

# MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

## PART I *What is the material and what do I need to know in an emergency?*

### 1. PRODUCT IDENTIFICATION

**PRODUCT DESCRIPTION:** **BLACK RHODIUM SOLUTIONS - BATH and PEN**  
**TRADE NAME (AS LABELED):** This document applies to the following Cohler products:  
**Black Rhodium Bath Solution - Quarts, Pints, and Half-Pints**  
**Black Rhodium Pen Solution - Pen Pals<sup>®</sup>, 0.5 grams, 1 gram, 2 grams**

**CHEMICAL NAMES/CLASS:** Rhodium Plating Solution  
**SYNONYMS:** Not Applicable  
**PRODUCT USE:** Jewelry Plating  
**U.N. NUMBER:** UN 3264  
**U.N. DANGEROUS GOODS CLASS/SUBSIDIARY RISK:** 8 (Corrosive Material)  
**EUROPEAN E.C. CLASSIFICATION:** Corrosive (C)  
**HAZCHEM CODE (AUSTRALIA):** 2X  
**POISONS SCHEDULE NUMBER (AUSTRALIA):** Schedule 7

**U.S. SUPPLIER/MANUFACTURER'S NAME:** **COHLER ENTERPRISES, INC.**  
**ADDRESS:** 101 North Haven Street,  
Baltimore, MD 21224  
(410) 342-1400  
CHEMTREC, 800-424-9300 (from U.S.)  
01-703-527-3887 (Outside U.S.)  
**DATE OF PREPARATION/LAST REVISION:** April 28, 2002/May 1, 2005

### 2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	EINECS #	% w/w	EXPOSURE LIMITS IN AIR					
				ACGIH-TLV		OSHA-PEL		NIOSH	OTHER
				TWA mg/m <sup>3</sup>	STEL mg/m <sup>3</sup>	TWA mg/m <sup>3</sup>	STEL mg/m <sup>3</sup>		
Rhodium Sulfate Exposure limits are for Rhodium, Soluble Compounds, as Rh	10489-46-0	234-014-5	< 1	0.01	NE	0.001	NE	2 (as Rh)	NIOSH REL: TWA= 0.001
Arsenous Acid Exposure limits are for Arsenic & inorganic compounds, as As	1327-53-3	215-481-4	0.8-2	0.01 A1 ♦	NE	0.01	NE	5 (as As)	NIOSH REL: STEL = 0.002, 15 minutes (ceiling)
Stannous Sulfate Exposure limits are for Tin, inorganic compounds, as Sn	7488-55-3	231-302-2	2.5-4	2	NE	2	NE	NE	NIOSH REL: TWA = 2

NE = Not Established. See Section 16 for Definitions of Terms Used ♦ ACGIH-TLV A1(Carcinogen Defined with No Further Categorization)

NOTE (1): All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1998 format. This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR. NOTE (2): All European Community (EC) required information is included. This information is located in appropriate Sections based on the ANSI Z400.1-1998 format. NOTE (3): All Australian Worksafe required information is included, based on the ANSI Z400.1-1998 format.

## 2. COMPOSITION and INFORMATION ON INGREDIENTS (Continued)

CHEMICAL NAME	CAS #	EINECS #	% w/w	EXPOSURE LIMITS IN AIR					
				ACGIH-TLV		OSHA-PEL		NIOSH	OTHER
				TWA mg/m <sup>3</sup>	STEL mg/m <sup>3</sup>	TWA mg/m <sup>3</sup>	STEL mg/m <sup>3</sup>		
Sulfuric Acid	7664-93-9	231-639-5	< 7	1 NIC - 0.1 (Inhalable fraction)	3	1	NE	15	NIOSH REL: TWA = 1  DFG MAKs: TWA = 0.1 (Inhalable fraction); PEAK = 0.2 (ceiling)
Water and other components. Each of the other components are present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens.)			Balance	None of the other components contribute significant additional hazards at the concentrations present in this product. All pertinent hazard information has been provided in this document, per the requirements of the U.S. Federal Occupational Safety and Health Administration Standard (29 CFR 1910.1200), U.S. State equivalent Standards, the Canadian Workplace Materials Identification System Standards (CPR 4), applicable Directives of the European Economic Community (67/548 EEC; 93/112/EEC), and the Australian Workplace Safety regulations [NOHSC 1005 (1994)].					

## 3. HAZARD IDENTIFICATION

**EMERGENCY OVERVIEW:** This product is an amber to colloidal yellow liquid with an irritating odor. This product is toxic and corrosive. **Health Hazards:** The vapors and liquid of this solution are corrosive, extremely irritating and damaging to contaminated skin, eyes, mucous membranes and other exposed tissues, and can result in severe burns. Inhalation and ingestion exposures may be fatal. **Flammability Hazards:** This product is not flammable. If heated to decomposition, this solution may produce irritating fumes and toxic vapors (e.g., arsenic oxides, sulfur oxides, tin oxides). **Reactivity Hazards:** Negligible. **Environmental Hazards:** This product is corrosive and may be fatal to terrestrial animals, contaminated plants and aquatic life forms. In addition, arsenic solutions are considered to be toxic to aquatic environments. **Emergency Recommendations:** Emergency responders must wear proper personal protective equipment for the incident to which they are responding. Extreme caution must be used when responding to spills.

The image shows a GHS hazard pictogram for a chemical product. It features three main hazard categories: Health Hazard (3), Flammability (0), and Physical Hazard (1). Above these are icons for Skin, Respiratory, and Blood. Below the hazard categories is a Personal Protection section with a D hazard diamond and PPE symbols (goggles, gloves, and a respirator).

**SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE:** This product is a corrosive solution; liquid or vapors can rapidly damage exposed tissues. The severity of the effect depends on the concentration of the solution and the duration of contact. Specific symptoms of over-exposure to this product, via route of exposure, are as follows:

**INHALATION:** Inhalation overexposure to mists or sprays of this product can severely irritate and burn the nose, throat and respiratory tract. Symptoms of exposure may include difficulty in breathing, irritation and burns of mucous membranes, coughing, nasal congestion, and sore throat. Severe inhalation overexposure may result in chemical pneumonitis, pulmonary edema, and death. Symptoms of serious overexposure may be delayed. Severe inhalation exposure may also result in arsenic poisoning. Arsenic poisoning can cause weakness, headache, confusion, nausea, vomiting, convulsions, coma and death. Chronic inhalation of low concentration levels of this product may result in bronchitis.

**CONTACT WITH SKIN or EYES:** Depending on the duration of contact, overexposure to the skin by vapors or liquid, may cause reddening, discomfort, severe irritation and chemical burns. Chemical burns can blister the skin and leave scars. Repeated skin overexposure may cause dermatitis (red, cracked, irritated skin) and ulceration, depending on the concentration and duration of exposure. Contact with eyes may result in reddening, watering, severe irritation, burns, permanent scarring and/or blindness.

