrophenol	100-02-7	

Section 4 - FIRST AID MEASURES

SWALLOWED

■ If swallowed:

- Contact a Poisons Information Center or a doctor at once.
- If swallowed, activated charcoal may be advised.
- Give atropine if instructed.
- REFER FOR MEDICAL ATTENTION WITHOUT DELAY.
- In the mean time, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition.
- If the services of a medical officer or medical doctor are readily available, the patient should be placed in his/her care and a copy of the MSDS should be provided.
- Further action will be the responsibility of the medical specialist.
- If medical attention is not available on the worksite or surroundings send the patient to a hospital together with a copy of the MSDS.

EYE

■ If this product comes in contact with the eyes:

- Immediately hold eyelids apart and flush the eye continuously with running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- Continue flushing until advised to stop by the Poisons Information Center or a doctor, or for at least 15 minutes.
- Transport to hospital or doctor without delay.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

■ If product comes in contact with skin:

- Contact a Poisons Information Center or a doctor.
- DO NOT allow clothing wet with product to remain in contact with skin, strip all contaminated clothing including boots.
- Quickly wash affected areas vigorously with soap and water.
- DO NOT give anything by mouth to a patient showing signs of narcosis, i.e. losing consciousness.
- Give atropine if instructed.
- DO NOT delay, get to a doctor or hospital quickly.

INHALED

■

- If spray mist, vapor are inhaled, remove from contaminated area.

- Contact a Poisons Information Center or a doctor at once.
- Lay patient down in a clean area and strip any clothing wet with spray.
- Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
- DO NOT give anything by mouth to a patient showing signs of narcosis, i.e. losing consciousness.
- Give atropine if instructed.
- Get to doctor or hospital quickly.

NOTES TO PHYSICIAN

■

- Most organophosphate compounds are rapidly well absorbed from the skin, conjunctiva, gastro-intestinal tract and lungs.
- They are detoxified by Cytochrome P450-mediated monoxygenases in the liver but some metabolites are more toxic than parent compounds.
- Metabolites are usually detected 12-48 hours postexposure.
- Organophosphates phosphorylate acetylcholinesterase with resultant accumulation of large amounts of acetylcholine causing initial stimulation, then exhaustion of cholinergic synapse.
- gamma-aminobutyric acid (GABA)-ergic and dopaminergic pathways provide compensatory inhibition.
- The clinical manifestation of organophosphate toxicity results from muscarinic, nicotinic and CNS symptoms.
- A garlic-like odor emanating from the patient or involved container may aid the diagnosis.
- Immediate life-threatening symptoms usually are respiratory problems.
- Frequent suction and, if necessary, endotracheal intubation and assisted ventilation may be necessary to maintain adequate oxygenation.
- Theophylline compounds, to treat bronchospasm, should be used cautiously as they may lower the seizure threshold.
- Excessive secretions and bronchospasm should respond to adequate doses of atropine.
- Diazepam is the drug of choice for convulsions.
- Usual methods of decontamination, (activated charcoal and cathartics) should be used when patients present 4-6 hours postexposure.
- The administration of atropine, as an antidote, does not require confirmation by acetylcholinesterase levels. Severely poisoned patients develop marked resistance to the usual doses of atropine. [Atropine should not be given to a cyanosed patient - ICI] NOTE: Hypoxia must be corrected before atropine is given. For adult: 2 mg repeatedly SC or IV until atropinization is achieved and maintained (atropinization is characterised by decreased bronchial secretions, heart rate >100 bpm, dry mouth, diluted pupils).
- Pralidoxime (2-PAM, Protopam) is a specific antidote when given within 24 hours and perhaps up to 36-48 hours postexposure. Although it ameliorates muscle weakness, fasciculations and alterations of consciousness, it does not relieve bronchospasm or bronchorrhea and must be given concurrently with atropine. NOTE: Pralidoxime should be given as an adjunct to, NOT a replacement for atropine and should be given in every case where atropine therapy is deemed necessary. Traditional dose: 1 g (or 2 g in severe cases) by slow IV injection over 5-10 minutes. 1-2 g, 4 hourly (maximum dose 12 g in 24 hours) until clinical and analytical recovery is achieved and maintained.
- Avoid parasympathomimetic agents. Phenothiazines and antihistamines may potentiate organophosphate activity. [Ellenhorn and Barceloux: Medical Toxicology]

NOTE: Acute pancreatitis in organophosphate intoxication may be more common than reported. The possible pathogenesis of pancreatic insult are excessive cholinergic stimulation of the pancreas and ductular hypertension. Early recognition and appropriate therapy for acute pancreatitis may lead to an improved prognosis. Cheng-Tin Hsiao, et al; Clinical Toxicology 34(3), 343-347 (1996)BIOLOGICAL EXPOSURE INDEX - BEI These represent the determinants observed in specimens collected from a healthy worker exposed at the Exposure Standard (ES or TLV):

Determinant	Index	Sampling Time	Comments
1. Cholinesterase activity in red cells	70% of individual's baseline	Discretionary	NS

B: Background levels occur in specimens collected from subjects NOT exposed
NS:Non-specific determinant; Also observed after exposure to other materials
SQ:Semi-quantitative determinant; Interpretation may be ambiguous. Should be used as a screening test or confirmatory test.
Some jurisdictions require that health surveillance be conducted on occupationally exposed workers. Such surveillance should emphasise

- demography, occupational and medical history and health advice
- physical examination
- baseline estimation of red cell and plasma cholinesterase activity levels by the Ellman method. Estimation of red cell and plasma cholinesterase activity towards the end of the working day

Hydrolysed rapidly by plasma and tissue esterases to alkyl phosphates (diethylphosphoric acid and di- and monoethyl phosphoric acid). These products are rapidly excreted in the urine.

