

Triphenylphosphine-copper(I) hydride Hexamer

sc-253780



The Power is Question

Material Safety Data Sheet

Hazard Alert Code Key:

EXTREME

HIGH

MODERATE

LOW

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

Triphenylphosphine-copper(I) hydride Hexamer

STATEMENT OF HAZARDOUS NATURE

CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

NFPA



SUPPLIER

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EMERGENCY:

ChemWatch
Within the US & Canada: 877-715-9305
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SYNONYMS

(C18-H16-CuP)₆, ((C₆H₅)₃PCuH)₆, "cuprous hydride triphenylphosphine hexamer"

Section 2 - HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS

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

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



CANADIAN WHMIS SYMBOLS



EMERGENCY OVERVIEW

RISK

Harmful if swallowed.

Irritating to eyes, respiratory system and skin.

Flammable.

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

■ Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.

■ A metallic taste, nausea, vomiting and burning feeling in the upper stomach region occur after ingestion of copper and its derivatives. The vomitus is usually green/blue and discolors contaminated skin.

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EYE

■ This material can cause eye irritation and damage in some persons.

■ Contact with the eye, by metal dusts, may produce mechanical abrasion or foreign body penetration of the eyeball.

■ Copper salts, in contact with the eye, may produce conjunctivitis or even ulceration and turbidity of the cornea.

SKIN

■ This material can cause inflammation of the skin oncontact in some persons.

■ The material may accentuate any pre-existing dermatitis condition.

■ Open cuts, abraded or irritated skin should not be exposed to this material.

■ Exposure to copper, by skin, has come from its use in pigments, ointments, ornaments, jewellery, dental amalgams and IUDs and as an antifungal agent and an algicide. Although copper algicides are used in the treatment of water in swimming pools and reservoirs, there are no reports of toxicity from these applications. Reports of allergic contact dermatitis following contact with copper and its salts have appeared in the literature, however the exposure concentrations leading to any effect have been poorly characterised. In one study, patch testing of 1190 eczema patients found that only 13 (1.1%) cross-reacted with 2% copper sulfate in petrolatum. The investigators warned, however, that the possibility of contamination with nickel (an established contact allergen) might have been the cause of the reaction. Copper salts often produce an itching eczema in contact with skin. This is, likely, of a non-allergic nature.

■ 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

■ The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage.

■ Inhalation of dusts, generated by the material during the course of normal handling, may be damaging to the health of the individual.

■ Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.

■ The inhalation of small particles of metal oxide results in sudden thirst, a sweet, metallic our foul taste, throat irritation, cough, dry mucous membranes, tiredness and general unwellness. Headache, nausea and vomiting, fever or chills, restlessness, sweating, diarrhea, excessive urination and prostration may also occur.

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■ Copper poisoning following exposure to copper dusts and fume may result in headache, cold sweat and weak pulse. Capillary, kidney, liver and brain damage are the longer term manifestations of such poisoning. Inhalation of freshly formed metal oxide particles sized below 1.5 microns and generally between 0.02 to 0.05 microns may result in "metal fume fever". Symptoms may be delayed for up to 12 hours and begin with the sudden onset of thirst, and a sweet, metallic or foul taste in the mouth. Other symptoms include upper respiratory tract irritation accompanied by coughing and a dryness of the mucous membranes, lassitude and a generalised feeling of malaise. Mild to severe headache, nausea, occasional vomiting, fever or chills, exaggerated mental activity, profuse sweating, diarrhoea, excessive urination and prostration may also occur. Tolerance to the fumes develops rapidly, but is quickly lost. All symptoms usually subside within 24-36 hours following removal from exposure.

CHRONIC HEALTH EFFECTS

■ Long-term exposure to respiratory irritants may result in disease of the airways involving difficult breathing and related systemic problems.

Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.

Copper has fairly low toxicity. Some rare hereditary conditions (Wilson disease or hepatolenticular degeneration) can lead to accumulation of copper on exposure, causing irreversible damage to a variety of organs (liver, kidney, CNS, bone, vision) and lead to death.

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Metallic dusts generated by the industrial process give rise to a number of potential health problems. The larger particles, above 5 micron, are nose and throat irritants.

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Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
triphenylphosphine/ copper(I) hydride hexamer	33636-93-0	>98

Section 4 - FIRST AID MEASURES

SWALLOWED

· IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY. · Where Medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise:

EYE

■ If this product comes in contact with the eyes: · Wash out immediately with fresh 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. · DO NOT attempt to remove particles attached to or embedded in eye. · 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 contact occurs: · Immediately remove all contaminated clothing, including footwear · Flush skin and hair with running water (and soap if available).

INHALED

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

NOTES TO PHYSICIAN

■ Treat symptomatically.

