

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION (Continued)

- INTERNATIONAL EXPOSURE LIMITS:**

COMPONENT	Federal Republic of Germany (DFG) Maximum Concentration Values in the Workplace (MAKs)	OTHER
Rhodium Sulfate	NE	NE
Sulfuric Acid	TWA= 0.1 mg/m ³ [I, Inhalable fraction of the aerosol]	United Kingdom Workplace Exposure limits: TWA = 0.05 mg/m ³ [Thoracic fraction of the mist]

- BIOLOGICAL OCCUPATIONAL EXPOSURE LIMITS:** Not established.
- DERIVED NO EFFECT LEVEL (DNEL):** Not established.
- PREDICTED NO EFFECT CONCENTRATION (PNEC):** Not established.

8.2 EXPOSURE CONTROLS

- ENGINEERING CONTROLS:** Use this product in well-ventilated environment. Safety showers, eye wash stations, and hand-washing equipment should be available.
- RESPIRATORY PROTECTION:** None needed under normal conditions of use. Use NIOSH approved respirators if ventilation is inadequate to control mists. Maintain airborne contaminant concentrations below guidelines listed in Section 3 (Composition and Information on Ingredients). If respiratory protection is needed, use only respiratory protection authorized in the U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), equivalent U.S. State standards, Canadian CSA Standard Z94.4-93, the European Standard EN149, or EC member states. The following NIOSH Respiratory Guideline Protection Equipment recommendations for Rhodium Compounds, soluble (a component of this product):
 - 0.010 mg/m³: Any air-purifying respirator with a high-efficiency particulate filter; supplied air respirator.
 - 0.025 mg/m³: Any supplied-air respirator in continuous-flow mode; any powered, air-purifying respirator with a high-efficiency particulate filter.
 - 0.050 mg/m³: HiEF/PAPRTHiE/SCBA/SAF; Any air-purifying, full-facepiece respirator with a high-efficiency particulate filter; any powered, air-purifying respirator with a high-efficiency particulate filter and a tight face-piece; full facepiece Self Contained Breathing Apparatus; or, Supplied Air Respirator.
 - 2.0 mg/m³: SAF:PD,PP Supplied Air Respirator operated in pressure demand or positive-pressure mode.
 - Emergency or Planned Entry into Unknown Concentrations or IDLH Conditions: Positive pressure, full facepiece Self Contained Breathing Apparatus; or positive pressure, full facepiece Supplied Air Respirator with an auxiliary positive pressure Self Contained Breathing Apparatus.
 - Escape: Any air-purifying respirator with a high-efficiency particulate filter; or escape-type Self Contained Breathing Apparatus
- HAND PROTECTION:** Neoprene gloves should be used. Use triple gloves for spill response, as stated in Section 6 (Accidental Release Measures) of this SDS. If necessary, refer to U.S. OSHA 29 CFR 1910.138, appropriate Standards of Canada, or appropriate Standards of the European Economic Community.
- EYE PROTECTION:** Splash goggles or safety glasses. If more than 1 gallon of this product is to be used, a face shield should be considered. If necessary, refer to U.S. OSHA 29 CFR 1910.133, Canadian Standards, or the European Standard EN166.
- BODY PROTECTION:** Use a body protection appropriate to task (e.g., lab coat, coveralls, or apron). Care should be taken to select protection for potentially exposed areas when splashes, sprays, or prolonged exposure could occur in occupational settings.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

- (a) **APPEARANCE:** Clear, Orange-yellow liquid.
(b) **ODOR:** Acrid.
(c) **ODOR THRESHOLD:** Not determined.
(d) **pH:** Less than 1.0.
(e) **MELTING POINT/FREEZING POINT:** Not available.
(f) **INITIAL BOILING POINT AND BOILING RANGE:** Not available.
(g) **FLASH POINT:** Not applicable.
(h) **EVAPORATION RATE (water=1):** Not available.
(i) **FLAMMABILITY:** Not flammable.
(j) **UPPER/LOWER FLAMMABILITY OR EXPLOSIVE LIMITS:** Not applicable.
(k) **VAPOR PRESSURE (mmHg @ 20°C):** Not determined.
(l) **VAPOR DENSITY:** Not determined.
(m) **RELATIVE DENSITY (water=1):** 1-1.6
(n) **SOLUBILITY:** Soluble.
(o) **PARTITION COEFFICIENT: N-OCTANOL/WATER:** Not determined.
(p) **AUTO-IGNITION TEMPERATURE:** Not determined.
(q) **DECOMPOSITION TEMPERATURE:** Not determined.
(r) **VISCOSITY:** Not determined.
(s) **EXPLOSIVE PROPERTIES:** Not applicable.
(t) **OXIDIZING PROPERTIES:** Not an oxidizer.