Section 5 - FIRE FIGHTING MEASURES

Vapour Pressure (mmHG):	Not available
Upper Explosive Limit (%):	Not available.
Specific Gravity (water=1):	1.274
Lower Explosive Limit (%):	Not available.

EXTINGUISHING MEDIA

■

- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.
- Water spray or fog - Large fires only.

FIRE FIGHTING

■

- Alert Emergency Responders and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Use fire fighting procedures suitable for surrounding area.
- DO NOT approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.
- Equipment should be thoroughly decontaminated after use.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

■

- Combustible.
- Slight fire hazard when exposed to heat or flame.
- Heating may cause expansion or decomposition leading to violent rupture of containers.
- On combustion, may emit toxic fumes of carbon monoxide (CO).
- May emit acrid smoke.
- Mists containing combustible materials may be explosive.

Combustion products include: carbon dioxide (CO2), nitrogen oxides (NOx), phosphorus oxides (POx), other pyrolysis products typical of burning organic material.
May emit poisonous fumes.

FIRE INCOMPATIBILITY

■ Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids,chlorine bleaches, pool chlorine etc. as ignition may result.

PERSONAL PROTECTION

Glasses:
Full face- shield.
Gloves:
Respirator:
Type A-P Filter of sufficient capacity

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

■

- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid breathing vapors and contact with skin and eyes.
- Control personal contact by using protective equipment.
- Contain and absorb spill with sand, earth, inert material or vermiculite.
- Wipe up.
- Place in a suitable labeled container for waste disposal.

MAJOR SPILLS

■ Chemical Class: organophosphates

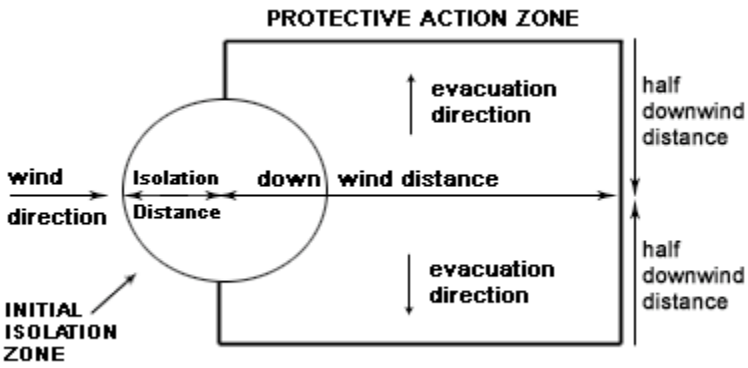
For release onto land: recommended sorbents listed in order of priority.

SORBENT TYPE	RANK	APPLICATION	COLLECTION	LIMITATIONS
LAND SPILL - SMALL				
cross-linked polymer - particulate	1	shovel	shovel	R, W, SS
cross-linked polymer - pillow	1	throw	pitchfork	R, DGC, RT
wood fiber - pillow	1	throw	pitchfork	R,P, DGC, RT
foamed glass - pillow	2	shovel	shovel	R, W, P, DGC
sorbent clay - particulate	2	shovel	shovel	R, I, P
wood fibre - particulate	3	shovel	shovel	R,W, P, DGC
LAND SPILL - MEDIUM				
cross-linked polymer -particulate	1	blower	skiploader	R, W, SS
sorbent clay - particulate	2	blower	skiploader	R, I, P
polypropylene - particulate	2	blower	skiploader	R, SS, DGC
expanded mineral - particulate	3	blower	skiploader	R,I, W, P, DGC
wood fiber- particulate	3	blower	skiploader	R, W, P, DGC
polypropylene - mat	3	throw	skiploader	DGC, RT

Legend
DGC: Not effective where ground cover is dense
R; Not reusable
I: Not incinerable
P: Effectiveness reduced when rainy
RT:Not effective where terrain is rugged
SS: Not for use within environmentally sensitive sites
W: Effectiveness reduced when windy
Reference: Sorbents for Liquid Hazardous Substance Cleanup and Control;
R.W Melvold et al: Pollution Technology Review No. 150: Noyes Data Corporation 1988.

- Clear area of personnel and move upwind.
- Alert Emergency Responders and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labeled containers for recycling.
- Neutralize/decontaminate residue.
- Collect solid residues and seal in labeled drums for disposal.
- Wash area and prevent runoff into drains.
- After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
- If contamination of drains or waterways occurs, advise emergency services.

PROTECTIVE ACTIONS FOR SPILL



From IERG (Canada/Australia)	
Isolation Distance	25 meters
Downwind Protection Distance	250 meters

FOOTNOTES

1 PROTECTIVE ACTION ZONE is defined as the area in which people are at risk of harmful exposure. This zone assumes that random changes in wind direction confines the vapour plume to an area within 30 degrees on either side of the predominant wind direction, resulting in a crosswind protective action distance equal to the downwind protective action distance.
2 PROTECTIVE ACTIONS should be initiated to the extent possible, beginning with those closest to the spill and working away from the site in the downwind direction. Within the protective action zone a level of vapour concentration may exist resulting in nearly all unprotected persons becoming incapacitated and unable to take protective action and/or incurring serious or irreversible health effects.
3 INITIAL ISOLATION ZONE is determined as an area, including upwind of the incident, within which a high probability of localised wind reversal may expose nearly all persons without appropriate protection to life-threatening concentrations of the material.
4 SMALL SPILLS involve a leaking package of 200 litres (55 US gallons) or less, such as a drum (jerrican or box with inner containers). Larger packages leaking less than 200 litres and compressed gas leaking from a small cylinder are also considered "small spills". LARGE SPILLS involve many small leaking packages or a leaking package of greater than 200 litres, such as a cargo tank, portable tank or a "one-tonne" compressed gas cylinder.
5 Guide 152 is taken from the US DOT emergency response guide book.
6 IERG information is derived from CANUTEC - Transport Canada.

