

# SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Version 8.6

Revision Date 25.12.2023

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GENERIC EU MSDS - NO COUNTRY SPECIFIC DATA - NO OEL DATA

## SECTION 1: Identification of the substance/mixture and of the company/undertaking

### 1.1 Product identifiers

Product name : Tetrahydrofuran

Product Number : 360589

Brand : SIGALD

Index-No. : 603-025-00-0

REACH No. : 01-2119444314-46-XXXX

CAS-No. : 109-99-9

### 1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Manufacture of substances

### 1.3

CHEMIKART

### 1.4 Emergency telephone

Emergency Phone # : 000 800 1007 141 (CHEMTREC)

## SECTION 2: Hazards identification

### 2.1 Classification of the substance or mixture

Flammable liquids, (Category 2) H225: Highly flammable liquid and vapor.

Acute toxicity, (Category 4) H302: Harmful if swallowed.

Eye irritation, (Category 2) H319: Causes serious eye irritation.

Carcinogenicity, (Category 2) H351: Suspected of causing cancer.

Specific target organ toxicity - H336: May cause drowsiness or dizziness.

single exposure, (Category 3),  
Central nervous system

Specific target organ toxicity -  
single exposure, (Category 3),  
Respiratory system

H335: May cause respiratory irritation.

## 2.2 Label elements

### Labelling according Regulation (EC) No 1272/2008

#### Pictogram

|                                      |                                                                                                                                  |
|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Signal Word                          | Danger                                                                                                                           |
| Hazard Statements                    |                                                                                                                                  |
| H225                                 | Highly flammable liquid and vapor.                                                                                               |
| H302                                 | Harmful if swallowed.                                                                                                            |
| H319                                 | Causes serious eye irritation.                                                                                                   |
| H335                                 | May cause respiratory irritation.                                                                                                |
| H336                                 | May cause drowsiness or dizziness.                                                                                               |
| H351                                 | Suspected of causing cancer.                                                                                                     |
| Precautionary Statements             |                                                                                                                                  |
| 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.                                   |
| P233                                 | Keep container tightly closed.                                                                                                   |
| P301 + P312                          | IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell.                                                                   |
| 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.                                                                          |
| Supplemental Hazard information (EU) |                                                                                                                                  |
| EUH019                               | May form explosive peroxides.                                                                                                    |

### Reduced Labeling (<= 125 ml)

#### Pictogram

|                          |                                                                           |
|--------------------------|---------------------------------------------------------------------------|
| Signal Word              | Danger                                                                    |
| Hazard Statements        |                                                                           |
| H351                     | Suspected of causing cancer.                                              |
| Precautionary Statements |                                                                           |
| P202                     | Do not handle until all safety precautions have been read and understood. |
| P308 + P313              | IF exposed or concerned: Get medical advice/ attention.                   |

### 2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Ecological information:

The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Toxicological information:

The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

## SECTION 3: Composition/information on ingredients

### 3.1 Substances

Formula : C<sub>4</sub>H<sub>8</sub>O  
Molecular weight : 72,11 g/mol  
CAS-No. : 109-99-9  
EC-No. : 203-726-8  
Index-No. : 603-025-00-0

| Component              |              | Classification                                                                                                                                                                      | Concentration |
|------------------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| <b>Tetrahydrofuran</b> |              |                                                                                                                                                                                     |               |
| CAS-No.                | 109-99-9     | Flam. Liq. 2; Acute Tox. 4; Eye Irrit. 2; Carc. 2; STOT SE 3; H225, H302, H319, H351, H336, H335<br>Concentration limits:<br>>= 25 %: Eye Irrit. 2, H319; >= 25 %: STOT SE 3, H335; | <= 100 %      |
| EC-No.                 | 5-53         |                                                                                                                                                                                     |               |
| Index-No.              | 603-025-00-0 |                                                                                                                                                                                     |               |

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

Show this material safety data sheet to the doctor in attendance.

#### If inhaled

After inhalation: fresh air. Call in physician.

#### In case of skin contact

In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Consult a physician.