Copper, magnesium, aluminum, antimony, iron, manganese, nickel, zinc (and their compounds) in welding, galvanizing or smelting operations all give rise to thermally produced particulates of smaller dimension than might be produced if the metals are divided mechanically. Where insufficient ventilation or respiratory protection is available these particulates may produce "metal fume fever" in workers from an acute or long term exposure.

Section 5 - FIRE FIGHTING MEASURES

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

EXTINGUISHING MEDIA

■ Metal dust fires need to be smothered with sand, inert dry powders.

DO NOT USE WATER, CO2 or FOAM.

· DO NOT use halogenated fire extinguishing agents.

FIRE FIGHTING

· Alert Emergency Responders and tell them location and nature of hazard.

· Wear breathing apparatus plus protective gloves.

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

■ Combustion products include: carbon dioxide (CO₂), phosphorus oxides (PO_x), other pyrolysis products typical of burning organic material. With the exception of the metals that burn in contact with air or water (for example, sodium), masses of combustible metals do not represent unusual fire risks because they have the ability to conduct heat away from hot spots so efficiently that the heat of combustion cannot be maintained - this means that it will require a lot of heat to ignite a mass of combustible metal. Generally, metal fire risks exist when sawdust, machine shavings and other metal 'fines' are present.

· Metal powders, while generally regarded as non-combustible, may burn when metal is finely divided and energy input is high.

· May react explosively with water.

· May be ignited by friction, heat, sparks or flame.

· Metal dust fires are slow moving but intense and difficult to extinguish.

· Will burn with intense heat.

· DO NOT disturb burning dust. Explosion may result if dust is stirred into a cloud, by providing oxygen to a large surface of hot metal.

· Containers may explode on heating.

· Dusts or fumes may form explosive mixtures with air.

· May REIGNITE after fire is extinguished.

· Gases generated in fire may be poisonous, corrosive or irritating.

· DO NOT use water or foam as generation of explosive hydrogen may result.

FIRE INCOMPATIBILITY

· Reacts with acids producing flammable / explosive hydrogen (H₂) gas.

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

PERSONAL PROTECTION

Glasses:

Chemical goggles.

Gloves:

Respirator:

Particulate

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

- Remove all ignition sources.
 - DO NOT touch or walk through spilled material.
- 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

- Avoid all personal contact, including inhalation.
 - Wear protective clothing when risk of overexposure occurs.
- Empty containers may contain residual dust which has the potential to accumulate following settling. Such dusts may explode in the presence of an appropriate ignition source.
- Do NOT cut, drill, grind or weld such containers.
 - In addition ensure such activity is not performed near full, partially empty or empty containers without appropriate workplace safety authorisation or permit.

RECOMMENDED STORAGE METHODS

- CARE: Packing of high density product in light weight metal or plastic packages may result in container collapse with product release. Heavy gauge metal packages / Heavy gauge metal drums.
- For low viscosity materials and solids: 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.

STORAGE REQUIREMENTS

- 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.
- Air and moisture sensitive.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Notes
US - Minnesota Permissible Exposure Limits (PELs)	triphenylphosphine/ copper(I) hydride hexamer (Copper - Dusts and mists (as Cu))		1			
US - Minnesota Permissible Exposure Limits (PELs)	triphenylphosphine/ copper(I) hydride hexamer (Copper - Fume (as Cu))		0.1			
US ACGIH Threshold Limit Values (TLV)	triphenylphosphine/ copper(I) hydride hexamer (Copper - Fume (as Cu))		0.2			TLV Basis: irritation; GI; metal fume fever
US ACGIH Threshold Limit Values (TLV)	triphenylphosphine/ copper(I) hydride hexamer (Copper - Dusts and/or mists (as Cu))		1			TLV Basis: irritation; GI; metal fume fever
US - Idaho - Limits for Air Contaminants	triphenylphosphine/ copper(I) hydride hexamer (Copper - Fume (as Cu))		0.1			
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	triphenylphosphine/ copper(I) hydride hexamer (Copper - Fume (as Cu))		0.1			
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	triphenylphosphine/ copper(I) hydride hexamer (Copper - Dusts and mists (as Cu))		1			
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	triphenylphosphine/ copper(I) hydride hexamer (Copper - Dusts and mists (as Cu))		1			