ACUTE EXPOSURE GUIDELINE LEVELS (AEGL) (in ppm)

AEGL 1: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.
AEGL 2: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.
AEGL 3: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

■

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.
- DO NOT enter confined spaces until atmosphere has been checked.
- DO NOT allow material to contact humans, exposed food or food utensils.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- Keep containers securely sealed when not in use.
- Avoid physical damage to containers.

- Always wash hands with soap and water after handling.
- Work clothes should be laundered separately.
- Launder contaminated clothing before re-use.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.

RECOMMENDED STORAGE METHODS

■

- DO NOT use unlined steel containers
- Lined metal can, Lined metal pail/drum
- Plastic pail
- Polyliner drum
- Packing as recommended by manufacturer.
- Check all containers are clearly labeled and free from leaks.

For low viscosity materials

- Drums and jerricans must be of the non-removable head type.
- Where a can is to be used as an inner package, the can must have a screwed enclosure.

For materials with a viscosity of at least 2680 cSt. (23 deg. C) and solids (between 15 C deg. and 40 deg C.):

- Removable head packaging;
- Cans with friction closures and
- low pressure tubes and cartridges may be used.

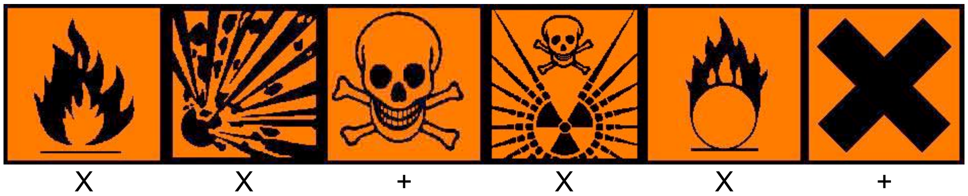
- Where combination packages are used, and the inner packages are of glass, there must be sufficient inert cushioning material in contact with inner and outer packages * . - In addition, where inner packagings are glass and contain liquids of packing group I and II there must be sufficient inert absorbent to absorb any spillage *. - * unless the outer packaging is a close fitting molded plastic box and the substances are not incompatible with the plastic. All inner and sole packagings for substances that have been assigned to Packaging Groups I or II on the basis of inhalation toxicity criteria, must be hermetically sealed.

STORAGE REQUIREMENTS

■

- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS



X: Must not be stored together
O: May be stored together with specific preventions
+: May be stored together

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m³	STEL ppm	STEL mg/m³	Peak ppm	Peak mg/m³	TWA F/CC	Notes
US - Oregon Permissible Exposure Limits (Z3)	p-nitrophenol (Inert or Nuisance Dust: (d) Total dust)		10						*

Hazard Alert Code Key:	EXTREME	HIGH	MODERATE	LOW

US OSHA Permissible Exposure Levels (PELs) - Table Z3	p-nitrophenol (Inert or Nuisance Dust: (d) Respirable fraction)		5						
US OSHA Permissible Exposure Levels (PELs) - Table Z3	p-nitrophenol (Inert or Nuisance Dust: (d) Total dust)		15						
US - Hawaii Air Contaminant Limits	p-nitrophenol (Particulates not other wise regulated - Total dust)		10						
US - Hawaii Air Contaminant Limits	p-nitrophenol (Particulates not other wise regulated - Respirable fraction)		5						
US - Oregon Permissible Exposure Limits (Z3)	p-nitrophenol (Inert or Nuisance Dust: (d) Respirable fraction)		5						*
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	p-nitrophenol (Particulates not otherwise regulated Respirable fraction)		5						
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants	p-nitrophenol (Particulates not otherwise regulated (PNOR)(f)- Respirable fraction)		5						
US - Michigan Exposure Limits for Air Contaminants	p-nitrophenol (Particulates not otherwise regulated, Respirable dust)		5						
Canada - Northwest Territories Occupational Exposure Limits (English)	p-nitrophenol (Nitrobenzene - Skin)	1	5	2	10				

The following materials had no OELs on our records

- paraoxon: CAS:311-45-5

MATERIAL DATA

PARAOXON:

■ For parathion:

The recommended TLV-TWA is greater than the exposure that causes detectable cholinesterase inhibition and accounts for an occupational dose of 0.014 mg/kg/day. A dosage of 0.07 mg/kg/day is regarded as the no-effect level in man. The measurement of cholinesterase reduction is a sensitive indicator of exposure.

A skin notation is thought appropriate because parathion is readily absorbed through the skin causing systemic poisoning and death in humans.

Exposure limits with "skin" notation indicate that vapor and liquid may be absorbed through intact skin. Absorption by skin may readily exceed vapor inhalation exposure. Symptoms for skin absorption are the same as for inhalation. Contact with eyes and mucous membranes may also contribute to overall exposure and may also invalidate the exposure standard.