**In case of eye contact**

After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

**If swallowed**

After swallowing: immediately make victim drink water (two glasses at most). 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

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**SECTION 5: Firefighting measures****5.1 Extinguishing media****Suitable extinguishing media**

Carbon dioxide (CO<sub>2</sub>) Foam Dry powder

**Unsuitable extinguishing media**

For this substance/mixture no limitations of extinguishing agents are given.

**5.2 Special hazards arising from the substance or mixture**

Carbon oxides

Combustible.

Pay attention to flashback.

Vapors are heavier than air and may spread along floors.

Development of hazardous combustion gases or vapours possible in the event of fire.

Forms explosive mixtures with air at ambient temperatures.

**5.3 Advice for firefighters**

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

**5.4 Further information**

Remove container from danger zone and cool with water. Prevent fire extinguishing water from contaminating surface water or the ground water system.

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**SECTION 6: Accidental release measures****6.1 Personal precautions, protective equipment and emergency procedures**

Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition.

Evacuate the danger area, observe emergency procedures, consult an expert.

For personal protection see section 8.

**6.2 Environmental precautions**

Do not let product enter drains. Risk of explosion.

### 6.3 Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

### 6.4 Reference to other sections

For disposal see section 13.

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## SECTION 7: Handling and storage

### 7.1 Precautions for safe handling

#### Advice on safe handling

Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

#### Advice on protection against fire and explosion

Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.

#### Hygiene measures

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.  
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. Keep away from heat and sources of ignition.

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

#### Storage class

Storage class (TRGS 510): 3: Flammable liquids

### 7.3 Specific end use(s)

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

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## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

#### Ingredients with workplace control parameters

#### Derived No Effect Level (DNEL)

| Application Area | Routes of exposure | Health effect              | Value                 |
|------------------|--------------------|----------------------------|-----------------------|
| Workers          | Skin contact       | Long-term systemic effects | 25mg/kg BW/d          |
| Consumers        | Skin contact       | Long-term systemic effects | 15mg/kg BW/d          |
| Workers          | Inhalation         | Long-term local effects    | 150 mg/m <sup>3</sup> |
| Workers          | Inhalation         | Long-term systemic effects | 150 mg/m <sup>3</sup> |
| Consumers        | Inhalation         | Long-term systemic effects | 62 mg/m <sup>3</sup>  |
| Consumers        | Inhalation         | Acute local effects        | 150 mg/m <sup>3</sup> |

|           |            |                        |                       |
|-----------|------------|------------------------|-----------------------|
| Consumers | Inhalation | Acute systemic effects | 150 mg/m <sup>3</sup> |
|-----------|------------|------------------------|-----------------------|

#### **Predicted No Effect Concentration (PNEC)**

| Compartment                   | Value      |
|-------------------------------|------------|
| Soil                          | 2,13 mg/kg |
| Sea water                     | 0,432 mg/l |
| Fresh water                   | 4,32 mg/l  |
| Sea sediment                  | 2,33 mg/kg |
| Fresh water sediment          | 23,3 mg/kg |
| Onsite sewage treatment plant | 4,6 mg/l   |

## **8.2 Exposure controls**

### **Personal protective equipment**

#### **Eye/face protection**

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

#### **Skin protection**

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: [www.kcl.de](http://www.kcl.de)).

Splash contact

Material: butyl-rubber

Minimum layer thickness: 0,7 mm

Break through time: 10 min

Material tested: Butoject® (KCL 898)

#### **Body Protection**

Flame retardant antistatic protective clothing.

#### **Respiratory protection**

Recommended Filter type: Filter A (acc. to DIN 3181) for vapours of organic compounds

The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

#### **Control of environmental exposure**

Do not let product enter drains. Risk of explosion.

