Triethylphosphine

sc-251330

Material Safety Data Sheet

Hazard Alert Code Key:	EXTREME	HIGH	MODERATE	LOW

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
Triethylphosphine

STATEMENT OF HAZARDOUS NATURE
CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

NFPA

SUPPLIER
Santa Cruz Biotechnology, Inc.
2145 Delaware Avenue
Santa Cruz, California 95060
800.457.3801 or 831.457.3800

EMERGENCY
ChemWatch
Within the US & Canada: 877-715-9305
Outside the US & Canada: +800 2436 2255
(1-800-CHEMCALL) or call +613 9573 3112

PRODUCT USE
Intermediate.

SYNONYMS
C6-H15-P, (CH3CH2)3P, "phosphine, triethyl-", TL-409

Section 2 - HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS

		Min	Max
Flammability:	3		
Toxicity:	2		
Body Contact:	3		
Reactivity:	1		
Chronic:	2		

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

CANADIAN WHMIS SYMBOLS

EMERGENCY OVERVIEW

RISK

Spontaneously flammable in air.
Harmful by inhalation.
Causes burns.
Risk of serious damage to eyes.
Highly flammable.
May cause fire.
May cause long-term adverse effects in the aquatic environment.

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

■ The material can produce chemical burns within the oral cavity and gastrointestinal tract following ingestion.
■ The material is not thought to produce adverse health effects following ingestion (as classified using animal models). Nevertheless, adverse systemic effects have been produced following exposure of animals by at least one other route and good hygiene practice requires that exposure be kept to a minimum.
■ Pyrophoric compounds may produce gastrointestinal damage resulting fromlocal generation of heat.
■ Symptoms of exposure may be delayed.
■ Considered an unlikely route of entry in commercial/industrial environments.

EYE

■ The material can produce chemical burns to the eye following direct contact. Vapors or mists may be extremely irritating.
■ If applied to the eyes, this material causes severe eye damage.
■ Pyrophoric compounds may produce thermal burns on contact with the eye.
■ Irritation of the eyes may produce a heavy secretion of tears (lachrymation).

SKIN

■ The material can produce chemical burns following direct contactwith the skin.
■ Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.
■ Pyrophoric compounds can produce irritation with a range of severity. Deep burns can occur in severe cases, with shock.
■ Reactions may not occur on exposure but response may be delayed with symptoms only appearing many hours later.
■ 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

■ If inhaled, this material can irritate the throat andlungs of some persons.
■ Inhalation of vapors or aerosols (mists, fumes), generated by the material during the course of normal handling, may be harmful.
■ Inhalation of vapours may cause drowsiness and dizziness. This may be accompanied by narcosis, reduced alertness, loss of reflexes, lack of coordination and vertigo.
■ Pyrophoric compounds may decompose giving rise to potent irritants of therespiratory tract.
■ Inhalation of quantities of liquid mist may be extremely hazardous, even lethal due to spasm, extreme irritation of larynx and bronchi, chemical pneumonitis and pulmonary edema.
■ The only signs during exposure to phosphine may be mild respiratory irritation although some victims report dyspnea, weakness, tremor and convulsions.
Phosphine is a very toxic gas. It appears to cause, chiefly, a depression of the central nervous system (CNS) and irritation of the lungs. Inhalation of phosphine causes restlessness, followed by tremors, fatigue, slight drowsiness, nausea, vomiting, cyanosis, pulmonary oedema, rapid pulse (tachycardia) low blood pressure (hypotension) and frequently, severe gastric pain and diarrhoea. There is often headache, thirst, dizziness, oppression in the chest and burning substernal pain; later the patient may become dyspneic and develop cough and sputum. Coma or convulsions may precede death.
Overexposure may cause tightness of chest and cough, headache, dizziness, nausea, vomiting, tremor, loss of coordination, diarrhoea. More severe poisoning may result in pulmonary oedema, cardiovascular collapse, cardiac dysrhythmias, myocardial injury, disordered liver function. Mortality from severe poisoning is high. Death has resulted from exposure to 8 ppm phosphine for 1-2 hours per day over several days. Asthma and inflammatory or fibrotic pulmonary disease will be aggravated.
Phosphine which is not eventually expired through the lungs may be metabolised to phosphate, hyposphosphite and phosphite and excreted in urine. Oxyhaemoglobin in mammals is converted by phosphine into a verdichromogen-like material through Fe3+-containg compounds. Birds exposed to phosphine exibited tonic-clonic convulsions; their organs were congested with oxygenated blood on exzmination. Similar effects were seen in cats, rabbits, rats and guinea pigs and death was attributed to respiratory paralysis followed by cardiac arrest.