US - Idaho - Limits for Air Contaminants	triphenylphosphine/ copper(I) hydride hexamer (Copper - Dusts and Mists (as Cu))		1		
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	triphenylphosphine/ copper(I) hydride hexamer (Copper - Fume (as Cu))		0.1		
US OSHA Permissible Exposure Levels (PELs) - Table Z1	triphenylphosphine/ copper(I) hydride hexamer (Copper - Dusts and mists (as Cu))		1		
US - Hawaii Air Contaminant Limits	triphenylphosphine/ copper(I) hydride hexamer (Copper - Dusts and mists (as Cu))		1		2
US - Oregon Permissible Exposure Limits (Z-1)	triphenylphosphine/ copper(I) hydride hexamer (Copper fume)		0.1		
US - Hawaii Air Contaminant Limits	triphenylphosphine/ copper(I) hydride hexamer (Copper - Fume (as Cu))		0.1		
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	triphenylphosphine/ copper(I) hydride hexamer (Copper - Fume)	-	0.2	-	0.2
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	triphenylphosphine/ copper(I) hydride hexamer (Copper - Dusts and mists (as Cu))	-	1	-	2
US - Oregon Permissible Exposure Limits (Z-1)	triphenylphosphine/ copper(I) hydride hexamer (Copper fume Dusts and Mists)		1		
Canada - Prince Edward Island Occupational Exposure Limits	triphenylphosphine/ copper(I) hydride hexamer (Copper - Dusts and/or mists (as Cu))		1		TLV Basis: irritation; GI; metal fume fever
US OSHA Permissible Exposure Levels (PELs) - Table Z1	triphenylphosphine/ copper(I) hydride hexamer (Copper - Fume (as Cu))		0.1		
Canada - Prince Edward Island Occupational Exposure Limits	triphenylphosphine/ copper(I) hydride hexamer (Copper - Fume (as Cu))		0.2		TLV Basis: irritation; GI; metal fume fever
Canada - Nova Scotia Occupational Exposure Limits	triphenylphosphine/ copper(I) hydride hexamer (Copper - Fume (as Cu))		0.2		TLV Basis: irritation; GI; metal fume fever
Canada - Nova Scotia Occupational Exposure Limits	triphenylphosphine/ copper(I) hydride hexamer (Copper - Dusts and/or mists (as Cu))		1		TLV Basis: irritation; GI; metal fume fever
US - California Permissible Exposure Limits for Chemical Contaminants	triphenylphosphine/ copper(I) hydride hexamer (Copper salts, dusts and mists, as Cu)		1		

ENDOELTABLE

PERSONAL PROTECTION



RESPIRATOR

Particulate

Consult your EHS staff for recommendations

EYE

- Safety glasses with side shields.
- Chemical goggles.

HANDS/FEET

■ 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.

· Protective gloves eg. Leather gloves or gloves with Leather facing.

Wear physical protective gloves, eg. leather.

OTHER

- Overalls.
- Eyewash unit.
- Some plastic personal protective equipment (PPE) (e.g. gloves, aprons, overshoes) are not recommended as they may produce static electricity.
- For large scale or continuous use wear tight-weave non-static clothing (no metallic fasteners, cuffs or pockets), non sparking safety footwear.

ENGINEERING CONTROLS

■ 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.

Metal dusts must be collected at the source of generation as they are potentially explosive.

· Vacuum cleaners, of flame-proof design, should be used to minimize dust accumulation.

· Metal spraying and blasting should, where possible, be conducted in separate rooms. This minimizes the risk of supplying oxygen, in the form of metal oxides, to potentially reactive finely divided metals such as aluminum, zinc, magnesium or titanium.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Solid.

State	Divided solid	Molecular Weight	1961.05
Melting Range (°F)	Not available	Viscosity	Not Applicable
Boiling Range (°F)	Not available	Solubility in water (g/L)	Reacts
Flash Point (°F)	Not available	pH (1% solution)	Not available
Decomposition Temp (°F)	Not available.	pH (as supplied)	Not applicable
Autoignition Temp (°F)	Not available	Vapour Pressure (mmHG)	Negligible
Upper Explosive Limit (%)	Not available.	Specific Gravity (water=1)	Not available
Lower Explosive Limit (%)	Not available	Relative Vapor Density (air=1)	Not Applicable
Volatile Component (%vol)	Negligible	Evaporation Rate	Not applicable

APPEARANCE

Red powder; reacts with water.

Section 10 - CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.

STORAGE INCOMPATIBILITY

- Many metals may incandesce, react violently, ignite or react explosively upon addition of concentrated nitric acid.
- Segregate from alcohol, water.
- Some metals can react exothermically with oxidizing acids to form noxious gases.

- Very reactive metals have been known to react with halogenated hydrocarbons, sometimes forming explosive compounds (for example, copper dissolves when heated in carbon tetrachloride).
- Many metals in elemental form react exothermically with compounds having active hydrogen atoms (such as acids and water) to form flammable hydrogen gas and caustic products.
- Elemental metals may react with azo/diazo compounds to form explosive products.
- Some elemental metals form explosive products with halogenated hydrocarbons.
- Reacts with acids producing flammable / explosive hydrogen (H₂) gas.

Avoid reaction with oxidizing agents.

