FMC Lithium

Material Safety Data Sheet

MSDS Ref. No: QS-MSD-245
Version: US/Canada
Date Approved: 03/15/2009
Revision No: 1

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Isopropylmagnesium chloride in tetrahydrofuran
CHEMICAL FAMILY: Grignard reagent
MOLECULAR FORMULA: C_3H_7 Mg Cl
GENERAL USE: For Industrial Use

MANUFACTURER
FMC CORPORATION
Lithium Division
P.O. Box 795
Bessemer City, NC 28016-0795
General Information: (704) 868-5300

Emergency Telephone Numbers:
CHEMTREC (800) 424-9300
Emergency Phone (704) 629-5361 (Plant) Call Collect 24 Hr/Day
Emergency Phone (303) 595-9048 (Medical) Call Collect

2. HAZARDS IDENTIFICATION

Section 2

CLASSIFICATION:
Substances and mixtures, which on contact with water, emit flammable gases; Category 1
Flammable liquid; Category 2
Corrosive to skin; Category 1
Specific target organ systemic toxicity – Single exposure; Category 3

LABELING:

SYMBOLS: Flame, corrosion, exclamation mark
SIGNAL WORD: Danger
HAZARD STATEMENTS: In contact with water releases flammable gases, which may ignite spontaneously
Highly flammable liquid and vapour
Causes severe skin burns and eye damage
May cause drowsiness or dizziness

PRECAUTIONARY STATEMENTS:

Prevention:
Keep from any possible contact with water, because of violent reaction and possible flash fire.
Handle under inert gas, protect from moisture.
Wear chemical splash goggles with a face shield, rubber gloves and rubber clothing.
Keep away from heat/sparks/open flame -- No smoking.
Keep container tightly closed.
Ground/Bond container and receiving equipment.
Use explosion-proof electrical, ventilation and lighting equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Do not breathe dust or mist.
Wash thoroughly after handling.
Avoid breathing vapours.
Use only outdoors or in a well-ventilated area.

Response
In case of fire, use dry chemical for extinction. DO NOT USE WATER OR CARBON DIOXIDE.

First Aid

See Section 4 of the MSDS.
Storage
See Section 7 of the MSDS.
Disposal
See Section 13 of the MSDS.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS #	EC No	Wt.%	Classification, Hazard Statement Codes	
isopropylmagnesium chloride	1068-55-9	213-947-1	15-25	Water-react. Cat. 1 Skin Corr. Cat 1A	H260 H314
tetrahydrofuran	109-99-9	203-726-8	75-85	Flam. liq. Cat. 2 Eye Irrit. Cat. 2 STOT SE Cat. 3	H225 H319 H335

4. FIRST AID MEASURES

EYES: Immediately flush with water for at least 15 minutes, lifting the upper and lower eyelids intermittently. See a medical doctor or ophthalmologist immediately.

SKIN: Quickly wipe off as much as possible, then immediately flush with plenty of water while removing contaminated clothing and/or shoes. Thoroughly wash with soap and water. Obtain immediate medical attention. Contact a medical doctor if necessary.

INGESTION: Quickly wipe material from the mouth and rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. See a medical doctor immediately.

INHALATION: Remove to fresh air. If breathing discomfort occurs and persists, see a medical doctor. If breathing has stopped, give artificial respiration and see a medical doctor immediately.

NOTES TO MEDICAL DOCTOR:
This product is corrosive to eyes, skin, and mucous membranes. Consideration should be given to careful endoscopy as stomach or esophageal burns, perforations or strictures may occur. Careful gastric lavage with an endotracheal tube in place should be considered. Observation may be warranted. Treatment is controlled removal of exposure followed by symptomatic and supportive care.

5. FIRE FIGHTING MEASURES

FLAMMABLE LIMITS: Upper: 11.8% (THF) Lower: 2% (THF)

GENERAL HAZARD: Flammable liquid. Reacts violently with water to give off flammable fumes and corrosive dust.

EXTINGUISHING MEDIA: DO NOT USE WATER OR CARBON DIOXIDE. Use dry chemical.

HAZARDOUS COMBUSTION PRODUCTS: Magnesium hydroxide, carbon dioxide, carbon monoxide.

