

SAFETY DATA SHEET

Version 6.4
Revision Date 04/18/2021
Print Date 10/24/2021**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifiers**

Product name : Vinylmagnesium chloride solution

Product Number : 476552
Brand : Aldrich**1.2 Relevant identified uses of the substance or mixture and uses advised against**

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheetCompany : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATESTelephone : +1 314 771-5765
Fax : +1 800 325-5052**1.4 Emergency telephone**Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-
527-3887 CHEMTREC (International) 24
Hours/day; 7 Days/week**SECTION 2: Hazards identification****2.1 Classification of the substance or mixture****GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**

Flammable liquids (Category 2), H225

Chemicals which, in contact with water, emit flammable gases (Category 1), H260

Acute toxicity, Oral (Category 4), H302

Skin corrosion (Category 1B), H314

Serious eye damage (Category 1), H318

Carcinogenicity (Category 2), H351

Specific target organ toxicity - single exposure (Category 3), Respiratory system, Central nervous system, H335, H336

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



| | |
|----------------------------|--|
| Signal word | Danger |
| Hazard statement(s) | |
| H225 | Highly flammable liquid and vapor. |
| H260 | In contact with water releases flammable gases which may ignite spontaneously. |
| H302 | Harmful if swallowed. |
| H314 | Causes severe skin burns and eye damage. |
| H335 | May cause respiratory irritation. |
| H336 | May cause drowsiness or dizziness. |
| H351 | Suspected of causing cancer. |
| Precautionary statement(s) | |
| P201 | Obtain special instructions before use. |
| P202 | Do not handle until all safety precautions have been read and understood. |
| P210 | Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking. |
| P223 | Do not allow contact with water. |
| P231 + P232 | Handle under inert gas. Protect from moisture. |
| P233 | Keep container tightly closed. |
| P240 | Ground/bond container and receiving equipment. |
| P241 | Use explosion-proof electrical/ ventilating/ lighting/ equipment. |
| P242 | Use only non-sparking tools. |
| P243 | Take precautionary measures against static discharge. |
| P261 | Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray. |
| P264 | Wash skin thoroughly after handling. |
| P270 | Do not eat, drink or smoke when using this product. |
| P271 | Use only outdoors or in a well-ventilated area. |
| P280 | Wear protective gloves/ protective clothing/ eye protection/ face protection. |
| P301 + P312 + P330 | IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth. |
| P301 + P330 + P331 | IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. |
| P303 + P361 + P353 | IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower. |
| P304 + P340 + P310 | IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor. |
| P305 + P351 + P338 + P310 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor. |
| P308 + P313 | IF exposed or concerned: Get medical advice/ attention. |
| P335 + P334 | Brush off loose particles from skin. Immerse in cool water/ wrap in wet bandages. |
| P363 | Wash contaminated clothing before reuse. |
| P370 + P378 | In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish. |
| P402 + P404 | Store in a dry place. Store in a closed container. |
| P403 + P233 | Store in a well-ventilated place. Keep container tightly closed. |
| P403 + P235 | Store in a well-ventilated place. Keep cool. |
| P405 | Store locked up. |
| P501 | Dispose of contents/ container to an approved waste disposal plant. |

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

Reacts violently with water., May form explosive peroxides.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Formula : C₂H₃ClMg
Molecular weight : 86.80 g/mol

| Component | Classification | Concentration |
|---|---|-------------------|
| Tetrahydrofuran | | |
| CAS-No. 109-99-9 EC-No. 203-726-8 Index-No. 603-025-00-0 Registration number 01-2119444314-46-XXXX | Flam. Liq. 2; Acute Tox. 4; Eye Irrit. 2A; Carc. 2; STOT SE 3; H225, H302, H319, H351, H335, H336 Concentration limits: >= 25 %: Eye Irrit. 2, H319; >= 25 %: STOT SE 3, H335; | >= 70 - < 90 % |
| Chlorovinylmagnesium | | |
| CAS-No. 3536-96-7 EC-No. 222-575-9 | 1; Skin Corr. 1B; Eye Dam. 1; H260, H314, H318 | >= 10 - < 20 % |

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice

Consult a physician. Show this material safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during transport to hospital.