9.2 OTHER INFORMATION

- **VOC (less water & exempt):** Not applicable.
- **WEIGHT% VOC:** Not applicable.

SECTION 10: STABILITY AND REACTIVITY

10.1 REACTIVITY

- Not reactive under typical conditions of use or handling; contact with water can generate significant amounts of heat.

10.2 CHEMICAL STABILITY

- Normally stable under standard temperatures and pressures.

10.3 POSSIBILITY OF HAZARDOUS REACTIONS

- This product is not self-reactive or air-reactive.
- This product can release heat upon contact with water.
- This product will not undergo hazardous polymerization.

10.4 CONDITIONS TO AVOID

- Avoid contact with incompatible chemicals.

10.5 INCOMPATIBLE MATERIALS

This product is not compatible with bases, halides, cyclopentadiene, cyclopentanone, oxime, nitroaryl amines, hexalithium disilicide, phosphorus(III) oxide, chlorine bromine pentafluoride, trifluoride, and oxygen difluoride (OF₂). Avoid contact with metals and water-reactive materials. This product can react with water to generate heat.

10.6 HAZARDOUS DECOMPOSITION PRODUCTS

- Products of thermal decomposition of this product can include oxides of sulfur and rhodium.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 INFORMATION ON TOXICOLOGICAL EFFECTS

- **ACUTE TOXICITY:**
 - **TOXICOLOGY DATA:** The following data are available for hazardous components in this product greater than 1% in concentration

SULFURIC ACID

Irritant (eye, rabbit) = 1.38 mg; severe effect
Irritant (eye, rabbit) = 100 mg with rinse, severe effect
TCLo (inhalation, rabbit) = 20 mg/m³
TCLo (inhalation, human) = 3 mg/m³/24 weeks
LDLo (unreported, man) = 135 mg/kg

SULFURIC ACID (continued)

LD50 (oral, rat) = 2140 mg/kg
LC50 (inhalation, rat) = 510 mg/m³/2 hr
LC50 (inhalation, mouse) = 320 mg/m³/2 hr
LC50 (inhalation, guinea pig) = 18 mg/m³

RHODIUM SULFATE

No data available.

SECTION 11: TOXICOLOGICAL INFORMATION (Continued)

- **DEGREE OF IRRITATION:** Moderate to severe especially after prolonged exposure.
- **SENSITIZATION:** Not reported to have skin or respiratory sensitization effects. Pure rhodium may have the potential to cause sensitization. Prolonged or repeated exposure to rhodium may lead to allergy-like symptoms (rashes, reddening of the skin).
- **REVIEW OF ACUTE SYMPTOMS AND EFFECTS:** See Section 2 (Hazards Information) and Section 4 (First-Aid Measures) for further details.
 - **EYES:** May cause moderate to severe eye irritation and chemical burns.
 - **SKIN:** May cause moderate to severe skin irritation, and chemical burns.
 - **INHALATION:** Mists or vapors of this product can cause nasal irritation, sore throat, choking, coughing, and breathing difficulties. Though unlikely to occur due to this product's small volume, it is important to note that inhalation of mists of this product (even for a few minutes) can cause severe lung damage with potentially life-threatening pulmonary edema (accumulation of fluid in the lungs). Symptoms of pulmonary edema include shortness of breath and chest pains; symptoms can be delayed for up to 48 hours after exposure. Prolonged or repeated over-exposures to this solution can cause burns and ulcers to the nose and throat, dental erosion, bronchitis and stomach pain.
 - **INGESTION:** Although not anticipated to be a significant route of occupational over-exposures, ingestion of this product may be fatal. Swallowing this material may cause burns in the mouth, throat, esophagus, and other tissue. Symptoms can include difficulty swallowing, intense thirst, nausea, vomiting, diarrhea, and in severe cases, collapse and death. Small amounts of acid can be aspirated during vomiting and may cause serious lung injury.

- **CHRONIC TOXICITY:**

- **CARCINOGENICITY STATUS:** The following table summarizes the carcinogenicity listing for the components of this product. "NO" indicates that the substance is not considered to be, or suspected to be, a carcinogen by the listed agency.