CEL TWA: 0.1 mg/m3 (skin) (compare TLV-TWA parathion)

P-NITROPHENOL:

■ It is the goal of the ACGIH (and other Agencies) to recommend TLVs (or their equivalent) for all substances for which there is evidence of health effects at airborne concentrations encountered in the workplace.

At this time no TLV has been established, even though this material may produce adverse health effects (as evidenced in animal experiments or clinical experience). Airborne concentrations must be maintained as low as is practically possible and occupational exposure must be kept to a minimum.

NOTE: The ACGIH occupational exposure standard for Particles Not Otherwise Specified (P.N.O.S) does NOT apply.

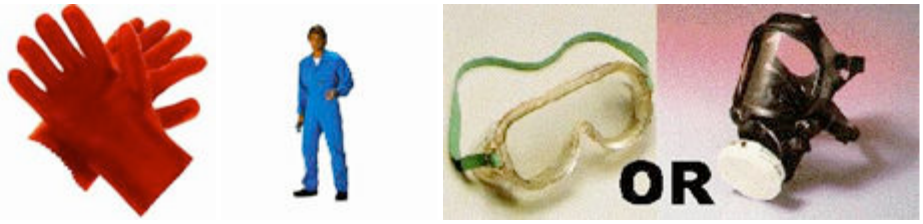
Sensory irritants are chemicals that produce temporary and undesirable side-effects on the eyes, nose or throat. Historically occupational exposure standards for these irritants have been based on observation of workers' responses to various airborne concentrations. Present day expectations require that nearly every individual should be protected against even minor sensory irritation and exposure standards are established using uncertainty factors or safety factors of 5 to 10 or more. On occasion animal no-observable-effect-levels (NOEL) are used to determine these limits where human results are unavailable. An additional approach, typically used by the TLV committee (USA) in determining respiratory standards for this group of chemicals, has been to assign ceiling values (TLV C) to rapidly acting irritants and to assign short-term exposure limits (TLV STELs) when the weight of evidence from irritation, bioaccumulation and other endpoints combine to warrant such a limit. In contrast the MAK Commission (Germany) uses a five-category system based on intensive odour, local irritation, and elimination half-life. However this system is being replaced to be consistent with the European Union (EU) Scientific Committee for Occupational Exposure Limits (SCOEL); this is more closely allied to that of the USA.

OSHA (USA) concluded that exposure to sensory irritants can:

- cause inflammation
- cause increased susceptibility to other irritants and infectious agents

- lead to permanent injury or dysfunction
- permit greater absorption of hazardous substances and
- acclimate the worker to the irritant warning properties of these substances thus increasing the risk of overexposure.

PERSONAL PROTECTION



Consult your EHS staff for recommendations

EYE

■

- Chemical goggles.
- Full face shield.
- Contact lenses pose a special hazard; soft contact lenses may absorb irritants and all lenses concentrate them.

HANDS/FEET

■ Elbow length PVC gloves.

Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: such as:

- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739).

- When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended.
- When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended.
- Contaminated gloves should be replaced.

Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

OTHER

■

- Overalls.
- Eyewash unit.
- Barrier cream.
- Skin cleansing cream.
- Ensure that there is a supply of atropine tablets on hand
- Ensure all employees have been informed of symptoms of carbamate poisoning and that the use of atropine in first aid is understood .

RESPIRATOR

■ Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Breathing Zone Level ppm (volume)	Maximum Protection Factor	Half-face Respirator	Full-Face Respirator
1000	10	A-1 P	-
1000	50	-	A-1 P
5000	50	Airline*	-
5000	100	-	A-2 P
10000	100	-	A-3 P
	100+		Airline* *

* - Continuous Flow ** - Continuous-flow or positive pressure demand.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

Use appropriate NIOSH-certified respirator based on informed professional judgement. In conditions where no reasonable estimate of exposure can be made, assume the exposure is in a concentration IDLH and use NIOSH-certified full face pressure demand SCBA with a minimum service life of 30 minutes, or a combination full facepiece pressure demand SAR with auxiliary self-contained air supply. Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

ENGINEERING CONTROLS

■ Local exhaust ventilation usually required. If risk of overexposure exists, wear an approved respirator. Correct fit is essential to obtain adequate protection an approved self contained breathing apparatus (SCBA) may be required in some situations. Provide adequate ventilation in warehouse or closed storage area.

Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

Type of Contaminant:	Air Speed:
solvent, vapors, degreasing etc., evaporating from tank (in still air).	0.25-0.5 m/s (50-100 f/min.)
aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)	0.5-1 m/s (100-200 f/min.)
direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1-2.5 m/s (200-500 f/min.)
grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	2.5-10 m/s (500-2000 f/min.)

Within each range the appropriate value depends on:

Lower end of the range	Upper end of the range
1: Room air currents minimal or favorable to capture	1: Disturbing room air currents
2: Contaminants of low toxicity or of nuisance value only.	2: Contaminants of high toxicity
3: Intermittent, low production.	3: High production, heavy use
4: Large hood or large air mass in motion	4: Small hood-local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Liquid.
Toxic or noxious vapors/ gas.