**SKIN ABSORPTION:** Skin absorption is not expected for any component of this product.

### 3. HAZARD IDENTIFICATION (Continued)

**INGESTION:** Although not anticipated to be a significant route of occupational over-exposure, ingestion of this product may be fatal. Swallowing this material may cause burns of the mouth, throat, esophagus, and other tissue. Symptoms can include difficulty swallowing, intense thirst, nausea, vomiting, diarrhea, and in severe cases, collapse and death. Aspiration of this product into the lungs during vomiting may cause serious lung injury. Ingestion of Arsenic compounds can lead to damage to the heart, liver, kidneys and blood system.

**INJECTION:** Although unlikely to occur during occupational use of this product, injection can cause pain, burning, or redness at point of injection and local tissue damage.

**HEALTH EFFECTS OR RISKS FROM EXPOSURE:** An Explanation in **Lay Terms**.

**ACUTE:** This product can severely irritate or burn contaminated tissue, or cause arsenic poisoning by all routes of exposure. Severe overexposure by all routes may be fatal. Injury to the lungs via inhalation may not be apparent for up to 48 hours. Eye contact will cause severe irritation or burns and may cause permanent blindness.

**CHRONIC:** Chronic inhalation may cause bronchitis. Repeated skin exposure may cause dermatitis. Arsenic compounds, such as Arsenous Acid, can also adversely affect the blood after repeated overexposures. Refer to Section 11 (Toxicological Information) for additional toxicity data.

**TARGET ORGANS:** ACUTE: Skin, eyes, respiration system. CHRONIC: Skin, respiratory system, blood. The Arsenous Acid component of this product is a suspect human carcinogen. See Section 11 (Toxicological Information) for additional information.

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## PART II *What should I do if a hazardous situation occurs?*

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### 4. FIRST-AID MEASURES

Victims of chemical exposure must be taken for medical attention. Rescuers should be taken for medical attention if necessary. Take copy of label and MSDS to physician or health professional, with victim. Physicians should refer to "Recommendations to Physicians" (located further in this Section) for further information.

**SKIN EXPOSURE:** If the product contaminates the skin, immediately begin decontamination with running water. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Minimum recommended flushing is for 15 minutes. DO NOT interrupt flushing. If consciousness of victim is impaired, oxygen should be administered. Victim and rescuers must seek immediate medical attention.

**EYE EXPOSURE:** If this product enters the eyes, open victim's eyes while under gentle running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. DO NOT interrupt flushing. Victim must seek immediate medical attention.

**INHALATION:** If vapors, mists, or sprays of this product are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. If consciousness of victim is impaired, oxygen should be administered. Remove or cover gross contamination to avoid exposure to rescuers. Victim must seek immediate medical attention.

**INGESTION:** If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. If professional advice is not available, do not induce vomiting. Have victim rinse mouth with water or give several cupfuls of water, if conscious. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or who cannot swallow. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. If consciousness is impaired, oxygen should be administered. Victim must seek immediate medical attention.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** Overexposure to this product may aggravate pre-existing respiratory, skin, and blood conditions.

**RECOMMENDATIONS TO PHYSICIANS:** Treat symptoms and eliminate exposure. Be observant for delayed pulmonary edema and signs of arsenic overexposure.

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## 5. FIRE-FIGHTING MEASURES

FLASH POINT: Not applicable.

AUTOIGNITION TEMPERATURE: Not applicable.

FLAMMABLE LIMITS (in air by volume, %):

Lower: Not Applicable.

Upper: Not Applicable.

FIRE EXTINGUISHING MATERIALS: Use suppression agents appropriate for surrounding areas. Direct fire suppression at burning materials.

Carbon Dioxide: YES    Foam: YES    Water Spray: YES (for cooling)

Dry Chemical: YES    Halon: YES    Other: Any "ABC" Class

UNUSUAL FIRE AND EXPLOSION HAZARDS: This solution is corrosive and presents a severe inhalation and contact hazard to fire-fighters. When involved in a fire, this material may decompose and produce irritating fumes and toxic gases (e.g. arsenic oxides, sulfur oxides, tin oxides).

Explosion Sensitivity to Mechanical Impact: Not sensitive.

Explosion Sensitivity to Static Discharge: Not sensitive.



NFPA RATING

SPECIAL FIRE-FIGHTING PROCEDURES: Incipient fire responders should wear eye protection. Structural fire fighters must wear Self-Contained Breathing Apparatus and full protective equipment. Chemical resistant clothing may be necessary. Responders must protect all downwind exposures from inhalation of caustic mist or vapors. Rinse fire response equipment with a triple rinse with water. Move fire-exposed containers from the area of the fire if it can be done without risk to fire-fighters. If possible, fire-fighters should control run-off water to prevent environmental contamination.

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## 6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a spill, clear the affected area, protect people, and respond with trained personnel.

For small releases, the minimum Personal Protective Equipment should be rubber gloves and rubber apron, splash goggles or safety glasses. Respiratory protection may be required. If necessary, use air-purifying respirator with acid gas cartridges. Refer to next paragraph if oxygen levels are below 19.5% or are unknown. In case of a non-incident spill, clear the affected area, protect people, and respond with trained personnel. Minimum Personal Protective Equipment should be **Level B: triple-gloves (rubber gloves and nitrile gloves, over latex gloves), chemically resistant suit and boots, hard-hat, and Self Contained Breathing Apparatus (SCBA)**. SCBA should be worn when oxygen levels are below 19.5% or are unknown. Absorb spilled liquid with polypads or other appropriate materials. Decontaminate the area thoroughly by rinsing with a sodium bicarbonate solution or other material appropriate for acids, followed by water. Use litmus paper to test area and ensure complete decontamination. If area is still acidic, use additional neutralization materials appropriate for acidic materials. Place all spill residue in a double plastic bag and seal. Dispose of in accordance with U.S. Federal, State, and local hazardous waste disposal regulations, those of Canada and its provinces, or the applicable standards of EC Member States or Australia (see Section 13, Disposal Considerations).

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## PART III *How can I prevent hazardous situations from occurring?*

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## 7. HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash hands after handling this product. Do not eat, smoke, drink or apply cosmetics while handling this product. All work practices should minimize the generation of splashes and mists and if present, avoid breathing. Use ventilation and other engineering controls to ensure exposure limits are below those stated in Section 2 (Composition and Information on Ingredients). If exposure occurs, remove and contaminated clothes immediately. Follow first-aid procedures provided in Section 4 (First-Aid Measures).

## 7. HANDLING and STORAGE (Continued)

STORAGE AND HANDLING PRACTICES: All employees who handle this material should be trained to handle it safely. Always use this product in well-ventilated areas. Ensure containers of this product are properly labeled. Open containers carefully, on a stable surface. Close containers tightly after use. When diluting this solution, slowly add the product to the water, to prevent splattering.

Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Store away from incompatible materials (see Section 10, Stability and Reactivity) and in secondary containment. Inspect all in-coming containers before storage, to ensure containers are properly labeled and not damaged. Periodically inspect containers of this product for leaks or damage. Empty containers may contain corrosive liquids or vapors. Therefore, empty containers should be handled with care.

STORAGE AND HANDLING PRACTICES: All employees who handle this material should be trained to handle it safely. Avoid breathing sprays or mists generated by this product. Always use this product in well-ventilated areas. Ensure containers of this product are properly labeled. Open containers carefully, on a stable surface. Close containers tightly after use. Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Store away from incompatible materials (see Section 10, Stability and Reactivity) and in secondary containment. Inspect all in-coming containers before storage, to ensure containers are properly labeled and not damaged. Keep container tightly closed when not in use. Protect from light. Periodically inspect containers of this product for leaks or damage. Storage containers should be made of corrosion-resistant materials. Read instructions provided with the product prior to use. Empty containers may contain corrosive liquids or vapors; therefore, empty containers should be handled with care.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Response) above and in Section 8 (Exposure Controls - Personal Protection). Make certain equipment is locked- and tagged-out safely. Always use this product in areas where adequate ventilation is provided. Decontaminate equipment with an acid-neutralizing agent (followed by water rinse) before maintenance begins. Collect all waste materials, including rinsates, and dispose of according to applicable U.S. Federal, State, or local procedures and those of Canada and its provinces, or the applicable Standard of EC Member States or regulations of Australia. Remove contaminated clothing and launder prior to reuse.

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## 8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation to ensure exposures are below the limits provided in Section 2 (Composition and Information on Ingredients). Use a corrosion-resistant exhaust system. Eye-wash/safety shower stations should be near locations in which this product is stored or handled. If necessary, refer to U.S. OSHA Standards, Canadian WHMIS Standards, EC Directives, and Australian National Code of Practice for the Control of Workplace Hazardous Substances [NOHSC: 2007 (1994)] regarding ventilation standards.

RESPIRATORY PROTECTION: Maintain airborne contaminant concentrations below guidelines listed in Section 2 (Composition and Information on Ingredients). If respiratory protection is needed (i.e., an air-purifying respirator with appropriate cartridge for use with arsenic solutions), use only protection authorized in the U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134) or applicable U.S. State Standards, Canadian CSA Standard Z94.4-93, the European Standard EN 149, equivalent EC Member State Standards, the Australian Standard 1716-Respiratory Protective Devices, or Australian Standard 1715-Selection, Use, and Maintenance of Respiratory Protective Devices. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full-facepiece, supplied-air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Standard (1910.124-1998). The following are NIOSH respiratory protection guidelines for Sulfuric Acid :

SULFURIC ACID  
CONCENTRATION  
Up to 15 mg/m<sup>3</sup> :

RESPIRATORY PROTECTION

Any Supplied-Air Respirator (SAR) operated in a continuous-flow mode; any Powered, Air-Purifying Respirator (PAPR) with acid gas cartridge(s) in combination with a high-efficiency particulate (HEPA) filter; any chemical cartridge respirator with a full facepiece and acid gas cartridge(s) in combination with a HEPA filter; any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted acid gas canister having a HEPA filter; any Self-Contained Breathing Apparatus (SCBA) with a full facepiece; or any SAR with a full facepiece.

## 8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)

**Emergency or Planned Entry into Unknown Concentrations or IDLH Conditions:** Any SCBA that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode or any SAR that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary SCBA operated in pressure-demand or other positive-pressure mode.

**Escape:** Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted acid gas canister having a HEPA filter or any (appropriate escape-type, SCBA).

**EYE PROTECTION:** Splash goggles or safety glasses should be used for routine operations. Face-shield should be worn when working with more than 1 gallon of this product or during operations in which mists or sprays may be generated, or during clean-up of spills of this product. If necessary, refer to U.S. OSHA Standard 29 CFR 1910.133, or the European Standard EN 166, or the Australian Standard 1337-Eye Protection for Industrial Applications and Australian Standard 1336-Recommended Practices for Eye Protection in the Industrial Environment for further information.

**HAND PROTECTION:** Wear latex gloves for routine use. Use triple gloves for spill response, as stated in Section 6 (Accidental Release Measures) of this MSDS. If necessary, refer to Australian Standard 2161-Industrial Safety Gloves and Mittens for further information.

**BODY PROTECTION:** Use rubber apron for routine use. If necessary, refer to Australian Standard 3765-Clothing for Protection Against Hazardous Chemicals for further information.

**HMIS PERSONAL PROTECTIVE EQUIPMENT LEVEL:** D (gloves, goggles, face-shield, body protection).

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## 9. PHYSICAL and CHEMICAL PROPERTIES

**RELATIVE VAPOR DENSITY (air=1):** Not available.

**SPECIFIC GRAVITY (water=1):** 1.0

**SOLUBILITY IN WATER:** Soluble.

**VAPOR PRESSURE, mm Hg @ 20°C:** Not available.

**ODOR THRESHOLD:** Not available.

**APPEARANCE, ODOR AND COLOR:** Amber to colloidal yellow liquid with an irritating odor.

**HOW TO DETECT THIS SUBSTANCE (warning properties):** pH paper will turn red when exposed to this solution.

**EVAPORATION RATE (water 1):** Similar to water.

**FREEZING/MELTING POINT:** Not available.

**BOILING POINT:** Not available.

**pH:** 1

**WATER/OIL DISTRIBUTION COEFFICIENT:** Not available.

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## 10. STABILITY and REACTIVITY

**STABILITY:** Stable at normal temperature and pressure. Exposure to light may cause this product to discolor.

**DECOMPOSITION PRODUCTS:** When heated to decomposition, this product can emit arsenic oxides, sulfur oxides, tin oxides.

**MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE:** Strong oxidizers, water-reactive materials.

**HAZARDOUS POLYMERIZATION:** Will not occur.

**CONDITIONS TO AVOID:** Avoid exposure to incompatible materials or to extreme heat and light.

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## PART IV *Is there any other useful information about this material?*

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## 11. TOXICOLOGICAL INFORMATION

**TOXICITY DATA:** Though toxicity data for this product have not been established, the following provides toxicity data on components of this product that are in concentration of 1% or greater:

**SULFURIC ACID:**

Cytogenetic Analysis (ovary, hamster) = 4 mmol/L

Standard Draize Test (eye, rabbit) = 250 g; severe

Eye IRRITANCY (rabbit) = 5 mg/30 seconds/rinsed; severe

TCLo (inhalation, human) = 3 mg/m<sup>3</sup>/24 weeks; Musculoskeletal: changes in teeth and supporting structures

TCLo (inhalation, rat) = 784 g/m<sup>3</sup>/24 hours/84 days/continuous; Behavioral: muscle contraction or spasticity, Kidney, Urethra, Bladder: other changes in urine composition; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: true cholinesterase

TCLo (inhalation, dog) = 900 g/m<sup>3</sup>/21 hours/89 weeks/intermittent; Cardiac: changes in heart weight; Lungs, Thorax, or Respiration: other changes; Lungs, Thorax, or Respiration: changes in lung weight

TCLo (inhalation, monkey) = 2 mg/m<sup>3</sup>/23 hours/78 weeks/intermittent; Lungs, Thorax, or Respiration: other changes

TCLo (inhalation, guinea pig) = 30 mg/m<sup>3</sup>/7 days/continuous; Lungs, Thorax, or Respiration: acute pulmonary edema; Related to Chronic Data: death

TCLo (inhalation, rabbit) = 20 mg/m<sup>3</sup>/7 hours/female 6–18 days after conception; Reproductive: Specific Developmental Abnormalities: musculoskeletal system

LDLo (unreported, man) = 135 mg/kg

LD<sub>50</sub> (oral, rat) = 2140 mg/kg

LC<sub>50</sub> (inhalation, rat) = 510 mg/m<sup>3</sup>/2 hours

LC<sub>50</sub> (inhalation, mouse) = 320 mg/m<sup>3</sup>/2 hours

LC<sub>50</sub> (inhalation, guinea pig) = 18 mg/m<sup>3</sup>; Lungs, Thorax, or Respiration: other changes

# 11. TOXICOLOGICAL INFORMATION (Continued)

## ARSENOUS ACID:

TDLo (Oral-Woman) 100 mg/kg: Cardiac: EKG changes not diagnostic of specified effects; Vascular: BP lowering not characterized in autonomic section; Gastrointestinal: nausea or vomiting...

TDLo (Oral-Man) 114 mg/kg: Behavioral: muscle weakness; Lungs, Thorax, or Respiration: acute pulmonary edema; Kidney, Ureter, Bladder: urine volume decreased

TDLo (Oral-Woman) 549 mg/kg: Lungs, Thorax, or Respiration: other changes; Gastrointestinal: nausea or vomiting; Blood: changes in bone marrow (not otherwise specified)

LDLo (Oral-Man) 29 mg/kg: Behavioral: sleep; Behavioral: muscle weakness; Gastrointestinal: hypermotility, diarrhea

LDLo (Oral-Man) 286 mg/kg: Cardiac: arrhythmias (including changes in conduction); Liver: liver function tests impaired; Musculoskeletal: other changes

TDLo (Oral-Man) 14,857 mg/kg: Sense Organs and Special Senses (Eye): visual field changes; Gastrointestinal: hypermotility, diarrhea; Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol)

LDLo (Oral-Human) 1429 mg/kg

LDLo (Oral-Man) 2857 mg/kg : Behavioral: coma; Liver: fatty liver degeneration; Kidney, Ureter, Bladder: renal function tests depressed

LDLo (Oral-Man) 123 mg/kg: Brain and Coverings: other degenerative changes; Gastrointestinal: nausea or vomiting; Liver: other changes

## ARSENOUS ACID (continued):

TDLo (Oral-Woman) 20 mg/kg: Gastrointestinal: nausea or vomiting, other changes; Liver: jaundice (or hyperbilirubinemia) hepatocellular

LDLo (Unreported-Man) 2941 mg/kg

LD<sub>50</sub> (Oral-Rat) 14,600 mg/kg

## STANNOUS SULFATE:

LD<sub>50</sub> (Oral-Rat) 2207 mg/kg

LD<sub>50</sub> (Oral-Mouse) 2152 mg/kg

TDLo (Oral-Rat) 9119 mg/kg/4 weeks-continuous: Blood: pigmented or nucleated red blood cells; Nutritional and Gross Metabolic: weight loss or decreased weight gain, changes in iron

TDLo (Oral-Rat) 29637 mg/kg/13 weeks-continuous: Blood: pigmented or nucleated red blood cells; Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol); Nutritional and Gross Metabolic: weight loss or decreased weight gain

TCLo (Inhalation-Rat) 290 mg/m<sup>3</sup>/24 hours: female 1-22 day(s) after conception: Reproductive: Effects on Embryo or Fetus: fetal death;

Fertility: pre-implantation mortality (e.g. reduction in number of implants per female; total number of implants per corpora lutea), post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants)

**SUSPECTED CANCER AGENT:** Components of this product are listed agencies by tracking carcinogenic potential as follows:

**ARSENOUS ACID:** ACGIH-TLV A1(Carcinogen Defined with No Further Categorization), EPA-A (Human Carcinogen), IARC-1 (Carcinogenic to Humans), MAK-1 (Substances that Cause Cancer in Man and Can Be Assumed to Make a Significant Contribution to Cancer Risk), NIOSH-Ca (Potential Occupational Carcinogen, with No Further Categorization), NTP-K (Known to Be a Human Carcinogen), OSHA-Ca (Carcinogen with No Further Categorization)

The remaining components of this product are not found on the lists of the following agencies tracking carcinogenic potential, U.S. FEDERAL OSHA Z LIST, NTP, CAL/OSHA, and are therefore not considered to be or suspected to be cancer-causing agents by these agencies.

**IRRITANCY OF PRODUCT:** This product is severely irritating and corrosive to contaminated tissue.

**SENSITIZATION TO THE PRODUCT:** No component of this product is known to cause human skin or respiratory sensitization.

**REPRODUCTIVE TOXICITY INFORMATION:** Listed below is information concerning the effects of this product and its components on the human reproductive system.

**Mutagenicity:** This product is not reported to produce mutagenic effects in humans. Mutation data are available for the Arsenous Acid component of this product; these data were obtained during clinical studies on specific human or animal tissues exposed to high doses of these compounds.

**Embryotoxicity:** This product is not reported to produce embryotoxic effects in humans.

**Teratogenicity:** This product is not reported to produce teratogenic effects in humans.

**Reproductive Toxicity:** This product is not reported to produce reproductive effects in humans. Clinical studies on test animals exposed to relatively high doses of the Arsenic Acid and Stannous Sulfate components of this product indicate adverse reproductive effects.

*A **mutagen** is a chemical that causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An **embryotoxin** is a chemical that causes damage to a developing embryo (i.e., within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A **teratogen** is a chemical that causes damage to a developing fetus, but the damage does not propagate across generational lines. A **reproductive toxin** is any substance that interferes in any way with the reproductive process.*

**BIOLOGICAL EXPOSURE INDICES:** The following Biological Exposure Indices (BEIs) are available for the components of this product.

