

Material Safety Data Sheet

HAZARD WARNINGS	RISK PHRASES	PROTECTIVE CLOTHING
	<p>Water-reactive. May form explosive peroxides in the presence of moisture.</p> <p>Flammable material; avoid heat and sources of ignition.</p> <p>Corrosive to eyes and skin on contact.</p> <p>CARCINOGEN. MINIMIZE EXPOSURE.</p> <p>Harmful compound, minimize exposure.</p> <p>Air sensitive material.</p> <p>Store under argon.</p>	

Section I. Chemical Product and Company Identification

Chemical Name	Trimethylsilylmethylmagnesium Chloride (ca. 18% in Tetrahydrofuran, ca. 1mol/L)		
Catalog Number	T2609	Supplier	TCI America 9211 N. Harborside St. Portland OR 1-800-423-8616
Synonym	Not available.		
Chemical Formula	C ₄ H ₁₁ ClMgSi		
CAS Number	13170-43-9 109-99-9 (Tetrahydrofuran)	In case of Emergency Call	Chemtrec® (800) 424-9300 (U.S.) (703) 527-3887 (International)

Section II. Composition and Information on Ingredients

Chemical Name	CAS Number	Percent (%)	TLV/PEL	Toxicology Data
Trimethylsilylmethylmagnesium Chloride (ca. 18% in Tetrahydrofuran, ca. 1mol/L)	13170-43-9 109-99-9 (Tetrahydrofuran)	Ca. 18% Ca. 82% Tetrahydrofuran	This chemical is classified as a carcinogen. There is no acceptable exposure limit for a carcinogen.	(Tetrahydrofuran) Rat LD ₅₀ (oral) 1650 mg/kg Mouse LD ₅₀ (intraperitoneal) 1900 mg/kg Rat LD ₅₀ (intraperitoneal) 2900 mg/kg

Section III. Hazards Identification

Acute Health Effects	<p>Corrosive to skin, eyes, and respiratory system. Liquid or spray mist may produce tissue damage, particularly in mucous membranes of the eyes, mouth and respiratory tract. Skin contact may produce burns. Eye contact can result in corneal damage or blindness. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Corrosive materials may cause serious injury if ingested.</p> <p>Harmful if ingested or inhaled. Minimize exposure to this material. Severe overexposure can result in injury or death. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.</p>
Chronic Health Effects	<p>CARCINOGENIC EFFECTS : Carcinogenic by RTECS criteria</p> <p>MUTAGENIC EFFECTS : Not available.</p> <p>TERATOGENIC EFFECTS : Tumorigenic Effects (Tetrahydrofuran) Mouse TClO (Inhalation) 113400 mg/kg/105 weeks intermittent Toxic Effects: Tumorigenic - Carcinogenic by RTECS criteria Liver - Tumors Mouse TClO (Inhalation) 1800 ppm/6 hours/2 years intermittent Toxic Effects: Tumorigenic - Carcinogenic by RTECS criteria Liver - Tumors</p> <p>DEVELOPMENTAL TOXICITY: Reproductive Effects (Tetrahydrofuran) Rat TClO (Inhalation) 5000 ppm/6 hours; female 6-19 days of pregnancy Toxic Effects: Effects on Embryo or Fetus - Fetotoxicity Rat TDLo (Oral) 1.125 mg/kg; female multigeneration Toxic Effects: Effects on Newborn - Behavioral Effects on Newborn - Physical Effects on Newborn - Delayed effects Mouse TDLo (Oral) 2592 mg/kg; female 6-17 days of pregnancy Effects on Fertility - Litter size Effects on Embryo or Fetus - Fetotoxicity Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection.</p>

Section IV. First Aid Measures

Eye Contact	Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.
Skin Contact	In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.
Inhalation	If the victim is not breathing, perform mouth-to-mouth resuscitation. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, oxygen can be administered. Seek medical attention if respiration problems do not improve.
Ingestion	DO NOT INDUCE VOMITING. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive.