State	Liquid	Molecular Weight	275.20
Melting Range (°F)	Not available	Viscosity	Not Available
Boiling Range (°F)	336.2- 338(1 mm Hg)	Solubility in water (g/L)	Reacts
Flash Point (°F)	>230	pH (1% solution)	Not applicable.
Decomposition Temp (°F)	Not Available	pH (as supplied)	Not applicable
Autoignition Temp (°F)	Not available.	Vapour Pressure (mmHG)	Not available
Upper Explosive Limit (%)	Not available.	Specific Gravity (water=1)	1.274
Lower Explosive Limit (%)	Not available.	Relative Vapor Density (air=1)	Not available.
Volatile Component (%vol)	Not available.	Evaporation Rate	Not available

APPEARANCE

Pale-yellow oily liquid; does not mix well with water (2.4 mg/ml). Soluble in ether. Approximately 300 times more stable to hydrolysis than tetraethyl pyrophosphate. Uncatalysed reaction with water is small (overall velocity constant is K=0.25[OH]+1x10-exp 6 min-1).

Section 10 - CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY

■

- Presence of heat source and direct sunlight
- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerization will not occur.

STORAGE INCOMPATIBILITY

■ A number of phosphate and thiophosphate esters are of limited thermal stability and undergo highly exothermic self-accelerating decomposition reactions which may be catalyzed by impurities. The potential hazards can be reduced by appropriate thermal control measures.
BRETHERICK L.: Handbook of Reactive Chemical Hazards.
Segregate from alcohol, water.
Avoid strong acids.
Avoid reaction with oxidizing agents.

- NOTE: May develop pressure in containers; open carefully. Vent periodically.

For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

paraoxon

TOXICITY AND IRRITATION

■ unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

TOXICITY	IRRITATION
Oral (rat) LD50: 1.8 mg/kg	Nil Reported
Intraperitoneal (rat) LD50: 0.716 mg/kg	
Subcutaneous (rat) LD50: 0.426 mg/kg	
Intravenous (rat) LD50: 0.24 mg/kg	
Intramuscular (rat) LD50: 0.446 mg/kg	
Intraperitoneal (mouse) LD50: 0.33 mg/kg	
Subcutaneous (mouse) LD50: 0.27 mg/kg	
Intravenous (mouse) LD50: 0.52 mg/kg	
Intramuscular (mouse) LD50: 0.710 mg/kg	
Subcutaneous (cat) LD50: 0.7 mg/kg	
Dermal (rabbit) LD50: 5 mg/kg	
Intraperitoneal (rabbit) LD50: 3.31 mg/kg	
Subcutaneous (rabbit) LD50: 0.23 mg/kg	
Intravenous (rabbit) LD50: 0.3 mg/kg	
Subcutaneous (g.pig) LD50: 0.5 mg/kg	

■ For parathion:

Acute Toxicity: Parathion is highly toxic by all routes of exposure. Human fatalities have been caused by ingestion, dermal adsorption, and inhalation of parathion As with all organophosphates, parathion is readily absorbed through the skin (1). Skin which has come in contact with this material should be washed immediately with soap and water and all contaminated clothing should be removed. Persons with cardiovascular, liver or kidney diseases, glaucoma, or central nervous system abnormalities may be at increased risk from exposure to parathion. High environmental temperatures or exposure of the chemical to visible or UV light may increase its toxicity . Parathion may cause thickening and roughening of the skin (hyperkeratinisation). It does not cause sensitisation (allergies). Parathion is not irritating to the eyes.

Splashing parathion into an eye may cause constriction of the pupil, making it difficult to determine the path of moving objects.
Chronic Toxicity: An influenza-like condition with headache, nausea, weakness, loss of appetite, and malaise has also been reported . One study found that dietary doses of 50 ppm (about 2.5 mg/kg/day) produced toxic symptoms, growth retardation and death in rats. In another feeding study, dietary doses of 2.5 mg/kg/day for 2-years had no effect on rats, while doses of 5 mg/kg/day produced only slight signs of toxicity and growth retardation, but no deaths .
Reproductive Effects: Once in the bloodstream, parathion may cross the placenta . Repeated feedings to female rats before mating resulted in adverse effects on the reproductive system . In lab animals, such as rats and mice, several effects are seen. Fewer pups are born to dams fed parathion. These pups have reduced birth weight and do not tend to survive as well as normal pups
Teratogenic Effects: While parathion is toxic to the foetus, it does not cause birth defects .
Mutagenic Effects: Dietary doses of parathion failed to produce dominant lethal effects in mice
Carcinogenic Effects: Parathion is a possible carcinogen .
Organ Toxicity: In humans poisoned with parathion, an increase in brain weight occurs. Dogs have changes in their livers Delayed neurotoxicity is not a problem with parathion .
Fate in Humans and Animals: Parathion is readily absorbed into the bloodstream from the skin, lungs or gut . The vapor pressure of parathion is so low that breathing the vapor alone is not a likely source of poisoning. Breathing dusts, or aerosols, may be extremely dangerous. Parathion is rapidly distributed through the body. The liver metabolises parathion into the active metabolite: paraoxon. It is paraoxon that actually inhibits the cholinesterase. Paraoxon is further metabolized to compounds such as p-nitrophenol which is readily excreted in the urine. Parathion may be stored in fat. The organophosphates (parathion) are rapidly broken down once they are mobilized from the fat stores.
Miosis, parasympathomimetic nervous system effects, tremour, convulsions,
coma, cyanosis, true cholinesterase effects recorded.

