

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Version 7.0

Revision Date 07.03.2021

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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 for analysis EMSURE®
ACS, Reag. Ph Eur

Product Number : 1.09731
Catalogue No. : 109731
Brand : Millipore
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 : Reagent for analysis

1.3 Details of the supplier of the safety data sheet

Company : Merck KGaA
Frankfurter Str. 250
D-64271 DARMSTADT

Telephone : +49 (0)6151 72-0
Fax : +49 6151 727780
E-mail address : TechnicalService@merckgroup.com

1.4 Emergency telephone

Emergency Phone # : +(44)-870-8200418 (CHEMTREC (GB))
+(353)-19014670 (CHEMTREC Ireland)
001-803-017-9114 (CHEMTREC India)

SECTION 2: Hazards identification**2.1 Classification of the substance or mixture****Classification according to Regulation (EC) No 1272/2008**

Flammable liquids (Category 2), H225

Acute toxicity, Oral (Category 4), H302

Eye irritation (Category 2), H319

Carcinogenicity (Category 2), H351

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

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

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



2.2 Label elements

Labelling according Regulation (EC) No 1272/2008

Pictogram



Signal word

Danger

Hazard statement(s)

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 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, hot surfaces, sparks, open flames and other ignition sources. No smoking.

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 statement(s)

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.

P308 + P313

IF exposed or concerned: Get medical advice/ attention.

Supplemental Hazard information (EU)

EUH019

May form explosive peroxides.

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.

SECTION 3: Composition/information on ingredients

3.1 Substances

Millipore- 1.09731

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The life science business of Merck operates as MilliporeSigma in the US and Canada



Formula : C4H8O
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
Tetrahydrofuran		
CAS-No. 109-99-9 EC-No. 203-726-8 Index-No. 603-025-00-0	Flam. Liq. 2; Acute Tox. 4; Eye Irrit. 2; Carc. 2; STOT SE 3; H225, H302, H319, H351, H336, H335 Concentration limits: >= 25 %: Eye Irrit. 2, H319; >= 25 %: STOT SE 3, H335;	<= 100 %

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

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

Carbon dioxide (CO2) 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.

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.

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. Protected from light. Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition.

Recommended storage temperature see product label.



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

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 EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: 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) Appearance | Form: liquid
Color: colorless |
| b) Odor | ether-like |
| c) Odor Threshold | No data available |
| d) pH | ca.7 |
| e) Melting point/freezing point | Melting point: -108,44 °C at 1.013,25 hPa - (ECHA) |



- | | |
|---|---|
| f) Initial boiling point and boiling range | 65 °C at 1.013 hPa |
| g) Flash point | -21,2 °C - closed cup - DIN 51755 Part 1 |
| h) Evaporation rate | No data available |
| i) Flammability (solid, gas) | No data available |
| j) Upper/lower flammability or explosive limits | Upper explosion limit: 11,8 %(V) - (THF)
Lower explosion limit: 1,8 %(V) - (THF) |
| k) Vapor pressure | 170 hPa at 20,0 °C |
| l) Vapor density | ca.2,5 at 25 °C - (Air = 1.0) |
| m) Relative density | No data available |
| n) Water solubility | miscible |
| o) Partition coefficient: n-octanol/water | log Pow: 0,45 at 25 °C - Bioaccumulation is not expected. |
| p) Autoignition temperature | 215 °C
at 1.013 hPa - DIN 51794 |
| q) Decomposition temperature | No data available |
| r) Viscosity | Viscosity, kinematic: 0,518 mm ² /s at 25 °C

Viscosity, dynamic: 0,456 mPa.s at 25 °C, 0,359 mPa.s at 50 °C |
| s) Explosive properties | No data available |
| t) Oxidizing properties | No data available |

9.2 Other safety information

- | | |
|------------------------|-------------------------------|
| Surface tension | 26,4 mN/m at 25 °C |
| Relative vapor density | ca.2,5 at 25 °C - (Air = 1.0) |

SECTION 10: Stability and reactivity

10.1 Reactivity

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

10.2 Chemical stability

The product is chemically stable under standard ambient conditions (room temperature) .
Contains the following stabilizer(s):
butyl hydroxytoluene (BHT) (<0,0250,0249 %)

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

Heat, flames and sparks.
Warming.
Moisture.

10.5 Incompatible materials

rubber, various plastics, Tin

10.6 Hazardous decomposition products

Peroxides
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Acute toxicity estimate Oral - 1.651 mg/kg
(Calculation method)

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

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)

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.

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

11.2 Additional Information

Repeated dose toxicity - Rat - male and female - Oral - 28 dRemarks:
(ECHA)

Not available

Central nervous system depression, Cough, chest pain, Difficulty in breathing, Exposure to high airborne concentrations can cause anesthetic effects.

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.



SECTION 12: Ecological information

12.1 Toxicity

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)

12.2 Persistence and degradability

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

No bioaccumulation is to be expected ($\log Pow \leq 4$).

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 Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

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

No data available

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.

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, preparations and articles (Annex XVII)

National legislation

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

: FLAMMABLE LIQUIDS

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.

SECTION 16: Other information

Full text of H-Statements referred to under sections 2 and 3.

EUH019	May form explosive peroxides.
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.

Relevant changes since previous version

2. Hazards identification



Further information

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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