ARSENIC, ELEMENTAL and SOLUBLE INORGANIC COMPOUNDS: Determinant - Inorganic arsenic plus methylated metabolites in urine; Sampling time-End of workweek; BEI - 35µg As/L; Notation-Background

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## 12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

**ENVIRONMENTAL STABILITY:** This product will react with a wide variety of materials in the environment. The primary effects on plant, aquatic, or animal life would be caused by the low Ph of the material. Arsenic can persist in the environment.

## 12. ECOLOGICAL INFORMATION (Continued)

EFFECT OF PRODUCT ON PLANTS or ANIMALS: The exact effects depend on the extent of exposure. Lowered pH can be harmful or fatal to animal life. Arsenic compounds can have long-term effects on contaminated plants and animals; refer to Section 11 (Toxicology Information) for studies of exposed test animals for additional data.

EFFECT OF PRODUCT ON AQUATIC LIFE: Spills of large amounts of this material into water could lower pH sufficiently to be harmful or fatal to aquatic life in contaminated bodies of water. Additionally, the long-term effects of arsenic in a body of water can have severe, detrimental effects on aquatic plants and animals.

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## 13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Precious metal recovery can be considered as a potential waste-handling option. Otherwise, disposal must be in accordance with appropriate U.S. Federal, State, and local regulations or those of Canada and its Provinces. This chemical, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority.

EPA WASTE NUMBER: D002 (Characteristic, corrosive) and D004 (Characteristic, toxicity, arsenic - 5.0 mg/L): applicable to wastes consisting only of this product.

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## 14. TRANSPORTATION INFORMATION

**THIS MATERIAL IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.**

PROPER SHIPPING NAME: Corrosive liquid, acidic, inorganic, n.o.s. (Sulfuric Acid, Arsenous Acid)  
HAZARD CLASS NUMBER and DESCRIPTION: 8 (Corrosive Material)  
UN IDENTIFICATION NUMBER: UN 3264  
PACKING GROUP: II  
DOT LABEL(S) REQUIRED: Limited Quantity  
NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000): 154  
MARINE POLLUTANT: No component of this product is listed as a Marine Pollutant by the D.O.T. (49 CFR 172.101, Appendix B).

**NOTE: The following Department of Transportation regulations apply specifically to these Cohler products.**

0.5 grams: These products are shipped in volumes of less than 30 mL. They therefore meet the requirements for Small Quantity Exception (49 CFR 173.4).

All Other Products: These products are shipped in volumes not over 1 liter. They therefore meet the Limited Quantity Exception for corrosive material (49 CFR 173.154). Per this regulation: *Limited quantities of corrosive materials (Class 8) in Packing Groups II are exempted from labeling, unless offered or intended for transportation by aircraft, and specification packaging requirements when packaged in appropriate combination packagings. In addition, shipments of these limited quantities are not subject to subpart F (Placarding) of part 172. Each package must conform to the packaging requirements of subpart B of this part and may not exceed 30 kg (66 pounds) gross weight. The following combination packagings are authorized: For corrosive materials in Packing Group II, in inner packagings not over 1.0 L (0.3 gallon) net capacity each for liquids or not over 1.0 kg (2.2 pounds) net capacity each for solids, packed in strong outer packagings.*

**UPS GUIDE FOR SHIPPING GROUND and AIR HAZARDOUS MATERIALS:**

PROPER SHIPPING NAME: Corrosive liquid, acidic, inorganic, n.o.s. (Sulfuric Acid, Arsenous Acid)  
HAZARD CLASS NUMBER and DESCRIPTION: 8 (Corrosive Material)  
UN IDENTIFICATION NUMBER: UN 3264  
PACKING GROUP: II  
DOT LABEL(S) REQUIRED: Ground: Limited Quantity; Air: Corrosive  
AIR MAXIMUM NET QUANTITY: 1 Liter

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This product is considered as dangerous goods, per regulations of Transport Canada. Use the above U.S. information for the preparation of Canadian shipments.



## 14. TRANSPORTATION INFORMATION

**INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA) DESIGNATION:** This product is considered as dangerous goods, per rules of the International Air Transport Association.

**PROPER SHIPPING NAME:** Corrosive liquid, acidic, inorganic, n.o.s. (Sulfuric Acid, Arsenous Acid)  
**HAZARD CLASS NUMBER and DESCRIPTION:** 8 (Corrosive)  
**UN IDENTIFICATION NUMBER:** UN 3264  
**PACKING GROUP:** II  
**HAZARD LABEL(S) REQUIRED:** Class 8 (Corrosive)  
**ERG CODE NUMBER:** 8L

The following Packaging Information is applicable to this product:

PROPER SHIPPING NAME	PASSENGER AND CARGO AIRCRAFT				CARGO AIRCRAFT ONLY	
	Limited Quantity		Pkg Instruction	Max. Qty. per Pkg.	Pkg Instruction	Max. Qty. per Pkg.
	Pkg Instruction	Max. Qty. per Pkg.				
Corrosive liquids, acidic, inorganic, n.o.s. (Sulfuric Acid, Arsenous Acid)	Y808	0.5 L	808	1 L	812	30 L

**INTERNATIONAL MARITIME ORGANIZATION (IMO):** This product is considered as dangerous goods under IMO rules, as follows:

**PROPER SHIPPING NAME:** Corrosive liquid, acidic, inorganic, n.o.s. (Sulfuric Acid, Arsenous Acid)  
**HAZARD CLASS NUMBER and DESCRIPTION:** 8 (Corrosive)  
**UN IDENTIFICATION NUMBER:** UN 3264  
**PACKING GROUP:** II  
**HAZARD LABEL(S) REQUIRED:** Class 8 (Corrosive)  
**STOWAGE CATEGORY:** Category B: Clear of Living Quarters  
**MARINE POLLUTANT:** Arsenic solutions are designated by the IMO to be Marine Pollutants.  
**LIMITED QUANTITY:** Under IMO regulations, the limited quantity for Packing Group II materials is 500 mL.  
**PACKING INSTRUCTION:** P001

**EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (ADR):**

**SUBSTANCE IDENTIFICATION NUMBER:** Corrosive liquids, acidic, inorganic, n.o.s. (Sulfuric Acid, Arsenous Acid)  
**U.N. NUMBER:** 3264  
**NAME OF SUBSTANCE:** 8 (Corrosive)  
**HAZARD IDENTIFICATION NUMBER:** 86  
**LABEL:** Corrosive  
**CLASS AND ITEM NUMBER:** 8, 66°, (b)

**AUSTRALIAN FEDERAL OFFICE OF ROAD SAFETY CODE FOR THE TRANSPORTATION OF DANGEROUS GOODS BY ROAD OR RAIL:** This material is considered as dangerous goods, per regulations of the Federal Office of Road Safety, as follows:

**U.N. NUMBER:** 3264  
**NAME OF SUBSTANCE:** Corrosive liquids, acidic, inorganic, n.o.s. (Sulfuric Acid, Arsenous Acid)  
**HAZARD CLASS:** 8 (Corrosive)  
**PACKING GROUP:** II  
**HAZCHEM:** 2X  
**PACKING CODE:** 3.8.8  
**SPECIAL PROVISIONS:** 109, 129, 274

## 15. REGULATORY INFORMATION

### ADDITIONAL U.S. REGULATIONS:

**SARA REPORTING REQUIREMENTS:** The components of this product are subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act, as follows.

