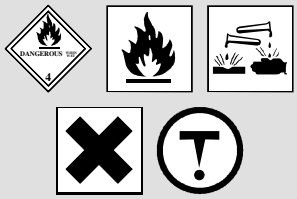
TCI AMERICA

Material Safety Data Sheet

HAZARD WARNINGS	RISK PHRASES	PROTECTIVE CLOTHING
	**Water-reactive. May ignite or generate flammable gas in the presence of moisture.** **Flammable material; avoid heat and sources of ignition.** **Corrosive to eyes and skin on contact.** **Harmful compound, minimize exposure.** **CARCINOGEN. MINIMIZE EXPOSURE.**	

Section I. Chemical Product and Company Identification

Chemical Name: **Methylmagnesium Bromide**
(12% in Tetrahydrofuran, ca. 1 mol/L)

Catalog Number	M0362
Synonym	Not available.
Chemical Formula	CH_3MgBr
CAS Number	75-16-1 (Methylmagnesium Bromide) 109-99-9 (Tetrahydrofuran)

Supplier: TCI America
9211 N. Harborgate St.
Portland OR
1-800-423-8616

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
Methylmagnesium Bromide (12% in Tetrahydrofuran, ca. 1 mol/L)	75-16-1 Methylmagnesium Bromide) 109-99-9 (Tetrahydrofuran)	ca. 12.0% ca. 88.0%	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 Rat LC_{50} (inhalation) 21000 ppm

Section III. Hazards Identification

Acute Health 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.

Chronic Health Effects

CARCINOGENIC EFFECTS : Not available.
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
Rat TCLo Inhalation 1800 ppm/6 hours/2 years intermittent
TOXIC Effects:
Tumorigenic - Equivocal tumorigenic agent by RTECS criteria
Kidney, Ureter, and Bladder - 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
TOXIC Effects:
Effects on Fertility - Litter size
Effects on Embryo or Fetus - Fetotoxicity

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Emergency phone number (800) 424-9300

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	-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). Some metallic oxides. Halogenated compounds.		
Fire Hazards	Extremely flammable in presence of open flames and sparks, of shocks, of heat.		
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. Flammable material. Corrosive material. Harmful material. Carcinogenic 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 touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Consult federal, state, and/or local authorities for assistance on disposal.

Section VII. Handling and Storage

Handling and Storage Information	WATER-REACTIVE. FLAMMABLE. CORROSIVE. HARMFUL. CARCINOGEN. Keep under inert atmosphere. Keep container dry. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. Always store away from incompatible compounds such as oxidizing agents.

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. (pale greyish brown, slightly suspense.)	Solubility	Not available.
Specific Gravity	0.889 (water=1) (Tetrahydrofuran)		
Molecular Weight	CH_3MgBr=119.24 (Methylmagnesium Bromide) C_4H_8O=72.11 (Tetrahydrofuran)	Partition Coefficient	Log K_{ow}: 0.46 @ 20°C (Tetrahydrofuran)
Boiling Point	65 to 67°C (149 to 152.6°F) (Tetrahydrofuran)	Vapor Pressure	143 mmHg (@ 20°C) (Tetrahydrofuran)
Melting Point	-108°C (-162.4°F) (Tetrahydrofuran)	Vapor Density	Not available.
Refractive Index	1.407 (Tetrahydrofuran)	Volatility	Not available.
Critical Temperature	Not available.	Odor	Characteristic.
Viscosity	Not available.	Taste	Not available.

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Section X. Stability and Reactivity Data

Stability	This material is stable if stored under proper conditions. (See Section VII for instructions)
Conditions of Instability	Air and light sensitive. Forms explosive mixtures in air. Reacts violently with water especially when water is added to the product.
Incompatibilities	Reactive with oxidizing agents. The product REACTS violently with water to emit FLAMMABLE BUT NON TOXIC GASES.

Section XI. Toxicological Information

RTECS Number	LU5950000 (Tetrahydrofuran)
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 Rat LC_{50} (inhalation) 21000 ppm
Chronic Toxic Effects	**CARCINOGENIC EFFECTS** : Not available. **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 Rat TCLo Inhalation 1800 ppm/6 hours/2 years intermittent TOXIC Effects: Tumorigenic - Equivocal tumorigenic agent by RTECS criteria Kidney, Ureter, and Bladder - 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 TOXIC Effects: Effects on Fertility - Litter size Effects on Embryo or Fetus - Fetotoxicity
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	(Tetrahydrofuran) Tetrahydrofuran's production and use as a solvent for natural and synthetic resins and in organic synthesis may result in its release to the environment through various waste streams. If released to air, a vapor pressure of 162 mm Hg at 25 deg C indicates tetrahydrofuran will exist solely as a vapor in the ambient atmosphere. Vapor-phase tetrahydrofuran will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl and nitrate radicals; the half-life for these reactions in air are about 1 and 3 days, respectively. If released to soil, tetrahydrofuran is expected to have very high mobility based upon Koc values of 23 and 18. Volatilization from moist soil surfaces is expected to be an important fate process based upon a Henry's Law constant of 7.1X10-5 atm-cu m/mole. Tetrahydrofuran may volatilize from dry soil surfaces based upon its vapor pressure. Tetrahydrofuran added to surface soil had an abiotic half-life of 5.7 days. If released into water, tetrahydrofuran is not expected to adsorb to suspended solids and sediment based upon the Koc. Tetrahydrofuran is expected to biodegrade under aerobic conditions but may be resistant to biodegradation in anaerobic environments. In the modified MITI screening test, tetrahydrofuran at 30 mg/l was completely biodegraded in 14 days using an activated sludge inoculum. Tetrahydrofuran at 50 mg C/l was resistant to anaerobic biodegradation with a lag period of greater than 60 days using a primary digesting sludge as an inoculum. Volatilization from water surfaces is expected to be an important fate process based upon this compound's Henry's Law constant. Estimated volatilization half-lives for a model river and model lake are 13.1 hrs and 6.6 days, respectively. An estimated BCF of 3 suggests the potential for bioconcentration in aquatic organisms is low. Hydrolysis is not expected to occur due to the lack of hydrolyzable functional groups. Occupational exposure to tetrahydrofuran may occur through inhalation and dermal contact with this compound at workplaces where tetrahydrofuran is produced or used.

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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.

Section XIV. Transport Information

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

Section XV. Other Regulatory Information and Pictograms

TSCA Chemical Inventory (EPA)	This compound is **ON** the EPA Toxic Substances Control Act (TSCA) inventory list.
WHMIS Classification (Canada)	CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2B: Material causing other toxic effects (TOXIC). CLASS E: Corrosive liquid. On DSL (Tetrahydrofuran)
EINECS Number (EEC)	200-844-1
EEC Risk Statements	R10- Flammable. R18- In use, may form flammable/explosive vapor-air mixture. R20/21/22- Harmful by inhalation, in contact with skin and if swallowed. R36/37/38- Irritating to eyes, respiratory system and skin. R45- May cause cancer. R34- Causes burns.
Japanese Regulatory Data	ENCS No. 2-3468 (Methylmagnesium Bromide) ENCS No. 5-53 ; 5-3335 (Tetrahydrofuran)

Section XVI. Other Information

Version 1.0
Validated on 6/25/2007.
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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.