If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

Aldrich - 476552

Page 3 of 13

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

Dry powder

5.2 Special hazards arising from the substance or mixture

Carbon oxides

Hydrogen chloride gas

Magnesium oxide

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.

For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Do not flush with water.

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling

Avoid contact with skin and eyes. Avoid inhalation of vapor or mist.

Advice on protection against fire and explosion

Use explosion-proof equipment. **Advice on protection against fire and explosion**

Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

Hygiene measures

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions

Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Never allow product to get in contact with water during storage.

Store under inert gas. Dry residue is explosive. Test for peroxide formation periodically and before distillation. Dry residue is explosive. Store under inert gas. Test for peroxide formation periodically and before distillation.

Storage class (TRGS 510): 4.3: Hazardous materials, which set free flammable gases upon contact with water

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

| Component | CAS-No. | Value | Control parameters | Basis |
|-----------------|----------|--|--------------------|---|
| Tetrahydrofuran | 109-99-9 | TWA | 50 ppm | USA. ACGIH Threshold Limit Values (TLV) |
| | Remarks | Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption | | |
| | | STEL | 100 ppm | USA. ACGIH Threshold Limit Values (TLV) |
| | | Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption | | |

| | | | | |
|--|--|------|----------------------------------|---|
| | | ST | 250 ppm 735 mg/m ³ | USA. NIOSH Recommended Exposure Limits |
| | | TWA | 200 ppm 590 mg/m ³ | USA. NIOSH Recommended Exposure Limits |
| | | TWA | 200 ppm 590 mg/m ³ | USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants |
| | | TWA | 200 ppm 590 mg/m ³ | USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000 |
| | | STEL | 250 ppm 735 mg/m ³ | USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000 |
| | | PEL | 200 ppm 590 mg/m ³ | California permissible exposure limits for chemical contaminants (Title 8, Article 107) |
| | | STEL | 250 ppm 735 mg/m ³ | California permissible exposure limits for chemical contaminants (Title 8, Article 107) |

Biological occupational exposure limits

| Component | CAS-No. | Parameters | Value | Biological specimen | Basis |
|-----------------|----------|--|--------|---------------------|---|
| Tetrahydrofuran | 109-99-9 | Tetrahydrofuran | 2 mg/l | Urine | ACGIH - Biological Exposure Indices (BEI) |
| | Remarks | End of shift (As soon as possible after exposure ceases) | | | |

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Tightly fitting safety goggles. Faceshield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Splash contact

Material: butyl-rubber

Minimum layer thickness: 0.3 mm

Break through time: 10 min

Material tested: Butoject® (KCL 897 / Aldrich Z677647, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the EC approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

- | | |
|---|-----------------------------------|
| a) Appearance | Form: liquid Color: dark brown |
| b) Odor | No data available |
| c) Odor Threshold | No data available |
| d) pH | No data available |
| e) Melting point/freezing point | No data available |
| f) Initial boiling point and boiling range | No data available |
| g) Flash point | -17 °C (1 °F) - closed cup |
| h) Evaporation rate | No data available |
| i) Flammability (solid, gas) | No data available |
| j) Upper/lower flammability or explosive limits | No data available |
| k) Vapor pressure | No data available |
| l) Vapor density | No data available |
| m) Relative density | No data available |
| n) Water solubility | No data available |
| o) Partition coefficient: n-octanol/water | No data available |
| p) Autoignition | No data available |

Aldrich - 476552

Page 7 of 13

- temperature
- q) Decomposition temperature No data available
- r) Viscosity No data available
- s) Explosive properties No data available
- t) Oxidizing properties No data available

9.2 Other safety information

No data available

SECTION 10: Stability and reactivity

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

Vapors may form explosive mixture with air.
Reacts violently with water.

10.4 Conditions to avoid

Heat, flames and sparks. Exposure to moisture.

10.5 Incompatible materials

Oxidizing agents, Oxygen, Reacts violently with water.