## **SECTION 9: Physical and chemical properties**

### **9.1 Information on basic physical and chemical properties**

- |                   |                   |
|-------------------|-------------------|
| a) Physical state | liquid            |
| b) Color          | No data available |
| c) Odor           | No data available |

- |                                                 |                                                                                                          |
|-------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| d) Melting point/freezing point                 | Melting point: -108,44 °C - (ECHA)                                                                       |
| e) Initial boiling point and boiling range      | 65 °C at 1.013,25 hPa - (ECHA)                                                                           |
| f) Flammability (solid, gas)                    | No data available                                                                                        |
| g) Upper/lower flammability or explosive limits | Upper explosion limit: 12,4 %(V) - (THF)<br>Lower explosion limit: 1,5 %(V)                              |
| h) Flash point                                  | -21,2 °C - closed cup - DIN 51755 Part 1                                                                 |
| i) Autoignition temperature                     | 215 °C<br>at 1.013 hPa - DIN 51794                                                                       |
| j) Decomposition temperature                    | No data available                                                                                        |
| k) pH                                           | ca.7 - 8                                                                                                 |
| l) Viscosity                                    | Viscosity, kinematic: No data available<br>Viscosity, dynamic: 0,359 mPa.s at 50 °C 0,456 mPa.s at 25 °C |
| m) Water solubility                             | miscible                                                                                                 |
| n) Partition coefficient: n-octanol/water       | log Pow: 0,45 at 25 °C - Bioaccumulation is not expected.                                                |
| o) Vapor pressure                               | 170 hPa at 20 °C - (THF)                                                                                 |
| p) Density                                      | 0,89 g/cm <sup>3</sup> at 20 °C                                                                          |
| Relative density                                | No data available                                                                                        |
| q) Relative vapor density                       | No data available                                                                                        |
| r) Particle characteristics                     | No data available                                                                                        |
| s) Explosive properties                         | No data available                                                                                        |
| t) Oxidizing properties                         | none                                                                                                     |

## 9.2 Other safety information

No data available

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## SECTION 10: Stability and reactivity

### 10.1 Reactivity

Formation of peroxides possible.  
Vapors may form explosive mixture with air.

### 10.2 Chemical stability

Sensitivity to light  
Sensitive to air.  
The product is chemically stable under standard ambient conditions (room temperature) .

Contains the following stabilizer(s):  
butyl hydroxytoluene (BHT) (250 ppm)

### 10.3 Possibility of hazardous reactions

A risk of explosion and/or of toxic gas formation exists with the following substances:

alkali hydroxides  
Bromine  
hydrides  
Potassium  
lithium aluminium hydride  
thionyl chloride  
Oxidizing agents  
Oxygen  
aminophenol  
with  
Peroxides  
Exothermic reaction with:  
Acids  
halides  
peroxi compounds

### 10.4 Conditions to avoid

Distillation (Risk of explosion).  
Warming.  
Moisture.

### 10.5 Incompatible materials

No data available

### 10.6 Hazardous decomposition products

Peroxides  
In the event of fire: see section 5

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## SECTION 11: Toxicological information

### 11.1 Information on toxicological effects

#### Acute toxicity

Acute toxicity estimate Oral - 1.650 mg/kg  
(Calculation method)

LD50 Oral - Rat - male and female - 1.650 mg/kg

Remarks: (ECHA)

Symptoms: Irritation of mucous membranes

Acute toxicity estimate Oral - 1.650 mg/kg  
(ATE value derived from LD50/LC50 value)

LC50 Inhalation - Rat - male and female - 6 h - > 14,7 mg/l - vapor



(US-EPA)

LD50 Dermal - Rat - male and female - > 2.000 mg/kg

(OECD Test Guideline 402)

### **Skin corrosion/irritation**

Skin - Rabbit

Result: No skin irritation - 72 h

(Draize Test)

Remarks: 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: Causes serious eye irritation.

Remarks: (IUCLID)

Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

### **Respiratory or skin sensitization**

Local lymph node assay (LLNA) - Mouse

Result: negative

(OECD Test Guideline 429)

### **Germ cell mutagenicity**

Test Type: Ames test

Test system: *S. typhimurium*

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 471

Result: negative

Test Type: In vitro mammalian cell gene mutation test

Test system: Chinese hamster ovary cells

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 476

Result: negative

Test Type: Chromosome aberration test in vitro

Test system: Chinese hamster ovary cells

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 473

Result: negative

Test Type: Micronucleus test

Species: Mouse

Cell type: Red blood cells (erythrocytes)

Application Route: inhalation (vapor)

Method: OECD Test Guideline 474

Result: negative

### **Carcinogenicity**

Suspected of causing cancer.