FIRE FIGHTING PROCEDURES: Wear full protective clothing and self-contained breathing apparatus (SCBA) approved for fire fighting. This is necessary to protect against the hazards of heat, products of combustion and oxygen deficiency. Do not breathe smoke, gases or vapors generated.

AUTOIGNITION TEMPERATURE: Not applicable

PROPERTIES CONTRIBUTING TO FLAMMABILITY: Water reactivity and volatility of solvents.

FLASH POINT: -18ºC

SENSITIVITY TO STATIC DISCHARGE: Yes
SENSITIVITY TO IMPACT: None

COMMENTS:
(See Section 10, Stability and Reactivity)

6. ACCIDENTAL RELEASE MEASURES

RELEASE NOTES: Remove all sources of ignition. Do not use water in the initial phases of clean up. Contain spill with absorbent. Transfer to approved transport container and clean up spillage with an absorbent. Dispose of waste according to local and Federal laws and regulations. Before cleanup measures begin, review the entire MSDS with particular attention to Section 3, Emergency Overview and Potential Health Effects; and Section 8, Recommended Personal Protective Equipment.

7. HANDLING AND STORAGE

HANDLING: Use in a closed system under argon or nitrogen. Do not get in eyes, on skin or clothing. Do not breathe vapors or mist.

STORAGE: Store in a cool place. Storage temperature should be kept below 30 ºC. Keep container closed. Keep away from sources of ignition, water, air, acids and oxidizing agents.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS

Chemical Name	TWA (ACGIH)	STEL/Ceiling (ACGIH)	PEL (OSHA)	STEL/Ceiling (OSHA)
tetrahydrofuran	200 ppm	250 ppm	200 ppm	

ENGINEERING CONTROLS:

Use in closed system under argon or nitrogen. If personal contact can occur, use local exhaust ventilation (explosion-proof), to keep airborne concentrations below exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

Eyes And Face: Chemical splash goggles with a face shield.

Respiratory: When engineering controls are not adequate, wear a NIOSH/MSHA respirator approved for protection against organic vapors and mists.

Protective Clothing: Rubber gloves and rubber clothing.

Work Hygienic Practices: Quick-drench eyewash and safety shower.

9. PHYSICAL AND CHEMICAL PROPERTIES

ODOR: That of tetrahydrofuran
APPEARANCE: Brown-gray liquid
pH: Not applicable
PERCENT VOLATILE: 75-85%
VAPOR PRESSURE: 162.1 mm Hg at 20 C° (THF)
VAPOR DENSITY: (Air = 1):

BOILING POINT:	66 C° (THF)
MELTING POINT:	Not applicable.
SOLUBILITY IN WATER:	Product reacts with water.
EVAPORATION RATE(Butyl Acetate = 1):	8 (THF)
SPECIFIC GRAVITY:	0.975 g/cc
MOLECULAR WEIGHT:	102.85
COEFF. OIL/WATER:	Not applicable
ODOR THRESHOLD:	Not available
FLAMMABLE LIMITS:	Upper: 11.8% (THF) Lower: 2% (THF)
FLASH POINT:	-18ºC
AUTOIGNITION TEMPERATURE:	Not available.
VISCOSITY:	Not available
FLAMMABILITY:	Water reactive material in flammable liquid solvent
DECOMPOSITION TEMPERATURE:	Not available
EXPLOSIVE PROPERTIES:	Not applicable.
OXIDIZING PROPERTIES:	Not applicable.

10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID:	Water, heat, sparks, open flame, and air.
STABILITY:	Stable at room temperature.
POLYMERIZATION:	Does not polymerize
HAZARDOUS DECOMPOSITION PRODUCTS:	none
INCOMPATIBLE MATERIALS:	Acids, alcohols, oxidizers, oxygen, heat, sparks, water and open flame.

11. TOXICOLOGICAL INFORMATION

Eye Contact: No data available for the product.
isopropylmagnesium chloride: Corrosive

Skin Contact: No data available for the product.
isopropylmagnesium chloride: Corrosive

Skin Absorption: No data available for the product.

Ingestion: No data available for the product.
THF: LD_{50} = 1650 mg/kg (rat) [RTECS]

Inhalation: No data available for the product.
THF: LC_{50} = 21,000 ppm , 3 hr., (rat) [RTECS]

Acute Effects From Overexposure:
No data available for the product. This product is corrosive to skin, eyes (may cause blindness), mucous membranes and upper respiratory tract.