CHEMICAL	IARC	NTP	NIOSH	OSHA	OTHER
Rhodium Sulfate (Soluble rhodium compounds, as Rh)	NO	NO	NO	NO	MAK-3B: Substances of Concern Based on In Vitro Tests. TLV-A4: Not Classifiable as a Human Carcinogen.
Sulfuric Acid NOTE: The following information is pertinent to <i>Sulfuric in Inorganic Acid Mist</i> only!	Carc. to humans	Known to be Human Carc.	NO	NO	TLV-A2: Suspected Human Carcinogen. MAK-4: No Significant Contribution to Human Cancer Risk. California Prop. 65

- **REPRODUCTIVE TOXICITY INFORMATION:** The components of this product are not reported to cause reproductive effects under typical circumstances of exposure at the concentrations present in this product. Clinical studies on test animals exposed to relatively high doses of Sulfuric Acid (a component of this product) indicate teratogenic effects.
- **MUTAGENIC EFFECTS** The components of this product are not reported to cause mutagenic effects under typical circumstances of exposure.
- **SPECIFIC TARGET ORGAN TOXICITY – SINGLE EXPOSURE:** Not applicable.
- **SPECIFIC TARGET ORGAN TOXICITY – REPEATED EXPOSURE:** Not applicable.

- **OTHER INFORMATION**

- **TOXICOLOGICALLY SYNERGISTIC PRODUCTS:** None known.
- **ADDITIONAL TOXICOLOGY:** None known.

SECTION 12: ECOLOGICAL INFORMATION

12.1 TOXICITY

- Based on available data, this product is anticipated to be harmful or fatal to contaminated terrestrial plants or animals.
- Based on available data, this product is anticipated to be harmful or fatal to contaminated aquatic plants or animals. It has the potential to significantly lower the pH of the surrounding local water systems.
- There are following aquatic toxicity data are available for components of this product.

Sulfuric acid

LC50 *Gambusia affinis* (Mosquito fish) 42 mg/l 96 hours
Fish: Bluegill/Sunfish: 49 mg/L; 48Hr; TLm (tap water @ 20C)
Fish: Bluegill/Sunfish: 24.5 ppm; 48Hr; TLm (fresh water)

12.2 PERSISTENCE AND DEGRADABILITY

- When released into the soil, the components of this product are expected to biodegrade, dissipate in soils via oxidation, or otherwise chemically degrade or photo-decompose via solar radiation.

12.3 BIOACCUMULATIVE POTENTIAL

- The components of this product are not anticipated to bioaccumulate significantly.

12.4 MOBILITY IN SOIL

- It is to be expected this product will have small mobility in soil. Some of the components may get into the soil and, ultimately, the ground water. Product spreads on the water surface.

12.5 RESULTS OF PBT and vPvB ASSESSMENT

- No data are available.

12.6 OTHER ADVERSE EFFECTS

- ENDOCRINE DISRUPTOR INFORMATION: No component is reported to be an endocrine disruptor.

SECTION 13: DISPOSAL CONSIDERATION

13.1 WASTE TREATMENT METHODS

- **WASTE HANDLING RECOMMENDATIONS:** Prepare, transport, treat, store, and dispose of waste product according to all applicable local, U.S. State and U.S. Federal regulations, the applicable Canadian standards, or the appropriate standards of the nations of the European Community.
- **PRECIOUS METAL RECLAMATION:** Users of the product may wish to utilize precious metal reclamation services for final disposition of wastes.

13.2 DISPOSAL CONSIDERATIONS

- **EPA RCRA WASTE CODE:** D002 **EUROPEAN WASTE CODE:** 11 01 06*

SECTION 14: TRANSPORT INFORMATION

14.1,2,3,4: DANGEROUS GOODS BASIC DESCRIPTION AND OTHER TRANSPORT INFORMATION

- **DEPARTMENT OF TRANSPORTATION HAZARDOUS MATERIALS SHIPPING REGULATIONS:**

UN/NA Number	Proper Shipping Name	Packing Group	Hazard Class	Label	North American Emergency Response Guide #	Marine Pollutant Status
UN3264	Corrosive liquids, acidic, inorganic, n.o.s. (Sulfuric Acid, Rhodium Sulfate)	II	8	See Other Relevant Information	154	Not Applicable

SECTION 14: TRANSPORT INFORMATION (Continued)

○ **OTHER RELEVANT INFORMATION:**

Small Quantity Exception (49 CFR 173.4, 4a): Small quantities of Class 8 materials are not subjected to other requirements of the Hazardous Materials Regulations (Subchapter C) when the maximum quantity per inner receptacle is limited to 30 mL (liquids). Refer to 49 CFR 173.4 for specific information in packaging small quantity materials.

Limited Quantity Exceptions [49 CFR 173.154(b)(2)]: Limited quantities for Class 8, Packing Group II materials have inner packagings not over 1.0 L [0.3 gal] (liquids) net capacity each, packed in strong outer packaging.