### **Reproductive toxicity**

No data available

### **Specific target organ toxicity - single exposure**

Inhalation - May cause respiratory irritation. - Central nervous system

Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

May cause drowsiness or dizziness.

**Specific target organ toxicity - repeated exposure**

No data available

**Aspiration hazard**

No data available

**11.2 Additional Information**

**Endocrine disrupting properties**

**Product:**

Assessment

The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Repeated dose toxicity - Rat - male and female - Oral - 4 Weeks

RTECS: LU5950000

irritant effects, Cough, Shortness of breath, narcosis, somnolence

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

In high doses:

somnolence

narcosis

Other dangerous properties can not be excluded.

This substance should be handled with particular care.

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**SECTION 12: Ecological information**

**12.1 Toxicity**

|                                                     |                                                                                                                |
|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Toxicity to fish                                    | flow-through test LC50 - Pimephales promelas (fathead minnow) - 2.160 mg/l - 96 h<br>(OECD Test Guideline 203) |
| Toxicity to daphnia and other aquatic invertebrates | static test EC50 - Daphnia magna (Water flea) - 3.485 mg/l - 48 h<br>(OECD Test Guideline 202)                 |
| Toxicity to fish(Chronic toxicity)                  | flow-through test NOEC - Pimephales promelas (fathead minnow) - 216 mg/l - 33 d<br>Remarks: (ECHA)             |

**12.2 Persistence and degradability**

Biodegradability aerobic Biochemical oxygen demand - Exposure time 28 d  
Result: 39 % - Not readily biodegradable.  
(OECD Test Guideline 301D)

### 12.3 Bioaccumulative potential

No data available

### 12.4 Mobility in soil

No data available

### 12.5 Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

### 12.6 Endocrine disrupting properties

#### Product:

Assessment : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

### 12.7 Other adverse effects

No data available

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## SECTION 13: Disposal considerations

### 13.1 Waste treatment methods

No data available

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## SECTION 14: Transport information

### 14.1 UN number

ADR/RID: 2056

IMDG: 2056

IATA: 2056

### 14.2 UN proper shipping name

ADR/RID: TETRAHYDROFURAN

IMDG: TETRAHYDROFURAN

IATA: Tetrahydrofuran

### 14.3 Transport hazard class(es)

ADR/RID: 3

IMDG: 3

IATA: 3

### 14.4 Packaging group

ADR/RID: II

IMDG: II

IATA: II

### 14.5 Environmental hazards

ADR/RID: no

IMDG Marine pollutant: no

IATA: no

#### 14.6 Special precautions for user

Tunnel restriction code : (D/E)

Further information : No data available

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### SECTION 15: Regulatory information

#### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.

##### Authorisations and/or restrictions on use

##### National legislation

Seveso III: Directive 2012/18/EU of the P5c FLAMMABLE LIQUIDS  
European Parliament and of the Council  
on the control of major-accident hazards  
involving dangerous substances.

##### Other regulations

Observe work restrictions regarding maternity protection in accordance to Dir 92/85/EEC or stricter national regulations where applicable.

Take note of Dir 94/33/EC on the protection of young people at work.

#### 15.2 Chemical Safety Assessment

A Chemical Safety Assessment has been carried out for this substance.

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### SECTION 16: Other information

#### Full text of H-Statements

|        |                                    |
|--------|------------------------------------|
| H225   | Highly flammable liquid and vapor. |
| H302   | Harmful if swallowed.              |
| H319   | Causes serious eye irritation.     |
| H335   | May cause respiratory irritation.  |
| H336   | May cause drowsiness or dizziness. |
| H351   | Suspected of causing cancer.       |
| EUH019 | May form explosive peroxides.      |

## Full text of other abbreviations

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

## Further information

The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is applicable to appropriate safety precautions for the product. 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](http://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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# CHEMIKART