CHRONIC HEALTH EFFECTS

■ Repeated or prolonged exposure to corrosives may result in the erosion of teeth, inflammatory and ulcerative changes in the mouth and necrosis (rarely) of the jaw. Bronchial irritation, with cough, and frequent attacks of bronchial pneumonia may ensue.
Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.
Chronic phosphine poisoning is said to resemble chronic phosphorus poisonings which produces stomach pains, vomiting and diarrhoea. Chronic poisoning, characterised by anemia, bronchitis, gastrointestinal disturbances and visual, speech and motor disturbances may result

from continued exposure to low concentrations.
Chronic exposure may produce systemic poisoning characterised by cachexia (general ill-health and malnutrition), anaemia, bronchitis, and necrosis of the mandible, the so-called "phossy" or Lucifer's" jaw. Other bones may also be involved as demonstrated by chronic systemic administration to animals which produces dense growth lines in all extremities proximal to the epiphyses (phosphoschicht).

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
triethylphosphine	554-70-1	>98
NOTE: Reacts with water or moisture to give		
phosphine	7803-51-2	

Section 4 - FIRST AID MEASURES

SWALLOWED
· For advice, contact a Poisons Information Center or a doctor at once. · Urgent hospital treatment is likely to be needed.

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. For THERMAL burns: · Do NOT remove contact lens · Lay victim down, on stretcher if available and pad BOTH eyes, make sure dressing does not press on the injured eye by placing thick pads under dressing, above and below the eye. · Seek urgent medical assistance, or transport to hospital.

SKIN
■ If skin or hair contact occurs: · Immediately flush body and clothes with large amounts of water, using safety shower if available. · Quickly remove all contaminated clothing, including footwear. In case of burns: · Immediately apply cold water to burn either by immersion or wrapping with saturated clean cloth. · DO NOT remove or cut away clothing over burnt areas. DO NOT pull away clothing which has adhered to the skin as this can cause further injury. · DO NOT break blister or remove solidified material. · Quickly cover wound with dressing or clean cloth to help prevent infection and to ease pain. · For large burns, sheets, towels or pillow slips are ideal; leave holes for eyes, nose and mouth. · DO NOT apply ointments, oils, butter, etc. to a burn under any circumstances. · Water may be given in small quantities if the person is conscious. · Alcohol is not to be given under any circumstances. · Reassure. · Treat for shock by keeping the person warm and in a lying position. · Seek medical aid and advise medical personnel in advance of the cause and extent of the injury and the estimated time of arrival of the patient.

INHALED
· If fumes or combustion products are inhaled remove from contaminated area. · Lay patient down. Keep warm and rested.

NOTES TO PHYSICIAN
■ For severe acute or short term repeated exposures to phosphine:
· There is no antidote. Clinical manifestations include headache, fatigue, nausea, vomiting, cough, dyspnea, parethesias, jaundice, ataxia, intention tremor, weakness and diplopia.
· i Care is supportive and all obviously symptomatic patients should be monitored in an intensive care setting. Watch for dysrhythmias. ii Replace fluids/electrolytes. iii Follow blood chemistries (calcium, phosphorus, glucose, prothrombin time, CBC) at least daily. iv Follow renal and hepatic function at least daily. Avoid any alcohol intake.