CHEMICAL NAME	SARA 302 (40 CFR 355, Appendix, A)	SARA 304 (40 CFR Table 302.4)	SARA 313 (40 CFR 372.65)
Arsenous Acid	Yes	Yes	Yes
Sulfuric Acid	Yes	Yes	No

**U.S. SARA THRESHOLD PLANNING QUANTITY:** Arsenous Acid = 100 lb (45.4 kg), Sulfuric Acid = 1000 lb (454 kg)

**U.S. CERCLA REPORTABLE QUANTITY:** Arsenous Acid = 1 lb (0.45 kg), Sulfuric Acid = 1000 lb (454 kg)

**U.S. TSCA INVENTORY STATUS:** The components in this product are listed on the TSCA Inventory.

**U.S. STATE REGULATORY INFORMATION:** The following components of this product are covered under specific State regulations:

**Alaska - Designated Toxic and Hazardous Substances:** Arsenous Acid, Sulfuric Acid

**California - Permissible Exposure Limits for Chemical Contaminants:** Sulfuric Acid

**Florida - Substance List:** No.

**Illinois - Toxic Substance List:** Sulfuric Acid.

**Kansas - Section 302/313 List:** Sulfuric Acid.

**Massachusetts - Substance List:** Arsenous Acid, Sulfuric Acid

**Michigan - Critical Materials Register:** Arsenous Acid.

**Minnesota - List of Hazardous Substances:** Arsenous Acid, Sulfuric Acid

**Missouri - Employer Information/Toxic Substance List:** Arsenous Acid, Sulfuric Acid

**New Jersey - Right to Know Hazardous Substance List:** Arsenous Acid., Sulfuric Acid

**North Dakota - List of Hazardous Chemicals and Reportable Quantities:** Arsenous Acid., Sulfuric Acid

**Pennsylvania - Hazardous Substance List:** Arsenous Acid, Sulfuric Acid.

**Rhode Island - Hazardous Substance List:** Arsenous Acid, Sulfuric Acid

**Texas - Hazardous Substance List:** Sulfuric Acid.

**West Virginia - Hazardous Substance List:** Sulfuric Acid

**Wisconsin - Toxic and Hazardous Substances:** Sulfuric Acid.

**CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65):** Arsenous Acid (as Arsenic Compounds, Inorganic) is on the California Proposition Lists as a compound known to to the State of California to cause cancer.

**ANSI LABELING [Z129.1] (Precautionary Statements):** **DANGER!** CAUSES SEVERE SKIN AND EYE BURNS. MAY CAUSE BURNS TO RESPIRATORY TRACT. MAY BE HARMFUL OR FATAL IF SWALLOWED. CANCER HAZARD -- CONTAINS MATERIAL THAT CAN CAUSE CANCER. CONTACT WITH WATER MAY GENERATE HEAT. Do not get in eyes, on skin, or on clothing. Avoid breathing mist or vapor. Wash thoroughly after handling. **FIRST-AID: In case of contact:** Immediately flush eyes or skin with running water for at least 15 minutes while removing contaminated clothing and shoes. **If inhaled:** Remove to fresh air. If breathing is labored, give oxygen. **If swallowed:** DO NOT induce vomiting. Get medical attention immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person. **For additional aid:** Contact the U.S. Poison Control Center at 1-800-222-1222. **Notes to physicians:** Be observant for symptoms of arsenic poisoning and pulmonary edema. **GET MEDICAL ATTENTION IMMEDIATELY. In Case of Fire:** Use water fog, dry chemical, carbon dioxide, or alcohol foam. **In Case of Spill:** Use personal protective equipment. Contain and absorb spill with inert material (e.g., polypads), then place in a suitable container. Neutralize residue with sodium bicarbonate. **Storage and Handling:** Use gloves, safety goggles, face shield and appropriate body protection. Use with adequate ventilation. Avoid unintentional contact with water. Keep container closed. Store in cool, dry place away from sources of intense heat or where freezing is possible. Store away from incompatible chemicals (e.g., strong oxidizers, strong bases, water-reactive materials). **FOR INDUSTRIAL USE ONLY. KEEP OUT OF REACH OF CHILDREN. REFER TO MATERIAL SAFETY DATA SHEET FOR ADDITIONAL INFORMATION.**

### ADDITIONAL CANADIAN REGULATIONS:

**CANADIAN DSL/NDL INVENTORY STATUS:** The components of this product are on the DSL Inventory.

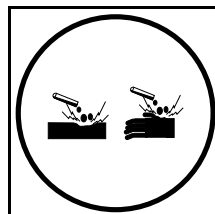
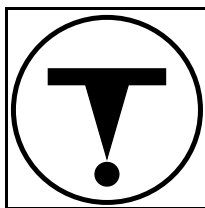
**CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS:** The components of this product are not on the CEPA Priorities Substances Lists.

## 15. REGULATORY INFORMATION (Continued)

### ADDITIONAL CANADIAN REGULATIONS:

#### CANADIAN WHMIS SYMBOLS:

**D1A, D2A:** Material Causing Other Toxic Effects - Acute Effects, Chronic Effects  
**E:** Corrosive Material



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

### EUROPEAN COMMUNITY INFORMATION FOR PRODUCT:

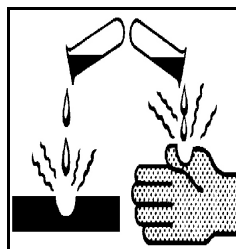
**EC LABELING AND CLASSIFICATION:** This product is classified as Corrosive, Toxic and Dangerous for the Environment [C, T, N] under European Community Council Directive 67/548/EEC as follows:

**EC CLASSIFICATION:** Corrosive. Toxic. Dangerous for the Environment [C, T, N]

**EC RISK PHRASES:** Toxic by inhalation and if swallowed. Causes burns. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. [R:23/25-35-50/53]

**EC SAFETY PHRASES:** Keep locked-up and out of reach of children. (*This safety phrase may be omitted for preparations sold for industrial use only*). Keep container tightly closed. In case of contact with eyes, rinse immediately with water and seek medical advice. Do not empty into drains. Wear suitable protective clothing, gloves, and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). This material and/or its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/safety data sheet. [S: (½-)7-26-29-36/37/39-45 60 61]