- **CANADIAN TRANSPORTATION INFORMATION:** This product is regulated by Transport Canada as dangerous goods under Canadian transportation standards. Refer to above information.
- **IATA DESIGNATION:** This product is regulated as dangerous goods by the International Air Transport Association. Use the following information:

Proper Shipping Name	Passenger and Cargo Aircraft				Cargo Aircraft Only	
	Limited Quantity		Packing Instruction	Max. Qty per PKG	Packing Instruction	Max. Qty per PKG
	Packing Instruction	Max. Qty per PKG				
Corrosive liquid, acidic, inorganic, n.o.s. (sulfuric acid, rhodium sulfate)	Y840	0.5L	851	1L	855	30L

- **EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (ADR):** This product is to be dangerous goods. Use the above information for transport classification.

14.5: ENVIRONMENTAL HAZARDS

- None described, as related to transportation.

14.6: SPECIAL PRECAUTIONS FOR USERS

- Not applicable.

14.7: TRANSPORT IN BULK

- Not applicable.

SECTION 15: REGULATORY INFORMATION

15.1: SAFETY, HEALTH, AND ENVIRONMENTAL REGULATIONS SPECIFIC FOR THE SUBSTANCE OR MIXTURE.

● **OTHER IMPORTANT U.S. REGULATIONS**

- **U.S. SARA THRESHOLD PLANNING QUANTITY:** Sulfuric Acid = 454kg (1000 lb)
- **U.S. SARA HAZARD CATEGORIES (SECTION 311/312, 40 CFR 370-21):** ACUTE: Yes; CHRONIC: Yes; FIRE: No; REACTIVE: No; SUDDEN RELEASE: No
- **U.S. CERCLA REPORTABLE QUANTITY (RQ):** Sulfuric Acid = 454kg (1000 lb).
- **U.S. TSCA INVENTORY STATUS:** All components of this product are listed on the TSCA Inventory.
- **US SARA 313:** Sulfuric acid (aerosol forms only) is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.
- **CALIFORNIA SAFE DRINKING WATER ACT (PROPOSITION 65) STATUS:** Not applicable to the product; only "Inorganic Mist containing Sulfuric Acid" is listed as known to the State of California to cause cancer.

● **INTERNATIONAL REGULATIONS**

- **CANADIAN DSL/NDSL INVENTORY STATUS:** The listed components of this product are on the DSL/NDSL Inventory.
- **CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS:** The components of this product are not on the CEPA Priorities Substances Lists.
- **GERMAN WATER HAZARD CLASSIFICATION:** 2 (hazard to waters)

15.2: CHEMICAL SAFETY ASSESSMENT.

- No information available.

SECTION 16: OTHER INFORMATION

16.1: INDICATION OF CHANGE.

- **CHANGE INDICATED:** Amended DOT Information.
- **ORIGINAL DATE OF ISSUE:** Feb. 14, 2002
- **DATES OF UPDATES:** May 2005; Mar. 28, 2013; April 17, 2014; July 15, 2014; June 8, 2016

16.2: ABBREVIATIONS AND ACRONYMS.

ALL SECTIONS: OSHA: U.S. Federal Occupational Safety and Health Administration. WHMIS: Canadian Workplace Hazardous Materials Standard. GHS: Globally Harmonized System of Classification of Chemical Substances. REACH: European Union regulation, Registration, Evaluation, Authorization and Restriction of Chemical substances.

SECTION 2: CAS Number: Chemical Abstract Service Number, which is used by the American chemical Society to uniquely identify a chemical. EINECS: European Inventory of Existing Commercial Substances.

SECTION 3: HAZARDOUS MATERIALS IDENTIFICATION SYSTEM RATING: This is a rating system used by industry to summarize physical and health hazards to chemical users and was originally developed by the National Paint and Coating Association. 0 = No Significant Hazard. 1 = Slight Hazard. 2 = Moderate Hazard. 3 = Severe Hazard. 4 = Extreme Hazard.

SECTION 5: NFPA: National Fire Protection Association. NFPA FLAMMABILITY CLASSIFICATION: The NFPA uses the flash point (F.P.) and boiling point (BP) to classify flammable or combustible liquids. Class IA: F.P. below 73°F and BP below 100°F. Class IB: F.P. below 73°F and BP at or above 100°F. Class IC: F.P. at or above 73°F and BP at or above 100°F. Class II: F.P. at or above 100°F and below 140°F. Class IIIA: F.P. at or above 140°F and below 200°F. Class IIIB: F.P. at or above 200°F. NFPA HAZARDOUS MATERIALS RATING: This is a rating system used to summarize physical and health hazards to firefighters. 0 = No Significant Hazard. 1 = Slight Hazard. 2 = Moderate Hazard. 3 = Severe Hazard. 4 = Extreme Hazard.