Section 5 - FIRE FIGHTING MEASURES

Vapour Pressure (mmHG):	Not available
Upper Explosive Limit (%):	Not available
Specific Gravity (water=1):	0.80
Lower Explosive Limit (%):	Not available

EXTINGUISHING MEDIA
■ For SMALL FIRES:
· Dry chemical, CO2, water spray or foam.
For LARGE FIRES:
· Foam, fog or water spray.

FIRE FIGHTING
· Wear SCBA and fully-encapsulating, gas-tight suits when handling these substances.
· Always wear thermal protective clothing when handling molten substances.
· Structural fire fighter's uniform will only provide limited protection.
· Alert Emergency Responders and tell them location and nature of hazard.
· Wear full body protective clothing with breathing apparatus.
When any large container (including road and rail tankers) is involved in a fire,
consider evacuation by 800 metres in all directions.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS
■ Ignites spontaneously in air (pyrophoric) and burns with intense heat.
· May ignite on contact with air leading to spontaneous combustion and burning rapidly.
· May decompose explosively when heated or involved in fire.

Combustion products include: carbon dioxide (CO_2), nitrogen oxides (NO_x), phosphorus oxides (PO_x), other pyrolysis products typical of burning organic material.
Dangerous when exposed to heat, flame or moisture.
Contact with water or moisture generates highly flammable and poisonous phosphine gas, and sufficient heat to ignite combustible materials.
Gas forms explosive mixtures with air over a wide area.

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 AB Filter of sufficient capacity

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS
· Eliminate all ignition sources.
· Cover with WET earth, sand or other non-combustible material.
· Use clean, non-sparking tools to collect absorbed material
· Wear gloves and safety glasses as appropriate.
MAJOR SPILLS
· Clear area of personnel and move upwind.
· Alert Emergency Responders and tell them location and nature of hazard.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

· DO NOT allow clothing wet with material to stay in contact with skin.
· For large scale or continuous use, spark-free, earthed ventilation system venting directly to the outside and separate from usual ventilation systems
· Provide dust collectors with explosion vents.
· Avoid all personal contact, including inhalation.
· Wear protective clothing when risk of overexposure occurs.
· Use in a well-ventilated area.
· Avoid smoking, naked lights or ignition sources.
· 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 and before re-use
· Use good occupational work practice.
· Observe manufacturer's storing/handling recommendations.
· Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.
NOTE: The material may remove oxygen from the air thus producing a severe hazard to workers inside enclosed or confined spaces where the material might accumulate. Before entry to such areas, sampling and test procedures for low oxygen levels should be undertaken; control conditions should be established to ensure the availability of adequate oxygen supply.

RECOMMENDED STORAGE METHODS

· Cylinder
· Ensure the use of equipment rated for cylinder pressure.
Normally stored under nitrogen in cylinders and dispensed using cylinder-outlet valve and transfer line.

STORAGE REQUIREMENTS

■ Store under an inert gas, e.g. argon or nitrogen.
· Store below 38 deg. C.
FOR MINOR QUANTITIES:
· Store in an indoor fireproof cabinet or in a room of noncombustible construction
· Provide adequate portable fire-extinguishers in or near the storage area.

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
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

Canada - Alberta Occupational Exposure Limits	phosphine (Phosphine)	0.3	0.4	1	1.4		
Canada - British Columbia Occupational Exposure Limits	phosphine (Phosphine)	0.3		1			
US - Minnesota Permissible Exposure Limits (PELs)	phosphine (Phosphine)	0.3	0.4	1	1		
US OSHA Permissible Exposure Levels (PELs) - Table Z1	phosphine (Phosphine)	0.3	0.4				
US ACGIH Threshold Limit Values (TLV)	phosphine (Phosphine)	0.3		1			TLV Basis: upper respiratory tract irritation; headache; gastrointestinal irritation; central nervous system impairment
US NIOSH Recommended Exposure Limits (RELs)	phosphine (Phosphine)	0.3	0.4	1	1		
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	phosphine (Phosphine)	0.3	0.4	1	1		
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	phosphine (Phosphine)	0.3	0.4				
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	phosphine (Phosphine)	0.3	0.4	1	1		
US - California Permissible Exposure Limits for Chemical Contaminants	phosphine (Phosphine; PH3)	0.3	0.4	1	1		
US - Idaho - Limits for Air Contaminants	phosphine (Phosphine)	0.3	0.4				
Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)	phosphine (Phosphine)	0.3	0.42	1	1.4		
Canada - Saskatchewan Occupational Health and Safety Regulations -	phosphine (Phosphine)	0.3		1			