#### EUROPEAN COMMUNITY ANNEX II HAZARD SYMBOL:



#### EC INFORMATION FOR COMPONENTS:

##### **Arsenous Acid (as an arsenic compound):**

EINCES NUMBER: 215-481-4

EC CLASSIFICATION: Toxic; Dangerous for the environment. [T;N]

EC RISK PHRASES: Toxic by inhalation and if swallowed. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. [R:23/25-50/53]

EC SAFETY PHRASES: Keep locked up and out of the reach of children. (*This safety phrase may be omitted for preparations sold for industrial use only*). When using do not eat, drink or smoke. After contact with skin, wash immediately with plenty of (to be specified by the manufacturer). In case of accident or if you feel unwell, seek medical advice immediately (show label where possible). This material and/or its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/safety data sheet. [S:(½-)\*20/21-28-45-60-61]

##### EC COMMENTS:

CONCENTRATION GREATER THAN OR EQUAL TO 0.2%: Toxic. Toxic by inhalation and if swallowed. [T;R:23/25]

CONCENTRATION GREATER THAN OR EQUAL TO 0.1% AND LESS THAN 0.2%: Harmful. Harmful by inhalation and if swallowed. [Xn;R:20/22] The concentration stated or, in the absence of such concentrations, the general concentrations of Directive 88/379/EEC are the percentages by weight of the metallic element calculated with reference to the total weight of the preparation.

##### **Rhodium Sulfate:**

EINCES NUMBER: 234-014-5

EC CLASSIFICATION: A classification has not been given to this compound.

EC RISK PHRASES: Risk phrases have not been determined for this compound.

EC SAFETY PHRASES: Safety phrases have not been determined for this compound.

## 15. REGULATORY INFORMATION (Continued)

### Stannous Sulfate:

EINCES NUMBER: 231-302-2

EC CLASSIFICATION: A classification has not been given to this compound.

EC RISK PHRASES: Risk phrases have not been determined for this compound.

EC SAFETY PHRASES: Safety phrases have not been determined for this compound.

### Sulfuric Acid:

EINCES NUMBER: 231-639-5

EC CLASSIFICATION: Corrosive [C]

EC RISK PHRASES: Causes burns. [R:35]

EC SAFETY PHRASES: Keep locked up and out of the reach of children. *(This safety phrase may be omitted for preparations sold for industrial use only).*

In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Never add water to this product. In case of accident or if you feel unwell, seek medical advice immediately (show label where possible). Refer to special instructions/safety data sheet. [S:(1/2)\*26-30]

EC COMMENTS:

CONCENTRATION GREATER THAN OR EQUAL TO 15%: Corrosive [C] [T;R:23/25]

CONCENTRATION GREATER THAN OR EQUAL TO 0.1% AND LESS THAN 0.2%: Harmful. Harmful by inhalation and if swallowed. [Xn;R:20/22]

### AUSTRALIAN INFORMATION FOR PRODUCT:

AUSTRALIAN INVENTORY OF CHEMICAL SUBSTANCES (AICS) STATUS: The components of this products are on the AICS.

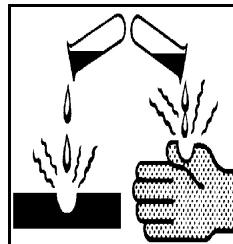
LABELING AND CLASSIFICATION: This product is classified as Corrosive, Toxic and Dangerous for the Environment [C, T, N]

CLASSIFICATION: Corrosive. Toxic. Dangerous for the Environment [C, T, N]

RISK PHRASES: Toxic by inhalation and if swallowed. Causes burns. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. [R:23/25-35-50/53]

SAFETY PHRASES: Keep locked-up and out of reach of children. *(This safety phrase may be omitted for preparations sold for industrial use only).* Keep container tightly closed. In case of contact with eyes, rinse immediately with water and seek medical advice. Do not empty into drains. Wear suitable protective clothing, gloves, and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). This material and/or its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/safety data sheet. [S:(1/2)-7-26-29-36/37/39-45 60 61]

HAZARD SYMBOL:



STANDARD FOR THE UNIFORM SCHEDULING OF DRUGS AND POISONS: Schedule 7-Dangerous Poison

ADDITIONAL LABELING INFORMATION: DANGEROUS. POISON. DO NOT TAKE INTERNALLY. KEEP OUT OF REACH OF CHILDREN. READ SAFETY DIRECTIONS. If poisoning occurs, contact a doctor or Poisons Information Centre. Phone (e.g. Australia 13 1126; New Zealand 03 4747000). Remove from contaminated area. Give oxygen and if necessary, artificial respiration. If giving mouth-to-mouth resuscitation, wash out patient's mouth and lips-do not inhale patient's expired air. Remove contaminated clothing and wash contaminated skin thoroughly. Get to a hospital or doctor quickly. May be fatal if inhaled, swallowed, or absorbed through the skin. Avoid contact with skin. Avoid breathing vapor or spray mist. The labeling requirements of the Standard for the Uniform Scheduling of Drugs and Poisons do not apply to a poison that is packaged and sold solely for industrial purposes and is labeled in accordance with the National Occupational Health and Safety Commission's *National Code of Practice for the Labeling of Workplace Substances* [NOHSC: 2012 (1994)] or its successors.

## 15. REGULATORY INFORMATION (Continued)

### DANISH INFORMATION FOR PRODUCT:

NEUROTOXIC SUBSTANCES IN THE WORKING ENVIRONMENT: No component of this product is listed as Neurotoxic Substances in The Working Environment.

### DUTCH INFORMATION FOR THE PRODUCT:

LIST OF PRIORITY SUBSTANCES: Arsenic compounds are listed as substances hazardous in the environment under VROM 93292/7-93, by the Hague, Ministry of Housing and Physical Planning and the Environment.

### GERMAN INFORMATION FOR THE PRODUCT:

AQUATIC HAZARD CLASS (WGK):

<u>Chemical</u>	<u>Class</u>
Arsenic compounds	3

TECHNICAL INSTRUCTION ON AIR QUALITY CONTROL (TALuft): None of the components of this product have specific TALuft Classifications.

### NORWEGIAN INFORMATION FOR PRODUCT:

ENVIRONMENTAL POLLUTANTS: The components of this product are not listed as Environmental Pollutants by the State Pollution Control Authority in Norway.

### SWEDISH INFORMATION FOR THE PRODUCT:

SWEDISH NATIONAL CHEMICALS INSPECTORATE'S LIST OF CARCINOGENIC SUBSTANCES: Arsenic compounds are on the National Chemicals Inspectorate's List of Carcinogenic Substances.

SWEDISH NATIONAL CHEMICALS INSPECTORATE'S ESTHER MANUAL: The components of this product are not ESTHER Substances.