Tetrahydrofuran: Inhalation of vapors may cause dizziness, nausea, anesthesia, numbness, motor weakness in fingers and toes, incoordination, and headache.

Chronic Effects From Overexposure:
No data available for the product.

Tetrahydrofuran: Repeated or prolonged exposure may cause signs of central nervous system depression and respiratory irritation. This material has been shown to induce tumors in laboratory animals. Tetrahydrofuran did not produced genetic damage in bacterial or mammalian cell cultures or in animals. Testing for reproductive effects showed no change in reproductive performance.

Sensitization:	No data available for the product.
Carcinogenicity:	EH40: Not listed. IARC: Not listed. NTP: Tetrahydrofuran is listed as a substance that is reasonably anticipated to be a carcinogen. OSHA: Not considered a carcinogen under OSHA. OTHER: ACGIH: Tetrahydrofuran is listed as Category A3, a confirmed animal carcinogen with unknown relevance to humans.
Mutagenicity:	No data available for the product. THF: THF gave negative results in bacterial mutagenicity tests with and without metabolic activation..
Reproductive Toxicity:	No data available for the product. THF: One animal study suggests that THF does not cause reproductive effects at doses which are not maternally toxic.

12. ECOLOGICAL INFORMATION

Ecotoxicological Information:
Environmental toxicity testing of the product has not been carried out.
THF: 48 hr. LC_{50} = 2820; 2930 mg/l (orfe) [Handbook Env. Data on Org. Chem., 4th Ed]
96 hr. LC_{50} = 2160 mg/L (fathead minnow) [Handbook Env. Data on Org. Chem., 4th Ed]

Chemical Fate Information:
No data available for the product. isopropylmagnesium chloride reacts violently with water to form propane and magnesium hydroxide.

Tetrahydrofuran: THF is expected to volatilize from both water and soil and leach into groundwater. It will not photodegrade or adsorb to sediment. Limited evidence suggests it may biodegrade. Based on a relatively low Kow (0.47), it is not expected to bioconcentrate.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD:	Dispose of waste according to local and Federal laws and regulations.

14. TRANSPORT INFORMATION

UN NUMBER:	UN3399
PROPER SHIPPING NAME:	Organometallic substance, liquid, water-reactive, flammable (isopropylmagnesium chloride, tetrahydrofuran, solution)
CLASSIFICATION:	Dangerous when wet, 4.3 (3, Flammable liquid)
LABELS:	Dangerous when wet, Flammable

PACKING GROUP:	I
FLASH POINT:	-18ºC
CUSTOM TARIFF NO:	2931.00.9160
MARINE POLLUTANT:	No
PIH:	Not designated Poison Inhalation Hazard by US DOT.

15. REGULATORY INFORMATION

UNITED STATES

SECTION 311 HAZARD CATEGORY (40 CFR 370):	Fire hazard, immediate (acute) health hazard, reactive
SECTION 313 REPORTABLE INGREDIENTS (40 CFR 372):	This product does not contain a toxic chemical subject to the reporting requirements of Section 313 of Emergency Planning and Community Right-To-Know Act of 1986.
SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355):	Not listed
CERCLA HAZARDOUS SUBSTANCE (40 CFR 302.4):	Tetrahydrofuran is listed. The reportable quantity is 1000 pounds.
TSCA SEC 12B EXPORT NOTIFICATION:	This product is subject to TSCA 12(b) export notification requirements due to the presence of tetrahydrofuran.
TSCA INVENTORY STATUS (40 CFR 710):	Listed

CANADA

WHMIS:	Product Identification No.: 3399 Hazard Classification: Class B, Division 2 (Flammable liquid) Class B, Division 6 (Reactive Flammable Materials) Class E, (Corrosive) Ingredient Disclosure List: Diethyl ether is listed.

16. OTHER INFORMATION

REVISION SUMMARY: Revision #1: Sections 2, 3, 9, 14 & 16 revised. Regular review completed.

NFPA RATING

HEALTH: 3
FLAMMABILITY: 4
REACTIVITY: 2
SPECIAL: ~~W~~

This MSDS has been prepared to meet U. S. OSHA Hazard Communication Standard, 29 CFR 1910.1200 and Canada's Workplace Hazardous Materials Information System (WHMIS) requirements.
type 2d