Contamination Limits						
US - Hawaii Air Contaminant Limits	phosphine (Phosphine)	0.3	0.4	1	1.4	
US - Alaska Limits for Air Contaminants	phosphine (Phosphine)	0.3	0.4	1	1	
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	phosphine (Phosphine)	0.3	0.4	1	1	
US - Washington Permissible exposure limits of air contaminants	phosphine (Carbonyl chloride-(Phosgene))	0.1		0.3		
US - Washington Permissible exposure limits of air contaminants	phosphine (Phosphine)	0.3		1		
Canada - Nova Scotia Occupational Exposure Limits	phosphine (Phosphine)	0.3		1		TLV Basis: upper respiratory tract irritation; headache; gastrointestinal irritation; central nervous system impairment
Canada - Prince Edward Island Occupational Exposure Limits	phosphine (Phosphine)	0.3		1		TLV Basis: upper respiratory tract irritation; headache; gastrointestinal irritation; central nervous system impairment
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants	phosphine (Phosphine)	0.3	0.4			
US - Michigan Exposure Limits for Air Contaminants	phosphine (Phosphine)	0.3	0.4	1	1	
US - Oregon Permissible Exposure Limits (Z-1)	phosphine (Phosphine)	0.3	0.4			
Canada - Northwest Territories Occupational Exposure Limits (English)	phosphine (Phosphine)	0.3	0.42	1	1.3	

ENDOELTABLE

The following materials had no OELs on our records

- triethylphosphine: CAS:554-70-1

PERSONAL PROTECTION




RESPIRATOR
Type AB Filter of sufficient capacity
Consult your EHS staff for recommendations

EYE
· Chemical goggles.
· Full face shield.

HANDS/FEET
· When handling corrosive liquids, wear trousers or overalls outside of boots, to avoid spills entering boots.
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.
· Fire resistant/ heat resistant gloves where practical, otherwise
· Heavy-duty chemically resistant gloves capable of providing short-term protection against spontaneous ignition.

OTHER
■ Wear protective clothing appropriate for the work situation.
When handling liquids wear :
· non-sparking shoes,
· noncombustible or flameproof clothing.

ENGINEERING CONTROLS
■ General exhaust is adequate under normal operating conditions. If risk of overexposure exists, wear an approved respirator.
Inhalation risk of a pyrophoric material is low however risks of inhalation of combustion products may requires respiratory protection. It is recommended that this material be handled in a closed system or in a fume hood.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES
Liquid.

State	Liquid	Molecular Weight	118.16
Melting Range (°F)	Not available	Viscosity	Not Available
Boiling Range (°F)	260.6- 262.4	Solubility in water (g/L)	Reacts
Flash Point (°F)	1.004	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)	0.80
Lower Explosive Limit (%)	Not available	Relative Vapor Density (air=1)	>1
Volatile Component (%vol)	Not available	Evaporation Rate	Not available

APPEARANCE
Clear, colourless liquid with hyacinth-like odour; decomposes in water. Miscible with ether, methanol, ethanol and benzene.

Section 10 - CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY
· Presence of incompatible materials.
· May heat spontaneously
· Identify and remove sources of ignition and heating.

