

SAFETY DATA SHEET

1-Propenylmagnesium bromide, 0.5 M in THF

According to the REACH etc. (Amendment etc.) (EU Exit) Regulations 2020 No. 1577, as amended.

SECTION 1: Identification of the	e substance/mixture and of the company/undertaking	
1.1. Product identifier		
Product name	1-Propenylmagnesium bromide, 0.5 M in THF	
CAS number	14092-04-7	
EC number	683-635-1	
1.2. Relevant identified uses of the substance or mixture and uses advised against		
Identified uses	For research purposes only.	
Uses advised against	No specific uses advised against are identified.	
1.3. Details of the supplier of the safety data sheet		
Supplier	Molekula Ltd.	
	Lingfield Way,	
	Darlington,	
	DL1 4XX,	
	United Kingdom	
	+44 (0) 3302000333	
	info@molekula.com	
1.4. Emergency telephone number		

+44 (0) 7769276927

SECTION 2: Hazards identification	
2.1. Classification of the substance or mixture	
Classification (SI 2019 No. 720)	
Physical hazards	Flam. Liq. 2 - H225 Water-react. 1 - H260
Health hazards	Acute Tox. 4 - H302 Acute Tox. 4 - H332 Skin Corr. 1B - H314 Eye Dam. 1 - H318 Carc. 2 - H351 STOT SE 3 - H335
Environmental hazards	Not Classified
2.2. Label elements	
EC number	683-635-1
Hazard pictograms	

Signal word

Danger

Hazard statements	 H225 Highly flammable liquid and vapour. H260 In contact with water releases flammable gases which may ignite spontaneously. H302+H332 Harmful if swallowed or if inhaled. H314 Causes severe skin burns and eye damage. H351 Suspected of causing cancer. H335 May cause respiratory irritation.
Precautionary statements	 P201 Obtain special instructions before use. P202 Do not handle until all safety precautions have been read and understood. P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P223 Do not allow contact with water. P231+P232 Handle and store contents under inert gas. Protect from moisture. P240 Ground and bond container and receiving equipment. P241 Use explosion-proof electrical equipment. P242 Use non-sparking tools. P243 Take action to prevent static discharges. P260 Do not breathe vapour/ spray. P261 Avoid breathing vapour/ spray. P264 Wash contaminated skin thoroughly after handling. P271 Use only outdoors or in a well-ventilated area. P280 Wear protective gloves/ protective clothing/ eye protection/ face protection. P302+P335+P334 IF ON SKIN: Brush off loose particles from skin. Immerse in cool water or wrap in wet bandages. P301+P312 IF SWALLOWED: Call a POISON CENTRE/doctor if you feel unwell. P303+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing. P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing. P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P308+P313 IF exposed or concerned: Get medical advice/ attention. P310 Immediately call a POISON CENTRE/ doctor. P363 Wash contaminated clothing before reuse. P370+P378 In case of fire: Use foam, carbon dioxide, dry powder or water fog to extinguish. P402+P404 Store in a dry place. Store in a closed container. P403+P233 Istore 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 in accordance with national regulations.
Supplemental label information	EUH019 May form explosive peroxides.
Contains	tetrahydrofuran, 1-Propenylmagnesium bromide
2.3. Other hazards	

This product does not contain any substances classified as PBT or vPvB.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