- Finely divided metal powders develop pyrophoricity when a critical specific surface area is exceeded; this is ascribed to high heat of oxide formation on exposure to air.
- Safe handling is possible in relatively low concentrations of oxygen in an inert gas
- Several pyrophoric metals, stored in glass bottles have ignited when the container is broken on impact. Storage of these materials moist and in metal containers is recommended.
- The reaction residues from various metal syntheses (involving vacuum evaporation and co-deposition with a ligand) are often pyrophoric.
- Reacts slowly with water.
- CAUTION contamination with moisture will liberate explosive hydrogen gas, causing pressure build up in sealed containers.
- Reacts violently with caustic soda, other alkalies - generating heat, highly flammable hydrogen gas.
- If alkali is dry, heat generated may ignite hydrogen - if alkali is in solution may cause violent foaming.

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

Section 11 - TOXICOLOGICAL INFORMATION

TRIPHENYLPHOSPHINE/ COPPER(I) HYDRIDE HEXAMER

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.

No significant acute toxicological data identified in literature search.

Section 12 - ECOLOGICAL INFORMATION

This material and its container must be disposed of as hazardous waste.

Section 13 - DISPOSAL CONSIDERATIONS

US EPA Waste Number & Descriptions

A. General Product Information

Ignitability characteristic: use EPA hazardous waste number D001 (waste code I)

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.

For small quantities:

- Cautiously add the material to dry butanol in an appropriate solvent.
- Reaction may be vigorous and exothermic.

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. 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.
- Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal facility can be identified.

Section 14 - TRANSPORTATION INFORMATION

DOT:

Symbols: None Hazard class or Division: 4.1

Identification Numbers: UN3182 PG: III

Label Codes: 4.1 Special provisions: A1, IB4, T1, TP33

Packaging: Exceptions: 151 Packaging: Non- bulk: 213

Packaging: Exceptions: 151 Quantity limitations: 25 kg

Passenger aircraft/rail:

Quantity Limitations: Cargo 100 kg Vessel stowage: Location: E aircraft only:

Vessel stowage: Other: None

Hazardous materials descriptions and proper shipping names:

Metal hydrides, flammable, n.o.s.

Air Transport IATA:

ICAO/IATA Class: 4.1 ICAO/IATA Subrisk: None

UN/ID Number: 3182 Packing Group: III

Special provisions: A3

Cargo Only

Packing Instructions: 421 Maximum Qty/Pack: 100 kg

Passenger and Cargo Passenger and Cargo

Packing Instructions: 422 Maximum Qty/Pack: 25 kg

Passenger and Cargo Limited Quantity Passenger and Cargo Limited Quantity

Packing Instructions: Y422 Maximum Qty/Pack: 10 kg

Shipping Name: METAL HYDRIDES, FLAMMABLE, N.O.S. *(CONTAINS TRIPHENYLPHOSPHINE/ COPPER(I) HYDRIDE HEXAMER)

Maritime Transport IMDG:

IMDG Class: 4.1 IMDG Subrisk: None

UN Number: 3182 Packing Group: III

EMS Number: F-A, S-G Special provisions: 223 274

Limited Quantities: 5 kg

Shipping Name: METAL HYDRIDES, FLAMMABLE, N.O.S.(contains triphenylphosphine/ copper(I) hydride hexamer)

Section 15 - REGULATORY INFORMATION



REGULATIONS

triphenylphosphine/ copper(I) hydride hexamer (CAS: 33636-93-0) is found on the following regulatory lists;

"Canada - Nova Scotia Occupational Exposure Limits","Canada - Prince Edward Island Occupational Exposure Limits","Canada - Saskatchewan Industrial Hazardous Substances","Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances","Canada National Pollutant Release Inventory (NPRI)","US - California Air Toxics ""Hot Spots"" List (Assembly Bill 2588) Substances for which emissions must be quantified","US - California Environmental Health Standards for the Management of Hazardous Waste - List of Inorganic Persistent and Bioaccumulative Toxic Substances and Their STLC & TTLC Values","US - California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List","US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs)","US - California Toxic Air Contaminant List Category II","US - Hawaii Air Contaminant Limits","US - Idaho - Limits for Air Contaminants","US - Massachusetts Oil & Hazardous Material List","US - Minnesota Permissible Exposure Limits (PELs)","US - Oregon Permissible Exposure Limits (Z-1)","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 ACGIH Threshold Limit Values (TLV)","US CWA (Clean Water Act) - Priority Pollutants","US CWA (Clean Water Act) - Toxic Pollutants","US OSHA Permissible Exposure Levels (PELs) - Table Z1","US RCRA (Resource Conservation & Recovery Act) - Appendix IX to Part 264 Ground-Water Monitoring List 1","US RCRA (Resource Conservation & Recovery Act) - List of Hazardous Inorganic and Organic Constituents 1"

Section 16 - OTHER INFORMATION

LIMITED EVIDENCE

- Inhalation may produce health damage*.
- Cumulative effects may result following exposure*.

* (limited evidence).

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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