STORAGE INCOMPATIBILITY

■ Segregate from alcohol, water.
· Explosion hazard may follow contact with incompatible materials.
· Phosphine gas may react with certain metals and cause corrosion, especially at elevated temperatures and humidities.
· Metals such as copper, brass, and other copper alloys, aluminium and precious metals such as gold and silver are susceptible to corrosion by phosphine. Small electric motors smoke detectors, brass sprinkler heads, batteries and battery chargers, fork lifts, temperature monitoring systems, switching gears, communication devices, computers, calculators and other electrical equipment may be damaged by this gas.
· Phosphine will also react with certain metallic salts and therefore sensitive items such as photographic film, some inorganic pigments, etc., should not be exposed to the gas.
· Other incompatible materials include natural rubber, neoprene, polyethylene, PVC.
· Even small amounts of oxygen in phosphine give an explosive mixture in which autoignition occurs at low pressures.
· Pure phosphine does not spontaneously ignite in air below 150 deg. C. unless it is thoroughly dried, when it ignites in cold air. The presence of diphosphanes in phosphine as normally prepared causes it to ignite spontaneously in air, even below -15 deg. C. Traces of oxidants promote pyrophoricity (e.g dinitrogen trioxide, nitrous acid or similar oxidants).
· Lower flammability limit of pure phosphine in moist air (0.39 vol% water vapour) at 1037 mbar is 2.1% at 10 deg. C and 1.8% at 50 deg. C.
· Ignition occurs on contact of phosphine with chlorine or bromine or their aqueous solutions (hypochlorous or hypobromous acids).
· Passage of phosphine into silver nitrate solution causes ignition or explosion depending on gas rate.
· Interaction of phosphine with boron trichloride is energetic.
· Mercury(II) nitrate solution gives a complex phosphide, explosive when dry.
· In contact with chlorine, phosphine ignites at ambient temperatures.
Avoid reaction with oxidizing agents.
· NOTE: May develop pressure in containers; open carefully. Vent periodically.
Incompatible with oxygen and palladium(I) perchlorate.
Materials of construction restriction: Incompatible with aluminium, copper, copper alloys.

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

Section 11 - TOXICOLOGICAL INFORMATION

TRIETHYLPHOSPHINE

TOXICITY AND IRRITATION

■ unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.
■ Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production.

TRIETHYLPHOSPHINE:

■ No significant acute toxicological data identified in literature search.

Section 12 - ECOLOGICAL INFORMATION

May cause long-term adverse effects in the aquatic environment.
This material and its container must be disposed of as hazardous waste.

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
triethylphosphine	LOW		LOW	MED
phosphine	LOW		LOW	HIGH

Section 13 - DISPOSAL CONSIDERATIONS

US EPA Waste Number & Descriptions

A. General Product Information
Reactivity characteristic: use EPA hazardous waste number D003 (waste code R).
B. Component Waste Numbers
When phosphine 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 P096 (waste code T).

Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.
¦ 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 or consult manufacturer for recycling options.
· Consult Waste Management Authority for disposal.

Section 14 - TRANSPORTATION INFORMATION

DOT:
Symbols: G Hazard class or Division: 4.2
Identification Numbers: UN2845 PG: I
Label Codes: 4.2 Special provisions: B11, T22,
TP2, TP7
Packaging: Exceptions: None Packaging: Non- bulk: 181
Packaging: Exceptions: None Quantity limitations: Forbidden
Passenger aircraft/rail:
Quantity Limitations: Cargo Forbidden Vessel stowage: Location: D
aircraft only:
Vessel stowage: Other: 18
Hazardous materials descriptions and proper shipping names:
Pyrophoric liquids, organic, n.o.s.

Air Transport IATA:

ICAO/IATA Class: 4.2 ICAO/IATA Subrisk: None
UN/ID Number: 2845 Packing Group: -
Special provisions: None
Cargo Only
Packing Instructions: Forbidden Maximum Qty/Pack: Forbidden
Passenger and Cargo Passenger and Cargo
Packing Instructions: Forbidden Maximum Qty/Pack: Forbidden
Passenger and Cargo Limited Quantity Passenger and Cargo Limited Quantity
Packing Instructions: - Maximum Qty/Pack: -
Shipping Name: PYROPHORIC LIQUID, ORGANIC, N.O.S. *
†(CONTAINS TRIETHYLPHOSPHINE)

Maritime Transport IMDG:

IMDG Class: 4.2 IMDG Subrisk: None
UN Number: 2845 Packing Group: I
EMS Number: F-G , S-M Special provisions: 274
Limited Quantities: 0
Shipping Name: PYROPHORIC LIQUID, ORGANIC, N.O.S.