tetrahydrofuran	90-95%
CAS number: 109-99-9	EC number: 203-726-8
Classification Flam. Liq. 2 - H225 Acute Tox. 4 - H302 Acute Tox. 4 - H332 Eye Irrit. 2 - H319 Carc. 2 - H351 STOT SE 3 - H335	
1-Propenylmagnesium brom CAS number: 14092-04-7	nide 10-25%
Classification Water-react. 1 - H260 Skin Corr. 1B - H314 Eye Dam. 1 - H318	
The Full Text for all R-Phrase	es and Hazard Statements are Displayed in Section 16.
SECTION 4: First aid measu	
4.1. Description of first aid m	
General information	Get medical attention if any discomfort continues. Show this Safety Data Sheet to the medical personnel. Chemical burns must be treated by a physician.
Inhalation	Move affected person to fresh air and keep warm and at rest in a position comfortable for breathing. Maintain an open airway. Loosen tight clothing such as collar, tie or belt. When breathing is difficult, properly trained personnel may assist affected person by administering oxygen. Get medical attention. Place unconscious person on their side in the recovery position and ensure breathing can take place.
Ingestion	Rinse mouth thoroughly with water. Give a few small glasses of water or milk to drink. Stop if the affected person feels sick as vomiting may be dangerous. Never give anything by mouth to an unconscious person. Place unconscious person on their side in the recovery position and ensure breathing can take place. Keep affected person under observation. Get medical attention if symptoms are severe or persist.
Skin contact	It is important to remove the substance from the skin immediately. Rinse immediately with plenty of water. Continue to rinse for at least 15 minutes and get medical attention. Chemical burns must be treated by a physician.
Eye contact	Rinse immediately with plenty of water. Do not rub eye. Remove any contact lenses and open eyelids wide apart. Continue to rinse for at least 15 minutes and get medical attention.
Protection of first aiders	It may be dangerous for first aid personnel to carry out mouth-to-mouth resuscitation.
4.2. Most important symptom	ns and effects, both acute and delayed
General information	The severity of the symptoms described will vary dependent on the concentration and the length of exposure.
Inhalation	A single exposure may cause the following adverse effects: Severe irritation of nose and throat. Symptoms following overexposure may include the following: Corrosive to the respiratory tract. Prolonged or repeated exposure may cause the following adverse effects: Suspected of causing cancer.

Ingestion	May cause chemical burns in mouth, oesophagus and stomach. Symptoms following overexposure may include the following: Severe stomach pain. Nausea, vomiting. Prolonged or repeated exposure may cause the following adverse effects: Suspected of causing cancer.
Skin contact	Causes severe burns. Symptoms following overexposure may include the following: Pain or irritation. Redness. Blistering may occur. Prolonged or repeated exposure may cause the following adverse effects: Suspected of causing cancer.
Eye contact	Causes serious eye damage. Symptoms following overexposure may include the following: Pain. Profuse watering of the eyes. Redness.
4.3. Indication of any immediate medical attention and special treatment needed	

Notes for the doctor Treat symptomatically. **SECTION 5: Firefighting measures** 5.1. Extinguishing media Suitable extinguishing media Extinguish with alcohol-resistant foam, carbon dioxide or dry powder. Use fire-extinguishing media suitable for the surrounding fire. Unsuitable extinguishing Do not use water, if avoidable. media 5.2. Special hazards arising from the substance or mixture Specific hazards Reacts with water. Containers can burst violently or explode when heated, due to excessive pressure build-up. Flammable liquid and vapour. Vapours may be ignited by a spark, a hot surface or an ember. Vapours may form explosive mixtures with air. Fire-water run-off in sewers may create fire or explosion hazard. This product is toxic. Severe corrosive hazard. Water used for fire extinguishing, which has been in contact with the product, may be corrosive Hazardous combustion Thermal decomposition or combustion products may include the following substances: products Very toxic or corrosive gases or vapours. Carbon dioxide (CO2). Carbon monoxide (CO). Oxides of the following substances: Magnesium. Hydrogen bromide (HBr). 5.3. Advice for firefighters Protective actions during Avoid breathing fire gases or vapours. Evacuate area. Keep upwind to avoid inhalation of firefighting gases, vapours, fumes and smoke. Ventilate closed spaces before entering them. Avoid discharge to the aquatic environment. Control run-off water by containing and keeping it out of sewers and watercourses. If risk of water pollution occurs, notify appropriate authorities. Special protective equipment Regular protection may not be safe. Wear chemical protective suit. Wear positive-pressure for firefighters self-contained breathing apparatus (SCBA) and appropriate protective clothing. Firefighter's clothing will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautionsWear protective clothing as described in Section 8 of this safety data sheet. No action shall be
taken without appropriate training or involving any personal risk. Do not touch or walk into
spilled material. Evacuate area. Provide adequate ventilation. No smoking, sparks, flames or
other sources of ignition near spillage. Promptly remove any clothing that becomes
contaminated. Avoid inhalation of vapours and spray/mists. Use suitable respiratory protection
if ventilation is inadequate. Avoid contact with skin and eyes.