OTHER SWEDISH REGULATIONS: No component of this product is on the Swedish List of Environmental Hazardous Chemicals.

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## 16. OTHER INFORMATION

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. Cohler Enterprises Inc. assumes no responsibility for injury to the vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, Cohler Enterprises, Inc. assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in his use of the material.

### FOR FURTHER INFORMATION:

For matters pertaining to the health hazards, safety precautions, environmental compliance issues associated with this product, please contact ADVANCED CHEMICAL SAFETY by calling (858)874-5577 or via email at [neal@chemical-safety.com](mailto:neal@chemical-safety.com)

### DATE OF PRINTING:

April 30, 2008

# DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:

**SECTION 2: CAS #:** This is the Chemical Abstract Service Number which uniquely identifies each constituent. It is used for computer-related searching. **ACGIH** - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits. **TLV** - Threshold Limit Value - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour Time Weighted Average (**TWA**), the 15-minute Short Term Exposure Limit, and the instantaneous Ceiling Level. Skin absorption effects must also be considered. **OSHA** - U.S. Occupational Safety and Health Administration. **PEL** - Permissible Exposure Limit - This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (*Federal Register*: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL which was vacated by Court Order. The **DFG - MAK** is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration (**OSHA**). NIOSH issues exposure guidelines called **Recommended Exposure Levels (RELs)**. **IDLH** - Immediately Dangerous to Life and Health - This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury.

**SECTION 3: HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS):** **Health Hazard:** **0** (minimal acute or chronic exposure hazard); **1** (slight acute or chronic exposure hazard); **2** (moderate acute or significant chronic exposure hazard); **3** (severe acute exposure hazard; onetime overexposure can result in permanent injury and may be fatal); **4** (extreme acute exposure hazard; onetime overexposure can be fatal). **Flammability Hazard:** **0** (minimal hazard); **1** (materials that require substantial pre-heating before burning); **2** (combustible liquid or solids; liquids with a flash point of 38-93°C [100-200°F]); **3** (Class IB and IC flammable liquids with flash points below 38°C [100°F]); **4** (Class IA flammable liquids with flash points below 23°C [73°F] and boiling points below 38°C [100°F]). **Physical Hazard:** **0** (normally stable); **1** (material that can become unstable or are otherwise slightly reactive); **2** (materials that are unstable but do not detonate or are otherwise moderately reactive); **3** (materials that can detonate when initiated or are otherwise strongly reactive); **4** (materials that can detonate at normal temperatures or pressures or are otherwise extremely reactive). A special designation is given to indicate the nature of the physical hazard (e.g., oxidizer, water reactive, pyrophoric, compressed gas, organic peroxide, unstable reactive, explosive).

**SECTION 5: NATIONAL FIRE PROTECTION ASSOCIATION (NFPA):** **Health Hazard:** **0** (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); **1** (materials that on exposure under fire conditions could cause irritation or minor residual injury); **2** (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); **3** (materials that can on short exposure could cause serious temporary or residual injury); **4** (materials that under very short exposure could cause death or major residual injury). **Flammability Hazard:** Refer to definitions for "Hazardous Materials Identification System". **Physical Hazard:** **0** (normally stable); **1** (material that can become unstable at elevated temperatures or which can react slightly with water); **2** (materials that are unstable but do not detonate or which can react violently with water); **3** (materials that can detonate when initiated or which can react explosively with water); **4** (materials that can detonate at normal temperatures or pressures).

**FLAMMABILITY LIMITS IN AIR:** Much of the information related to fire and explosion is derived from the National Fire Protection Association (**NFPA**). **Flash Point** - Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. **Autoignition Temperature:** The minimum temperature required to initiate combustion in air with no other source of ignition. **LEL** - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. **UEL** - the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

**SECTION 11: TOXICOLOGICAL INFORMATION: Human and Animal Toxicology:** Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: **LD<sub>50</sub>** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC<sub>50</sub>** - Lethal Concentration (gases) which kills 50% of the exposed animals; **ppm** concentration expressed in parts of material per million parts of air or water; **mg/m<sup>3</sup>** concentration expressed in weight of substance per volume of air; **mg/kg** quantity of material, by weight, administered to a test subject, based on their body weight in kg. Other measures of toxicity include **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom; **TD<sub>0</sub>**, **LDLo**, and **LDo**, or **TC**, **TCo**, **LCLo**, and **LCo**, the lowest dose (or concentration) to cause lethal or toxic effects. **Cancer Information:** The sources are: **IARC** - the International Agency for Research on Cancer; **NTP** - the National Toxicology Program, **RTECS** - the Registry of Toxic Effects of Chemical Substances, **OSHA** and **CAL/OSHA**. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. A **mutagen** is a chemical that causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An **embryotoxin** is a chemical that causes damage to a developing embryo (i.e., within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A **teratogen** is a chemical that causes damage to a developing fetus, but the damage does not propagate across generational lines. A **reproductive toxin** is any substance that interferes in any way with the reproductive process. **Other Information:** **BEI** - ACGIH Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV.

**SECTION 12: Ecological Information:** EC is the effect concentration in water. **BCF** = Bioconcentration Factor, which is used to determine if a substance will concentrate in lifeforms which consume contaminated plant or animal matter. **TL<sub>m</sub>** = median threshold limit; Coefficient of Oil/Water Distribution is represented by **log K<sub>ow</sub>** or **log K<sub>oc</sub>** and is used to assess a substance's behavior in the environment.

**SECTION 13: RCRA** is the Resource Conservation and Recovery Act.

**SECTION 15:** This section explains the impact of various laws and regulations on the material. **U.S.:** **EPA** is the U.S. Environmental Protection Agency. **DOT** is the U.S. Department of Transportation. **SARA** is the Superfund Amendments and Reauthorization Act. **TSCA** is the U.S. Toxic Substance Control Act. **CERCLA (or Superfund)** refers to the Comprehensive Environmental Response, Compensation, and Liability Act. Labeling is per the American National Standards Institute Standard: Hazardous Industrial Chemicals - Precautionary Labeling 2000 (**ANSI Z129.1**). **CANADA:** **CEPA** is the Canadian Environmental Protection Act. **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **TC** is Transport Canada. **DSL/NDSL** are the Canadian Domestic/Non-Domestic Substances Lists. **EUROPEAN and INTERNATIONAL:** **EC** is the European Community (formerly known as the **EEC**, European Economic Community). **EINECS:** This the European Inventory of Now-Existing Chemical Substances. The **ARD** is the European Agreement Concerning the International Carriage of Dangerous Goods by Road and the **RID** are the International Regulations Concerning the Carriage of Dangerous Goods by Rail. **AICS** is the Australian Inventory of Chemical Substances. **MITI** is the Japanese Minister of International Trade and Industry+