CARCINOGEN

Non-arsenical insecticides (occupational exposures in spraying and application of)	International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs	Group	2A
Diethyl-p-nitrophenylphosphate	US EPA Carcinogens Listing	Carcinogenicity	D
Diethyl-p-nitrophenylphosphate	US ACGIH Threshold Limit Values (TLV) - Carcinogens	Carcinogen Category	D

Section 12 - ECOLOGICAL INFORMATION

Refer to data for ingredients, which follows:
P-NITROPHENOL:
PARAOXON:
■ DO NOT discharge into sewer or waterways.
■ Do NOT allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters.
Wastes resulting from use of the product must be disposed of on site or at approved waste sites.
■ May cause long-term adverse effects in the aquatic environment.
PARAOXON:
■ Toxic to aquatic organisms.
■ For parathion:
log Kow : 2.799
Koc : 602-15860
Half-life (hr) air : 0.083
Half-life (hr) H2O surface water : 120-168
Henry's atm m3 /mol: 5.65E-07
Environmental fate:
Breakdown of Chemical in Soil and Groundwater: Parathion has little or no potential for groundwater contamination . It binds tightly to soil particles and is degraded by biological and chemical processes within several weeks. Degradation is faster in flooded soil. Residues of parathion can persist for many years, but usually remain in the upper 6 inches of soil. Photodegradation may occur on soil surfaces . Sunlight can convert parathion into the active metabolite paraoxon, which is more toxic than parathion. The breakdown of parathion in soil or water increases with increasing (more alkaline) pH. Soil microorganisms, sunlight, plants and water all break parathion down.
Breakdown of Chemical in Water: In open water, parathion will usually disappear within a week, mainly by adsorption to suspended particles and bottom sediments. Adsorbed parathion is subject to degradation by microorganisms and chemical hydrolysis. The half-life for photo-degradation of parathion in water is 1 to 10 days. Increasing the pH (alkalinity), increases the rate of breakdown .
Breakdown of Chemical in Vegetation: Following spray applications, parathion residues on foliage will decay with a half-life of 1 day, reaching low levels in a week or two . In orange groves, the half-life of parathion is as long as one month. Usually, it is closer to one-two weeks. Most crops tolerate parathion very well. Only at high application rates do apples, cucumbers, and tomatoes suffer from parathion usage
Bioconcentration/ bioaccumulation: Bioconcentration of parathion is low to moderate. There is no evidence of bioaccumulation of parathion in

cattle, sheep or rabbits
Ecotoxicity:
Fish LC50 (96 h) trout 1.6 mg/l; goldfish 1.8 mg/l; catfish 2.7 mg/l; mosquito fish 0.3 mg/l; bluegill sunfish 0.02 mg/l
Parathion is moderately toxic to fish and aquatic invertebrates (like crayfish, snails and worms)
Bird LD50: bobwhite quail 6 mg/kg; pigeon 3 mg/kg; duck 2.1 mg/kg
Parathion is extremely toxic to birds.

■ Organophosphorus pesticides are relatively non-persistent in the environment with half-lives ranging from hours to several weeks or months. Only rarely are they found in crops beyond the growing season during which they are applied. Chemical or photochemical mechanisms may produce a leaving group which is easily degraded. As a rule these compounds do not represent a serious problem as contaminants of soil and water. Breakdown products are usually non-toxic being composed of low-molecular weight, volatile molecules that are easily degraded and utilized by micro-organisms.

Being esters they are also susceptible to hydrolysis. Most organophosphorus pesticides are stable to acid pHs but under alkaline conditions hydrolysis is rapid with the breakdown rate increasing 10-fold for each pH unit above 7. An increase of 10 deg. C of temperature will increase the hydrolysis rate approximately 4-fold. When these compounds are present in the soil their disappearance is affected by their interaction with the physical characteristics and water content of the soil, and the microflora present.

In certain types of soil strong binding may make them unavailable for biological decomposition. In such soils even running water produces little movement and thus minimal contamination of water supplies. Less tightly bound substances are similarly unlikely to produce substantial contamination because of rapid breakdown. Metallic ions in the soil interact with organophosphorus pesticides through hydrogen linkage whilst increased organic matter facilitates further binding.

In general only minute amounts of pesticide residue and their breakdown products are found in natural water systems. In soil however there is a greater likelihood of the presence and buildup of toxic residues.

■ The material is classified as an ecotoxin* because the Daphnia EC50 (48 hours) is less than or equal to 0.1 mg/l
* Classification of Substances as Ecotoxic (Dangerous to the Environment)
Appendix 8, Table 1
Compiler's Guide for the Preparation of International Chemical Safety Cards: 1993 Commission of the European Communities.
P-NITROPHENOL:

■ Hazardous Air Pollutant:	Yes
■ Fish LC50 (96hr.) (mg/l):	4- 6 (6hr)
■ Daphnia magna EC50 (48hr.) (mg/l):	14
■ log Kow (Sangster 1997):	1.91
■ Half- life Soil - High (hours):	29
■ Half- life Soil - Low (hours):	17
■ Half- life Air - High (hours):	145
■ Half- life Air - Low (hours):	3.1
■ Half- life Surface water - High (hours):	168
■ Half- life Surface water - Low (hours):	18.2
■ Half- life Ground water - High (hours):	235
■ Half- life Ground water - Low (hours):	36.4
■ Aqueous biodegradation - Aerobic - High (hours):	168
■ Aqueous biodegradation - Aerobic - Low (hours):	18.2
■ Aqueous biodegradation - Anaerobic - High (hours):	235
■ Aqueous biodegradation - Anaerobic - Low (hours):	163
■ Aqueous biodegradation - Removal secondary treatment - High (hours):	100%
■ Aqueous biodegradation - Removal secondary treatment - Low (hours):	90%
■ Aqueous photolysis half- life - High (hours):	329
■ Aqueous photolysis half- life - Low (hours):	3.1
■ Photolysis maximum light absorption - High (nano- m):	310
■ Photolysis maximum light absorption - Low (nano- m):	227
■ Aqueous photolysis half- life - High (hours):	329
■ Aqueous photolysis half- life - Low (hours):	3.1

■ Photooxidation half- life water - High (hours):	4.90E+04
■ Photooxidation half- life water - Low (hours):	642
■ Photooxidation half- life air - High (hours):	145
■ Photooxidation half- life air - Low (hours):	14.5

■ Harmful to aquatic organisms.