6.2. Environmental precautions

Environmental precautions

Avoid discharge into drains or watercourses or onto the ground. Avoid discharge to the aquatic environment.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up Wear protective clothing as described in Section 8 of this safety data sheet. Clear up spills immediately and dispose of waste safely. Eliminate all ignition sources if safe to do so. No smoking, sparks, flames or other sources of ignition near spillage. Do not allow material to enter confined spaces, due to the risk of explosion. This product is corrosive. Provide adequate ventilation. Absorb small quantities with paper towels and evaporate in a safe place. Once evaporation is complete, place paper in a suitable waste disposal container and seal securely. Large Spillages: If the product is soluble in water, dilute the spillage with water and mop it up. Alternatively, or if it is not water-soluble, absorb the spillage with an inert, dry material and place it in a suitable waste disposal container. The contaminated absorbent may pose the same hazard as the spilled material. Label the containers containing waste and contaminated materials and remove from the area as soon as possible. Flush contaminated area with plenty of water. Wash thoroughly after dealing with a spillage. For waste disposal, see Section 13.

6.4. Reference to other sections

Reference to other sections

For personal protection, see Section 8. See Section 11 for additional information on health hazards. See Section 12 for additional information on ecological hazards. For waste disposal, see Section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Occupational exposure limits

Usage precautions	Read and follow manufacturer's recommendations. Wear protective clothing as described in Section 8 of this safety data sheet. Keep away from food, drink and animal feeding stuffs. Handle all packages and containers carefully to minimise spills. Keep container tightly sealed when not in use. Avoid the formation of mists. The product is flammable. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. This product is corrosive. Immediate first aid is imperative. Suspected of causing cancer. Do not handle until all safety precautions have been read and understood. Do not handle broken packages without protective equipment. Do not reuse empty containers.	
Advice on general occupational hygiene	Wash promptly if skin becomes contaminated. Take off contaminated clothing. Wash contaminated clothing before reuse.	
7.2. Conditions for safe storage, including any incompatibilities		
Storage precautions	Store away from incompatible materials (see Section 10). Store locked up. Keep away from oxidising materials, heat and flames. Avoid contact with water. Keep only in the original container. Keep container tightly closed, in a cool, well ventilated place. Keep containers upright. Protect containers from damage.	
	Store at temperatures between 2°C/35.6°F and 8°C/46.4°F.	
Storage class	Water-reactive storage.	
7.3. Specific end use(s)		
Specific end use(s)	The identified uses for this product are detailed in Section 1.2.	
SECTION 8: Exposure controls/Personal protection		
8.1. Control parameters		

tetrahydrofuran

Long-term exposure limit (8-hour TWA): WEL 50 ppm 150 mg/m³ Short-term exposure limit (15-minute): WEL 100 ppm 300 mg/m³ Sk

WEL = Workplace Exposure Limit. Sk = Can be absorbed through the skin.

8.2. Exposure controls

Protective equipment



controls	regularly maintained and tested. Good general ventilation should be adequate to control worker exposure to airborne contaminants. Observe any occupational exposure limits for the product or ingredients.
Eye/face protection	Wear tight-fitting, chemical splash goggles or face shield. If inhalation hazards exist, a full- face respirator may be required instead.
Hand protection	Wear protective gloves. The most suitable glove should be chosen in consultation with the glove supplier/manufacturer, who can provide information about the breakthrough time of the glove material. To protect hands from chemicals, wear gloves that are proven to be impervious to the chemical and resist degradation. Considering the data specified by the glove manufacturer, check during use that the gloves are retaining their protective properties and change them as soon as any deterioration is detected. Frequent changes are recommended.
Other skin and body protection	Wear appropriate clothing to prevent any possibility of skin contact.
Hygiene measures	Wash after use and before eating, smoking and using the toilet. Do not eat, drink or smoke when using this product.
Respiratory protection	Ensure all respiratory protective equipment is suitable for its intended use and is 'UKCA'- marked. Check that the respirator fits tightly and the filter is changed regularly. Gas and combination filter cartridges suitable for intended use should be used. Full face mask respirators with replaceable filter cartridges suitable for intended use should be used. Half mask and quarter mask respirators with replaceable filter cartridges suitable for intended use should be used.
Environmental exposure controls	Keep container tightly sealed when not in use. Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	Liquid.
Colour	Light (or pale). Yellow. to Orange. to Brown.
Odour	Not known.
Odour threshold	No information available.
рН	No information available.

