

Material Safety Data Sheet

Methylmagnesium bromide, 1M solution in THF

ACC# 09568

Section 1 - Chemical Product and Company Identification

MSDS Name: Methylmagnesium bromide, 1M solution in THF

Catalog Numbers: AC377380000, AC377381000, AC377388000

Synonyms:

Company Identification:

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

| CAS# | Chemical Name | Percent | EINECS/ELINCS |
|----------|--------------------------|---------|---------------|
| 109-99-9 | Tetrahydrofuran | 85-88 | 203-726-8 |
| 75-16-1 | Methyl magnesium bromide | 12-15 | 200-844-1 |

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: gray to brown black liquid. Flash Point: -17 deg C.

Danger! Reacts violently with water liberating highly flammable gases. Extremely flammable liquid and vapor. Vapor may cause flash fire. Causes burns by all exposure routes. Water-reactive. May be absorbed through intact skin. May be harmful if swallowed. May cause central nervous system depression. May cause lung damage. May form explosive peroxides. Light sensitive. Air sensitive. May cause liver and kidney damage.

Target Organs: Kidneys, central nervous system, liver, lungs, respiratory system, gastrointestinal system, eyes, skin.

Potential Health Effects

Eye: Causes eye burns. Damage may be permanent.

Skin: Causes skin burns. May be absorbed through the skin. If absorbed, causes symptoms similar to those of inhalation. THF is not a skin sensitizer in animals.

Ingestion: Causes gastrointestinal tract burns. May cause central nervous system depression. May be harmful if swallowed.

Inhalation: Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. Causes chemical burns to the respiratory tract. Vapors may cause dizziness or suffocation. Inhalation may cause coughing, difficulty breathing and loss of consciousness. Inhalation of tetrahydrofuran vapors may cause abnormal liver function as detected by laboratory tests. (Dupont)

Chronic: Prolonged or repeated eye contact may cause conjunctivitis. Prolonged or repeated skin contact may cause defatting and dermatitis. May cause liver and kidney damage. May cause lung damage. Narcotic in high concentrations. Tetrahydrofuran studies show carcinogenic activity in the liver and kidneys of laboratory animals. The kidney tumors were by a mechanism that has no relevance in humans. (Dupont)

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid immediately. If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively. Persons with skin problems or liver, kidney, lung, or blood diseases may be at increased risk from exposure to this substance.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Will burn if involved in a fire. Water Reactive. Material will react with water and may release a flammable and/or toxic gas. May form explosive peroxides. May re-ignite after fire is extinguished. Extremely flammable liquid and vapor. Vapor may cause flash fire. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas.

Extinguishing Media: Do NOT use carbon dioxide. Use dry chemical to fight fire. DO NOT USE WATER! Contact professional fire-fighters immediately.

Flash Point: -17 deg C (1.40 deg F)

Autoignition Temperature: Not available.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 3; Instability: 2; Special Hazard: -W-

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Remove all sources of ignition. Use a spark-proof tool. Isolate area and deny entry. Provide ventilation. Do not expose spill to water.

Section 7 - Handling and Storage

Handling: Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Do not breathe dust, vapor, mist, or gas. Do not get in eyes, on skin, or on clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Take precautionary measures against static discharges. Keep container tightly closed. Handle under an inert atmosphere. Do not allow contact with water. Use only in a chemical fume hood. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Keep away from heat, sparks and flame.

Storage: Keep away from sources of ignition. Store in a cool, dry place. Do not store in direct sunlight. Store in a tightly closed container. Keep from contact with oxidizing materials. Flammables-area. Corrosives area. Water free area. Store under nitrogen. Containers should be dated when opened and tested periodically for the presence of peroxides. Should crystals form in a peroxidizable liquid, peroxidation may have occurred and the product should be considered extremely dangerous. In this instance, the container should only be opened remotely by professionals. All peroxidizable substances should be stored away from heat and light and be protected from ignition sources.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local explosion-proof ventilation to keep airborne levels to acceptable levels.

Exposure Limits

| Chemical Name | ACGIH | NIOSH | OSHA - Final PELs |
|--------------------------|--|---|----------------------------|
| Tetrahydrofuran | 50 ppm TWA; 100 ppm STEL; Skin - potential significant contribution to overall exposure by the cutaneous route | 200 ppm TWA; 590 mg/m3 TWA 2000 ppm IDLH | 200 ppm TWA; 590 mg/m3 TWA |
| Methyl magnesium bromide | none listed | none listed | none listed |

OSHA Vacated PELs: Tetrahydrofuran: 200 ppm TWA; 590 mg/m3 TWA Methyl magnesium bromide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: gray to brown black

Odor: pungent odor

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate:Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point:Not available.