Section V. Fire and Explosion Data

Flammability	Flammable.	Auto-Ignition	321 °C (609.8 °F) (Tetrahydrofuran)
Flash Points	-40 °C (-40 °F). -17 °C (1.4 °F). (Tetrahydrofuran)	Flammable Limits	LOWER: 1.8% UPPER: 11.8% (Tetrahydrofuran)
Combustion Products	These products are toxic carbon oxides (CO, CO ₂), halogenated compounds. Some metallic oxides, silicates. WARNING: Highly toxic HCl gas is produced during combustion.		
Fire Hazards	Not available.		
Explosion Hazards	Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.		
Fire Fighting Media and Instructions	Flammable liquid. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog. Consult with local fire authorities before attempting large scale fire-fighting operations.		

Section VI. Accidental Release Measures

Spill Cleanup Instructions	Water-reactive material. May form explosive peroxides. Flammable material. Corrosive material. Carcinogenic material. Harmful material. Air sensitive material. Keep away from heat. Mechanical exhaust required. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. DO NOT get water inside container. DO NOT touch spilled material. Use water spray curtain to divert vapor drift. Prevent entry into sewers, basements or confined areas; dike if needed. Consult federal, state, and/or local authorities for assistance on disposal.
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Section VII. Handling and Storage

Handling and Storage Information	WATER REACTIVE. MAY FORM EXPLOSIVE PEROXIDES. FLAMMABLE. CORROSIVE. CARCINOGEN. HARMFUL. AIR SENSITIVE. STORE UNDER ARGON. Keep under inert atmosphere. Keep container dry. Do not breathe gas/fumes/vapor/spray. Never add water to this product. Wear suitable protective clothing. If you feel unwell, seek medical attention and show the label when possible. Treat symptomatically and supportively. Always store away from incompatible compounds such as oxidizing agents, acids.
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Section VIII. Exposure Controls/Personal Protection

Engineering Controls	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash station and safety shower is proximal to the work-station location.
Personal Protection	Face shield. Lab coat. Vapor respirator. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product. Be sure to use a MSHA/NIOSH approved respirator or equivalent.
Exposure Limits	This chemical is classified as a carcinogen. There is no acceptable exposure limit for a carcinogen.

**Section IX. Physical and Chemical Properties**

Physical state @ 20°C	Liquid. (Clear. Dark brown.)	Solubility	Not available.
Specific Gravity	0.889 (water=1) (Tetrahydrofuran)		
Molecular Weight	146.97 72.11 (Tetrahydrofuran)	Partition Coefficient	LOG P _{ow} : 0.46 @ 20°C (Tetrahydrofuran)
Boiling Point	65 to 67°C (149 to 152.6°F) @ 760 mmHg (Tetrahydrofuran)	Vapor Pressure	143 mmHg (@ 20°C)
Melting Point	-108°C (-162.4 °F) (Tetrahydrofuran)	Vapor Density	2.5 g/L (Air = 1)
Refractive Index	1.407 (Tetrahydrofuran)	Volatility	Not available.
Critical Temperature	Not available.	Odor	Not available.
Viscosity	Not available.	Taste	Not available.

Section X. Stability and Reactivity Data

Stability	This material is stable if stored under proper conditions. (See Section VII for instructions)
Conditions of Instability	Avoid excessive heat and light.
Incompatibilities	Reactive with oxidizing agents, strong acids. The product REACTS violently with water to emit EXPLOSIVE PEROXIDES. (Tetrahydrofuran) Reactive with oxygen.