■ Environmental toxicity is a function of the n-octanol/ water partition coefficient (log Pow, log Kow). Phenols with log Pow >7.4 are expected to exhibit low toxicity to aquatic organisms. However the toxicity of phenols with a lower log Pow is variable, ranging from low toxicity (LC50 values >100 mg/l) to highly toxic (LC50 values <1 mg/l) dependent on log Pow, molecular weight and substitutions on the aromatic ring. Dinitrophenols are more toxic than predicted from QSAR estimates. Hazard information for these groups is not generally available.

■ for nitrophenols:

Environmental fate:

In the air, both photolysis and physical removal processes such as gravitational settling of aerosols and wet deposition by rain and snow will probably determine the fate of 2-nitrophenol and 4-nitrophenol. The atmospheric half-lives of these compounds are not known. In water, both photolysis and biodegradation will be important fate processes. Photolysis will be more important in near-surface water; where attenuation of sunlight is usually minimal. The half-life of the nitrophenols may range between 1 and 8 days in fresh water and may range between 13 and 21 days in sea water. In soils, biodegradation may be the most important fate process for these nitrophenols. In top-soil, the half-life of 4-nitrophenol may be about l-3 days under aerobic conditions and around 14 days under anaerobic conditions. In subsoils, the half-life of 4-nitrophenol may be about 40 days under aerobic conditions and even slower under anaerobic conditions. The half-life of 2-nitrophenol may be about 12 days under aerobic conditions. However, other studies have found that the rate of disappearance of nitrophenols, both in water and soil, may not be first-order, and evaluation of a biodegradation half-life may not be meaningful. The products of biodegradation have also been studied with pure cultures of microorganisms. Catechol, beta-keto adipic acid, and nitrite have been identified as products of aerobic biodegradation of 2-nitrophenol and 4-nitrocatechol, hydroquinone, gamma-ydroxymuconic semialehyde, and nitrite from 4-nitrophenol. On the other hand, 2-aminophenol and 4- minophenol have been isolated from anaerobic biodegradation of 2-nitrophenol and 4-nitrophenol, respectively.

Several authors have used natural waters to study the aerobic biodegradability of 4-nitrophenol and concluded that, after a few days of adaptation, it will rapidly biodegrade in many of these waters.The half-life of biodegradation in natural water (parent compound disappearance) reported or estimated from experimental results are as follows: about 3.5 days in a river; a mean of 3.2 days for five pond and river waters and ; and a mean of less than 1 day for five pond and river waters based on the concentration of degrader microorganisms of 10+6 organisms/ml.

Although some data on bioconcentrations of these chemicals in edible aquatic organisms and transfer of the chemicals from soil to edible plants are available it has not yet been firmly established whether food chain bioaccumulation occurs. There is also a lack of data on plant-to-animal transfer. Data on the biomagnification of these chemicals in the food chain are scant. Significant food chain bioaccumulation would indicate the possibility of significant human exposure to these chemicals from the consumption of aquatic and terrestrial foods.

log Kow: 1.87-1.91
Koc: 21-55
Half-life (hr) air: 123-336
Half-life (hr) H2O surface water: 24-336
Half-life (hr) soil: 24-960
Henry's atm m³ /mol: 3.31E-08
BCF: 11.0-79
Toxicity Fish: LC50(8) 24mg/L
Toxicity invertebrate: cell mult. inhib.3.4-7mg/L
Anaerobic effects: sig degrad
Effects on algae and plankton: cell mult. inhib. algae 7.6-17mg/L
Degradation Biological: soil microflora 4 days,sig
processes Abiotic: nohydrol,photol,dissoc,Rxn OH*

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
paraoxon	HIGH		LOW	HIGH
p-nitrophenol	LOW	HIGH	LOW	MED

Section 13 - DISPOSAL CONSIDERATIONS

US EPA Waste Number & Descriptions

B. Component Waste Numbers

When paraoxon is present as a solid waste as a discarded commercial chemical product, off-specification species, as a container residue, or a spill residue, use EPA waste number P041 (waste code T).

When p-nitrophenol is present as a solid waste as a discarded commercial chemical product, off-specification species, as a container residue, or a spill residue, use EPA waste number U170 (waste code T).

Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.
¦ Puncture containers to prevent re-use and bury at an authorized landfill.
Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.
A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.
DO NOT allow wash water from cleaning equipment to enter drains. Collect all wash water for treatment before disposal.

- Recycle wherever possible. Special hazard may exist - specialist advicemay be required.
- Consult manufacturer for recycling options.
- Consult Waste Management Authority for disposal.
- Bury or incinerate residue at an approved site.
- Decontaminate empty containers. Observe all label safeguards untilcontainers are cleaned and destroyed.
- Puncture containers to prevent re-use and bury at an authorized landfill.