Decomposition Temperature:Not available.

Solubility: vigorous reaction

Specific Gravity/Density:1.000

Molecular Formula:CH₃BrMg

Molecular Weight:119.24

Section 10 - Stability and Reactivity

Chemical Stability: Stable. However, may decompose if exposed to moist air or water. Combines vigorously or explosively with water. Under normal storage conditions, peroxidizable compounds can form and accumulate peroxides which may explode when subjected to heat or shock. This material is most hazardous when peroxide levels are concentrated by distillation or evaporation. THF should never be

distilled to dryness. Prolonged exposure to air, even from extended storage time, can deplete BHT inhibitor and rapidly accelerate THF-peroxide formation.

Conditions to Avoid: Light, ignition sources, contact with water, excess heat, evaporating to near dryness, prolonged exposure to air, confined spaces.

Incompatibilities with Other Materials: Sodium aluminum hydride, sodium tetrahydroaluminate, lithium tetrahydroaluminate, borane, metal halides, strong oxidizing agents, strong acids, oxygen, caustic alkalis, bromine, water.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, hydrogen bromide, oxides of magnesium.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 109-99-9: LU5950000

CAS# 75-16-1 unlisted.

LD50/LC50:

CAS# 109-99-9:

Inhalation, rat: LC50 = 21000 ppm/3H;

Oral, rat: LD50 = 1650 mg/kg;

CAS# 75-16-1:

Carcinogenicity:

CAS# 109-99-9:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans
- **California:** Not listed.
- **NTP:** Not listed.
- **IARC:** Not listed.

CAS# 75-16-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: Animal data show developmental effects only at exposure levels producing other toxic effects in the adult animal.

Reproductive Effects: Animal testing for reproductive effects shows no change in reproductive performance.

Mutagenicity: THF has not produced genetic damage in mammalian cell cultures or in animals. It has not been tested for its ability to cause permanent genetic damage in reproductive cells of mammals (not tested for heritable genetic damage).

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Fathead Minnow: LC50 = 2160 mg/L; 96 Hr; Flow through bioassay (pH 7.5)

Water flea Daphnia: EC50 = 5930 mg/L; 24 Hr

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series:

CAS# 109-99-9: waste number U213 (Ignitable waste).

Section 14 - Transport Information

| | US DOT | Canada TDG |
|-----------------------|--|--|
| Shipping Name: | COMPOUND DISPERSION, WATER-REACTIVE, FLAMMABLE, N.O.S. | ORGANOMETALLIC COMPOUND DISPERSION, WATE |
| Hazard Class: | 4.3 | 4.3 |
| UN Number: | UN3207 | UN3207 |
| Packing Group: | I | I |

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 109-99-9 is listed on the TSCA inventory.

CAS# 75-16-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

CAS# 109-99-9: Testing required by manufacturers, processors; Test for Health Effects

Section 12b

CAS# 109-99-9: Section 4

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 109-99-9: 1000 lb final RQ; 454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 109-99-9: immediate, fire, reactive.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 109-99-9 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 75-16-1 can be found on the following state right to know lists: New Jersey.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

F C

Risk Phrases:

R 11 Highly flammable.

R 14/15 Reacts violently with water liberating extremely flammable gases.

R 19 May form explosive peroxides.

R 34 Causes burns.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 33 Take precautionary measures against static discharges.

S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 7/8 Keep container tightly closed and dry.

S 8 Keep container dry.

S 6A Keep under nitrogen.

S 43B In case of fire, use fire-fighting equipment on basis of sodium chloride, sodium bicarbonate (never use water).

WGK (Water Danger/Protection)

CAS# 109-99-9: 1

CAS# 75-16-1: No information available.

Canada - DSL/NDSL

CAS# 109-99-9 is listed on Canada's DSL List.

CAS# 75-16-1 is listed on Canada's NDSL List.

Canada - WHMIS

This product has a WHMIS classification of B2, E, F.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 109-99-9 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 9/20/2004

Revision #1 Date: 10/14/2004

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.