Section 15 - REGULATORY INFORMATION

triethylphosphine (CAS: 554-70-1) is found on the following regulatory lists;

"Canada Domestic Substances List (DSL)","US - California Air Toxics ""Hot Spots"" List (Assembly Bill 2588) Substances for which emissions must be quantified","US Toxic Substances Control Act (TSCA) - Inventory"

Regulations for ingredients

phosphine (CAS: 7803-51-2) is found on the following regulatory lists;

"Canada - Alberta Occupational Exposure Limits","Canada - British Columbia Occupational Exposure Limits","Canada - Northwest Territories Occupational Exposure Limits (English)","Canada - Nova Scotia Occupational Exposure Limits","Canada - Prince Edward Island Occupational Exposure Limits","Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)","Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits","Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances","Canada Domestic Substances List (DSL)","Canada Ingredient Disclosure List (SOR/88-64)","Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)","US - Alaska Limits for Air Contaminants","US - California Air Toxics ""Hot Spots"" List (Assembly Bill 2588) Substances for which emissions must be quantified","US - California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List","US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs)","US - California Permissible Exposure Limits for Chemical Contaminants","US - California Toxic Air Contaminant List Category II","US - Connecticut Hazardous Air Pollutants","US - Hawaii Air Contaminant Limits","US - Idaho - Limits for Air Contaminants","US - Massachusetts Oil & Hazardous Material List","US - Michigan Exposure Limits for Air Contaminants","US - Minnesota Hazardous Substance List","US - Minnesota Permissible Exposure Limits (PELs)","US - New Jersey Right to Know Hazardous Substances","US - Oregon Hazardous Materials","US - Oregon Permissible Exposure Limits (Z-1)","US - Pennsylvania - Hazardous Substance List","US - Rhode Island Hazardous Substance List","US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants","US - Vermont Hazardous Constituents","US - Vermont Hazardous Waste - Acutely Hazardous Wastes","US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants","US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants","US - Washington Dangerous waste constituents list","US - Washington Discarded Chemical Products List - ""P"" Chemical Products","US - Washington Permissible exposure limits of air contaminants","US - Wyoming List of Highly Hazardous Chemicals, Toxics and Reactives","US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants","US

ACGIH Threshold Limit Values (TLV)","US CERCLA Priority List of Hazardous Substances","US Clean Air Act - Hazardous Air Pollutants","US Department of Homeland Security Chemical Facility Anti-Terrorism Standards - Chemicals of Interest","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 Acute Exposure Guideline Levels (AEGLs) - Final","US EPA Carcinogens Listing","US EPCRA Section 313 Chemical List","US List of Lists - Consolidated List of Chemicals Subject to EPCRA, CERCLA and Section 112(r) of the Clean Air Act","US NFPA 45 Fire Protection for Laboratories Using Chemicals - Flammability Characteristics of Common Compressed and Liquefied Gases","US NIOSH Recommended Exposure Limits (RELs)","US OSHA List of Highly Hazardous Chemicals, Toxics and Reactives","US OSHA Permissible Exposure Levels (PELs) - Table Z1","US RCRA (Resource Conservation & Recovery Act) - Hazardous Constituents - Appendix VIII to 40 CFR 261","US RCRA (Resource Conservation & Recovery Act) - List of Hazardous Wastes","US SARA Section 302 Extremely Hazardous Substances","US Toxic Substances Control Act (TSCA) - Inventory","USA: Chemical Facility Anti-Terrorism Standards - List Appendix A - 6CFR 27"

Section 16 - OTHER INFORMATION

ND

Substance CAS Suggested codes triethylphosphine 554- 70- 1 phosphine 7803- 51- 2

Reasonable care has been taken in the preparation of this information, but the author makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The author makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use. For additional technical information please call our toxicology department on +800 CHEMCALL.

■ Classification of the preparation 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.

■ 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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