SECTION 8: NE: Not established. ACGIH: American Conference of Government Industrial Hygienists; TWA: Time-Weighted Average (over an 8-hour work day); STEL: Short-Term Exposure Limit (15 minute average, no more than 4-times daily and each exposure separated by one-hour minimally); C: Ceiling Limit (concentration not to be exceeded in a work environment). PEL: Permissible Exposure Limit. NIOSH: National Institute of Occupational Safety and Health; REL: Recommended Exposure Limit; IDLH: Immediately Dangerous to Life and Health Concentrations. *Note:* In July 1992, a court ruling vacated the more protective PELs set by OSHA in 1989. Because OSHA may enforce the more protective levels under the "general duty clause", both the current and vacated levels are presented in this document. ppm: Parts per Million. mg/m³: Milligrams per cubic meter. mppcf: Millions of Particles per Cubic Foot. BEI: Biological Exposure Limit. EL: Exposure Limit (United Kingdom). Federal Republic of Germany (DFG) Maximum Concentration Values in the Workplace (MAKs)

SECTION 9: pH: Scale (0 to 14) used to rate the acidity or alkalinity of aqueous solutions. For example, a pH value of 0 indicates a strongly acidic solution, pH of 7 indicates a neutral solution, and a pH value of 14 indicates an extremely basic solution. FLASH POINT: Temperature at which a liquid generates enough flammable vapors so that ignition may occur. AUTOIGNITION TEMPERATURE: Temperature at which spontaneous ignition occurs. LOWER EXPLOSIVE LIMIT (LEL): The minimal concentration of flammable vapors in air which will sustain ignition. UPPER EXPLOSIVE LIMIT (UEL): The maximum concentration of flammable vapors in air which will sustain ignition. ≈: Approximately symbol.

SECTION 11: CARCINOGENICITY STATUS: NTP: National Toxicology Program. IARC: International Agency for Research on Cancer. REPRODUCTIVE TOXICITY INFORMATION: Mutagen: Substance capable of causing chromosomal damage to cells. Embryotoxin: Substance capable of damaging the developing embryo in an overexposed female. Teratogen: Substance capable of damaging the developing fetus in an overexposed female. Reproductive toxin: Substance capable of adversely affecting male or female reproductive organs or functions. TOXICOLOGY DATA: LD₅₀ or LC₅₀: The Lethal Dose or Lethal Concentration of a substance which will be fatal to a given percentage (xx) of exposed test animals by the designate route of administration. This value is used to access the toxicity of chemical substances to humans. TD₅₀ or TC₅₀: The Toxic Dose or Toxic Concentration of a substance which will cause an adverse effect to a given percentage (xx) of exposed test animals by the designate route of administration.

SECTION 12: TL_m – Median Tolerance Limit

SECTION 13: RCRA: Resource Conservation and Recovery Act. The regulations promulgated under this act under Act are found in 40 CFR, Sections 260 ff, and define the requirements of hazardous waste generation, transport, treatment, storage, and disposal. EPA RCRA Waste Codes: Defined in 40 CFR Section 261.

SECTION 15: CERCLA: Comprehensive Environmental Response Compensation and Liability Act (a.k.a. "Superfund") and SARA: (Superfund Amendment and Reauthorization Act). The regulations promulgated under this Act are located under 40 CFR 300 ff. and provide "community right-to-know" requirements. DSL/NDL: Canadian Domestic Substances and Non-Domestic Substances Lists.

16.3: KEY LITERATURE REFERENCES AND SOURCES FOR DATA

- SAFETY DATA SHEETS FOR COMPONENT PRODUCTS.
- Regulations (EC) No 1907/2006, 1272/2008 & 453/2010 of the European Parliament and of the Council.
- Federal OSHA Hazard Communication Standard: 29 CFR 1910.1200
- SAX – Dangerous Properties of Industrial Materials
- RTECS – Registry of Effects of Toxic Chemicals
- ESIS -European chemical Substances Information System <http://esis.jrc.ec.europa.eu/>

16.4: CLASSIFICATION AND PROCEDURE USED TO DERIVE THE CLASSIFICATIONS FOR MIXTURES

- CLASSIFICATION: Section 2 (Hazards Information) provides all relevant classification information used for this product. The assignments were based on data available for the component products, calculations, expert judgment, and weight of evidence.

16.5: WARRANTY AND COPYRIGHT

- WARRANTY: 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.