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the product: htly or explode lation of sparks
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ntly or explode

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Hazardous decomposition	Does not decompose when used and stored as recommended.
products	Thermal decomposition or combustion products may include the following substances:
	Corrosive gases or vapours.
	Carbon dioxide (CO2).
	Carbon monoxide (CO).
	Oxides of:
	Hydrogen bromide (HBr).
	Magnesium.

SECTION 11: Toxicological information

11.1. Information on toxicological effects		
Acute toxicity - oral		
Summary	Harmful if swallowed.	
ATE oral (mg/kg)	1,833.33	
Acute toxicity - dermal		
Summary	Based on available data the classification criteria are not met.	
Acute toxicity - inhalation		
Summary	Harmful if inhaled.	
ATE inhalation (vapours mg/l)	18.78	
Skin corrosion/irritation		
Summary	Causes severe skin burns and eye damage.	
Serious eye damage/irritation		
Summary	Causes serious eye damage.	
Respiratory sensitisation		
Summary	Based on available data the classification criteria are not met.	
Skin sensitisation		
Summary	Based on available data the classification criteria are not met.	
Germ cell mutagenicity		
Summary	Based on available data the classification criteria are not met.	
Carcinogenicity		
Summary	Suspected of causing cancer.	
IARC carcinogenicity	Contains a substance which may be potentially carcinogenic. IARC Group 2B Possibly carcinogenic to humans.	
Reproductive toxicity		
Summary	Based on available data the classification criteria are not met.	
Specific target organ toxicity - single exposure		
Summary	May cause respiratory irritation.	
Target organs	Respiratory system, lungs	
Specific target organ toxicity -		
Summary	Based on available data the classification criteria are not met.	
Aspiration hazard		
Summary	Based on available data the classification criteria are not met.	

1-Propenylmagnesium bromide, 0.5 M in THF

General information	May cause cancer after repeated exposure. Risk of cancer depends on duration and level of exposure. The severity of the symptoms described will vary dependent on the concentration and the length of exposure.
Inhalation	Corrosive to the respiratory tract. Symptoms following overexposure may include the following: Severe irritation of nose and throat.
Ingestion	May cause chemical burns in mouth, oesophagus and stomach. Symptoms following overexposure may include the following: Severe stomach pain. Nausea, vomiting.
Skin contact	Causes severe burns. Symptoms following overexposure may include the following: Pain or irritation. Redness. Blistering may occur.
Eye contact	Causes serious eye damage. Symptoms following overexposure may include the following: Pain. Profuse watering of the eyes. Redness.
Route of exposure	Ingestion Inhalation Skin and/or eye contact
Target organs	Respiratory system, lungs
SECTION 12: Ecological inform	mation
Ecotoxicity	Not regarded as dangerous for the environment. However, large or frequent spills may have hazardous effects on the environment.
12.1. Toxicity	
Acute aquatic toxicity	
Summary	Based on available data the classification criteria are not met.
Chronic aquatic toxicity Summary	Based on available data the classification criteria are not met.
12.2. Persistence and degrada	ability
Persistence and degradability	Reacts with water.
12.3. Bioaccumulative potentia	<u>al</u>
Bioaccumulative potential	No data available on bioaccumulation.
Partition coefficient	No information available.
12.4. Mobility in soil	
Mobility	No data available.
12.5. Results of PBT and vPvB assessment	
12.6. Other adverse effects	
Other adverse effects	None known.
SECTION 13: Disposal considerations	
13.1. Waste treatment method	

General information The generation of waste should be minimised or avoided wherever possible. Reuse or recycle products wherever possible. This material and its container must be disposed of in a safe way. When handling waste, the safety precautions applying to handling of the product should be considered. Care should be taken when handling emptied containers that have not been thoroughly cleaned or rinsed out. Empty containers or liners may retain some product residues and hence be potentially hazardous.

Disposal methods Do not empty into drains. Dispose of surplus products and those that cannot be recycled via a licensed waste disposal contractor. Waste, residues, empty containers, discarded work clothes and contaminated cleaning materials should be collected in designated containers, labelled with their contents. Incineration or landfill should only be considered when recycling is not feasible.