10.6 Hazardous decomposition products

In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Mixture

Acute toxicity

No data available

Acute toxicity estimate Oral - 1,922 mg/kg
(Calculation method)

Inhalation: No data available

Dermal: No data available

Acute toxicity estimate Dermal - 2,912 mg/kg
(Calculation method)

No data available

Aldrich - 476552

Page 8 of 13

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitization

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure

No data available

No data available

Specific target organ toxicity - repeated exposure**Aspiration hazard**

No data available

11.2 Additional Information

Not available

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea

Stomach - Irregularities - Based on Human Evidence

Components**Tetrahydrofuran****Acute toxicity**

LD50 Oral - Rat - male and female - 1,650 mg/kg

Remarks:

(ECHA)

Symptoms: Irritation of mucous membranes

LC50 Inhalation - Rat - male and female - 4 h - > 16.9 mg/l

(US-EPA)

Symptoms: mucosal irritations, Cough, Shortness of breath, Possible damages:, damage of respiratory tract

Inhalation: Irritating to respiratory system.

LD50 Dermal - Rat - male and female - > 2,000 mg/kg
(OECD Test Guideline 402)

No data available

Skin corrosion/irritation

Skin - Rabbit

Result: No skin irritation - 72 h
(Draize Test)

Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.

Serious eye damage/eye irritation

Eyes - Rabbit

Result: Eye irritation

Remarks:

(ECHA)

(Regulation (EC) No 1272/2008, Annex VI)

Respiratory or skin sensitization

Local lymph node assay (LLNA) - Mouse

Result: negative

(OECD Test Guideline 429)

Germ cell mutagenicity

In vivo tests did not show mutagenic effects

In vitro mammalian cell gene mutation test

Chinese hamster ovary cells

Result: negative

Ames test

Salmonella typhimurium

Result: negative

Carcinogenicity

Suspected of causing cancer.

IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity

No toxicity to reproduction

Specific target organ toxicity - single exposure

Inhalation - May cause respiratory irritation. - Respiratory system

May cause drowsiness or dizziness. - Nervous system

Acute oral toxicity - Irritation of mucous membranes

Acute inhalation toxicity - mucosal irritations, Cough, Shortness of breath, Possible damages:, damage of respiratory tract

Specific target organ toxicity - repeated exposure

The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Aspiration hazard
No aspiration toxicity classification

Chlorovinylmagnesium

Acute toxicity

No data available

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitization

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

SECTION 12: Ecological information

12.1 Toxicity

Mixture

No data available

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

Aldrich - 476552

Page 11 of 13

12.6 Other adverse effects

No data available

Components

Tetrahydrofuran

| | |
|---|--|
| Toxicity to fish | flow-through test LC50 - Pimephales promelas (fathead minnow) - 2,160 mg/l - 96 h (OECD Test Guideline 203) |
| Toxicity to daphnia and other aquatic invertebrates | static test EC50 - Daphnia magna (Water flea) - 3,485 mg/l - 48 h (OECD Test Guideline 202) |
| Toxicity to bacteria | static test EC20 - activated sludge - ca. 800 mg/l - 0.5 h (OECD Test Guideline 209) |

Chlorovinylmagnesium

No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging

Dispose of as unused product.

SECTION 14: Transport information

DOT (US)

UN number: 3399 Class: 4.3 (3) Packing group: I
Proper shipping name: Organometallic substance, liquid, water-reactive, flammable
(Tetrahydrofuran, Chlorovinylmagnesium)
Reportable Quantity (RQ): 1164 lbs
Poison Inhalation Hazard: No

IMDG

UN number: 3399 Class: 4.3 (3) Packing group: I EMS-No: F-G, S-N
Proper shipping name: ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE,
FLAMMABLE (Chlorovinylmagnesium, Tetrahydrofuran)

IATA

UN number: 3399 Class: 4.3 (3) Packing group: I
Proper shipping name: Organometallic substance, liquid, water-reactive, flammable
(Chlorovinylmagnesium, Tetrahydrofuran)
IATA Passenger: Not permitted for transport

SECTION 15: Regulatory information

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards

Fire Hazard, Reactivity Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

No components are subject to the Massachusetts Right to Know Act.

SECTION 16: Other information

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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