Section XI. Toxicological Information

RTECS Number	LU5950000
Routes of Exposure	Eye Contact. Ingestion. Inhalation. Skin contact.
Toxicity Data	(Tetrahydrofuran) Rat LD ₅₀ (oral) 1650 mg/kg Mouse LD ₅₀ (intraperitoneal) 1900 mg/kg Rat LD ₅₀ (intraperitoneal) 2900 mg/kg
Chronic Toxic Effects	CARCINOGENIC EFFECTS : Carcinogenic by RTECS criteria MUTAGENIC EFFECTS : Not available. TERATOGENIC EFFECTS : Tumorigenic Effects (Tetrahydrofuran) Mouse TCLo (Inhalation) 113400 mg/kg/105 weeks intermittent Toxic Effects: Tumorigenic - Carcinogenic by RTECS criteria Liver - Tumors Mouse TCLo (Inhalation) 1800 ppm/6 hours/2 years intermittent Toxic Effects: Tumorigenic - Carcinogenic by RTECS criteria Liver - Tumors DEVELOPMENTAL TOXICITY: Reproductive Effects (Tetrahydrofuran) Rat TCLo (Inhalation) 5000 ppm/6 hours; female 6-19 days of pregnancy Toxic Effects: Effects on Embryo or Fetus - Fetotoxicity Rat TDLo (Oral) 1.125 mg/kg; female multigeneration Toxic Effects: Effects on Newborn - Behavioral Effects on Newborn - Physical Effects on Newborn - Delayed effects Mouse TDLo (Oral) 2592 mg/kg; female 6-17 days of pregnancy Effects on Fertility - Litter size Effects on Embryo or Fetus - Fetotoxicity Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection.
Acute Toxic Effects	Corrosive to skin, eyes, and respiratory system. Liquid or spray mist may produce tissue damage, particularly in mucous membranes of the eyes, mouth and respiratory tract. Skin contact may produce burns. Eye contact can result in corneal damage or blindness. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Corrosive materials may cause serious injury if ingested. Harmful if ingested or inhaled. Minimize exposure to this material. Severe overexposure can result in injury or death. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.

Section XII. Ecological Information

Ecotoxicity	Not available.
Environmental Fate	Not available.

Section XIII. Disposal Considerations

Waste Disposal	Recycle to process, if possible. Consult your local regional authorities. You may be able to dissolve or mix material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber system. Observe all federal, state and local regulations when disposing of the substance.
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Section XIV. Transport Information

DOT Classification	DOT CLASS 4.3: Dangerous when wet. DOT CLASS 3: Flammable liquid
PIN Number	UN3399
Proper Shipping Name	Organometallic substance, liquid, water-reactive, flammable
Packing Group (PG)	I
DOT Pictograms	

Section XV. Other Regulatory Information and Pictograms

TSCA Chemical Inventory (EPA)	This product is NOT on the EPA Toxic Substances Control Act (TSCA) inventory. The following notices are required by 40 CFR 720.36 (C) for those products not on the inventory list: (i) These products are supplied solely for use in research and development by or under the supervision of a technically qualified individual as defined in 40 CFR 720.0 et sec. (ii) The health risks of these products have not been fully determined. Any information that is or becomes available will be supplied on an MSDS sheet.
WHMIS Classification (Canada)	CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS E: Corrosive liquid.
EINECS Number (EEC)	203-726-8 (Tetrahydrofuran)
EEC Risk Statements	R14- Reacts violently with water. R10- Flammable. R18- In use, may form flammable/explosive vapor-air mixture. R34- Causes burns. R45- May cause cancer. R20/21/22- Harmful by inhalation, in contact with skin and if swallowed.
Japanese Regulatory Data	(Tetrahydrofuran) ENCS no.: 5-53; 5-3335

Section XVI. Other Information

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Notice to Reader

TCI laboratory chemicals are for research purposes only and are NOT intended for use as drugs, food additives, households, or pesticides. The information herein is believed to be correct, but does not claim to be all inclusive and should be used only as a guide. Neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All chemical reagents must be handled with the recognition that their chemical, physiological, toxicological, and hazardous properties have not been fully investigated or determined. All chemical reagents should be handled only by individuals who are familiar with their potential hazards and who have been fully trained in proper safety, laboratory, and chemical handling procedures. Although certain hazards are described herein, we can not guarantee that these are the only hazards which exist. Our MSDS sheets are based only on data available at the time of shipping and are subject to change without notice as new information is obtained. Avoid long storage periods since the product is subject to degradation with age and may become more dangerous or hazardous. It is the responsibility of the user to request updated MSDS sheets for products that are stored for extended periods. Disposal of unused product must be undertaken by qualified personnel who are knowledgeable in all applicable regulations and follow all pertinent safety precautions including the use of appropriate protective equipment (e.g. protective goggles, protective clothing, breathing equipment, facial mask, fume hood). For proper handling and disposal, always comply with federal, state, and local regulations.