Section 14 - TRANSPORTATION INFORMATION

DOT:

Symbols:	None	Hazard class or Division:	6.1
Identification Numbers:	UN3018	PG:	I
Label Codes:	6.1	Special provisions:	N76, T14, TP2, TP13, TP27
Packaging: Exceptions:	None	Packaging: Non-bulk:	201
Packaging: Exceptions:	None	Quantity limitations: Passenger aircraft/rail:	1 L
Quantity Limitations: Cargo aircraft only:	30 L	Vessel stowage: Location:	B
Vessel stowage: Other:	40	S.M.P.:	YES

Hazardous materials descriptions and proper shipping names:
Organophosphorus pesticides, liquid, toxic

Air Transport IATA:

ICAO/IATA Class:	6.1	ICAO/IATA Subrisk:	None
UN/ID Number:	3018	Packing Group:	I
Special provisions:	A3		

Shipping Name: ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC *(CONTAINS PARAOXON)

Maritime Transport IMDG:

IMDG Class:	6.1	IMDG Subrisk:	None
UN Number:	3018	Packing Group:	I

Section 15 - REGULATORY INFORMATION

paraoxon (CAS: 311-45-5) is found on the following regulatory lists;

"US - Massachusetts Oil & Hazardous Material List","US - New Jersey Right to Know Hazardous Substances","US - Pennsylvania - Hazardous Substance List","US - Vermont Hazardous Constituents","US - Vermont Hazardous Waste - Acutely Hazardous Wastes","US - Washington Dangerous waste constituents list","US - Washington Discarded Chemical Products List - ""P"" Chemical Products","US Department of Transportation (DOT) List of Hazardous Substances and Reportable Quantities - Hazardous Substances Other Than Radionuclides","US Department of Transportation (DOT) Marine Pollutants - Appendix B","US EPA Carcinogens Listing","US List of Lists - Consolidated List of Chemicals Subject to the Emergency Planning and Community Right-to-Know Act (EPCRA) and Section 112(r) of the Clean Air Act","US RCRA (Resource Conservation & Recovery Act) - Hazardous Constituents - Appendix VIII to 40 CFR 261","US RCRA (Resource Conservation & Recovery Act) - List of Hazardous Wastes"

Regulations for ingredients

p-nitrophenol (CAS: 100-02-7) is found on the following regulatory lists;

"Canada - Saskatchewan Environmental Persistent or Chronic Hazardous Substances","Canada Ingredient Disclosure List (SOR/88-64)","Canada National Pollutant Release Inventory (NPRI)","International Council of Chemical Associations (ICCA) - High Production Volume List","OECD Representative List of High Production Volume (HPV) Chemicals","US - California Air Toxics ""Hot Spots"" List (Assembly Bill 2588) Substances for which emissions must be quantified","US - California Toxic Air Contaminant List Category V","US - Massachusetts Oil & Hazardous Material List","US - New Jersey Right to Know Hazardous Substances","US - Pennsylvania - Hazardous Substance List","US - Rhode Island Hazardous Substance List","US - Vermont Hazardous Constituents","US - Vermont Hazardous wastes which are Discarded Commercial Chemical Products or Off-Specification Batches of Commercial Chemical Products or Spill Residues of Either","US - Washington Dangerous waste constituents list","US - Washington Discarded Chemical Products List - ""U"" Chemical Products","US CAA (Clean Air Act) - HON Rule - Organic HAPs (Hazardous Air Pollutants)","US CERCLA Priority List of Hazardous Substances","US Clean Air Act - Hazardous Air Pollutants","US CWA (Clean Water Act) - List of Hazardous Substances","US CWA (Clean Water Act) - Priority Pollutants","US Department of Transportation (DOT) List of Hazardous Substances and Reportable Quantities - Hazardous Substances Other Than Radionuclides","US DOE Temporary Emergency Exposure Limits (TEELs)","US EPA High Production Volume Program Chemical List","US EPCRA Section 313 Chemical List","US List of Lists - Consolidated List of Chemicals Subject to the Emergency Planning and Community Right-to-Know Act (EPCRA) and Section 112(r) of the Clean Air Act","US RCRA (Resource Conservation & Recovery Act) - Appendix IX to Part 264 Ground-Water Monitoring List 1","US RCRA (Resource Conservation & Recovery Act) - Hazardous Constituents - Appendix VIII to 40 CFR 261","US RCRA (Resource Conservation & Recovery Act) - List of Hazardous Inorganic and Organic Constituents 1","US RCRA (Resource Conservation & Recovery Act) - List of Hazardous Wastes","US RCRA (Resource Conservation & Recovery Act) - Phase 4 LDR Rule - Universal Treatment Standards","US Toxic Substances Control Act (TSCA) - Inventory","US TSCA Section 4 - Multichemical Test Rules / Waste Constituents","US TSCA Section 4/12 (b) - Sunset Date/Status","US TSCA Section 8 (d) - Health and Safety Data Reporting"

Section 16 - OTHER INFORMATION

LIMITED EVIDENCE

- ■ Cumulative effects may result following exposure*.
- ■ May produce discomfort of the eyes*.

* (limited evidence).

Denmark Advisory list for selfclassification of dangerous substances

Substance CAS Suggested codes p- nitrophenol 100- 02- 7 Xn Mut3; R68 Repr3; R63 N R50

■ Classification of the mixture and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.
A list of reference resources used to assist the committee may be found at:
www.chemwatch.net/references.

Paraoxon

sc-208151

Material Safety Data Sheet

The Power to Question

Hazard Alert Code Key:	EXTREME	HIGH	MODERATE	LOW

■ The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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