SECTION 14: Transport information

14.1. UN number	
UN No. (ADR/RID)	3399
UN No. (IMDG)	3399
UN No. (ICAO)	3399
UN No. (ADN)	3399

14.2. UN proper shipping name

Proper shipping name (ADR/RID)	ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE, FLAMMABLE (1- Propenylmagnesium bromide, 0.5 M in THF)		
Proper shipping name (IMDG)	ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE, FLAMMABLE (1- Propenylmagnesium bromide, 0.5 M in THF)		
Proper shipping name (ICAO)	ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE, FLAMMABLE (1- Propenylmagnesium bromide, 0.5 M in THF)		
Proper shipping name (ADN)	ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE, FLAMMABLE (1- Propenylmagnesium bromide, 0.5 M in THF)		
14.3. Transport hazard class(es)			
ADR/RID class	4.3		
ADR/RID subsidiary risk	3		
ADR/RID classification code	WF1		
ADR/RID label	4.3		
IMDG class	4.3		
IMDG subsidiary risk	3		
ICAO class/division	4.3		
ICAO subsidiary risk	3		
ADN class	4.3		

ADN subsidiary risk

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Transport labels



14.4. Packing group		
ADR/RID packing group		
IMDG packing group		
ICAO packing group		

ADN packing group	1				
14.5. Environmental hazards					
Environmentally hazardous substance/marine pollutant No.					
14.6. Special precautions for user					
EmS	F-G, S-N				
ADR transport category	0				
Emergency Action Code	4W				
Hazard Identification Number (ADR/RID)	X323				
Tunnel restriction code	(B/E)				
14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code					
SECTION 15: Regulatory information					
15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture					
National regulations	Health and Safety at Work etc. Act 1974 (as amended). The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (SI 2009 No. 1348) (as amended) ["CDG 2009"]. EH40/2005 Workplace exposure limits.				

15.2. Chemical safety assessment

No chemical safety assessment has been carried out.

Inventories

EU - EINECS/ELINCS

None of the ingredients are listed or exempt.

SECTION 16: Other information

Abbreviations and acronyms used in the safety data sheet	ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road. ADN: European Agreement concerning the International Carriage of Dangerous Goods by
	Inland Waterways. RID: European Agreement concerning the International Carriage of Dangerous Goods by Rail.
	IATA: International Air Transport Association.
	ICAO: Technical Instructions for the Safe Transport of Dangerous Goods by Air.
	IMDG: International Maritime Dangerous Goods.
	CAS: Chemical Abstracts Service.
	ATE: Acute Toxicity Estimate.
	LC50: Lethal Concentration to 50 % of a test population.
	LD50: Lethal Dose to 50% of a test population (Median Lethal Dose).
	EC₅₀: 50% of maximal Effective Concentration.
	PBT: Persistent, Bioaccumulative and Toxic substance.
	vPvB: Very Persistent and Very Bioaccumulative.

Classification abbreviations and acronyms	Flam. Liq. = Flammable liquid Water-react. = Substance or mixture which in contact with water emits flammable gas Acute Tox. = Acute toxicity Carc. = Carcinogenicity Eye Dam. = Serious eye damage Skin Corr. = Skin corrosion STOT SE = Specific target organ toxicity-single exposure
Classification procedures according to SI 2019 No. 720	Acute Tox. 4 - H332: Acute Tox. 4 - H302: Eye Dam. 1 - H318: Skin Corr. 1B - H314: STOT SE 3 - H335: Carc. 2 - H351: : Calculation method. Flam. Liq. 2 - H225: Water-react. 1 - H260: : Expert judgement.
Training advice	Only trained personnel should use this material.
Revision date	16/09/2022
Revision	1
SDS number	1517
Hazard statements in full	 H225 Highly flammable liquid and vapour. H260 In contact with water releases flammable gases which may ignite spontaneously. H302 Harmful if swallowed. H314 Causes severe skin burns and eye damage. H318 Causes serious eye damage. H319 Causes serious eye irritation. H332 Harmful if inhaled. H335 May cause respiratory irritation. H351 Suspected of causing cancer.

This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty, guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use.