SAFETY DATA SHEET

Version 6.13
Revision Date 03/02/2024
Print Date 05/05/2024

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

1.1 Product identifiers

Product name : Ethyl Alcohol, pure

Product Number : 459836
Brand : Sigma-Aldrich
Index-No. : 603-002-00-5
CAS-No. : 64-17-5

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

Identified uses : Laboratory chemicals, Synthesis of substances

Uses advised against : The product is being supplied under the TSCA R&D Exemption (40 CFR Section 720.36). It is the recipient's responsibility to comply with the requirements of the R&D exemption. The product may not be used for a non-exempt commercial purpose under TSCA unless appropriate consent is granted in writing by MilliporeSigma.

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +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
Eye irritation (Category 2A), H319

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

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2.2 GHS Label elements, including precautionary statements

Pictogram

Signal Word Danger

Hazard Statements

H225	Highly flammable liquid and vapor.
H319	Causes serious eye irritation.

Precautionary Statements

P210	Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
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.
P264	Wash skin thoroughly after handling.
P280	Wear protective gloves/ eye protection/ face protection.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P235	Store in a well-ventilated place. Keep cool.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Synonyms : Absolute alcohol

Formula : C_2H_6O
Molecular weight : 46.07 g/mol
CAS-No. : 64-17-5
EC-No. : 200-578-6
Index-No. : 603-002-00-5

Component	Classification	Concentration
ethanol		
	Flam. Liq. 2; Eye Irrit. 2A; H225, H319 Concentration limits: >= 50 %: Eye Irrit. 2A,	<= 100 %

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	H319;	

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.

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

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
Water Foam Carbon dioxide (CO2) 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

In the event of fire, wear self-contained breathing apparatus.

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

Hygiene measures
Change contaminated clothing. Wash hands 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.

Hygroscopic.

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

Component	CAS-No.	Value	Control parameters	Basis
ethanol	64-17-5	TWA	1,000 ppm 1,900 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		STEL	1,000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Confirmed animal carcinogen with unknown relevance to humans		
		TWA	1,000 ppm 1,900 mg/m3	USA. NIOSH Recommended Exposure Limits
		PEL	1,000 ppm 1,900 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Derived No Effect Level (DNEL)

Application Area	Routes of exposure	Health effect	Value
Workers	Inhalation	Long-term systemic effects	950 mg/m3
Workers	Skin contact	Long-term systemic effects	343mg/kg BW/d
Workers	Ingestion	Long-term systemic effects	343mg/kg BW/d
Workers	Inhalation	Acute local effects	1900 mg/m3

Predicted No Effect Concentration (PNEC)

Compartment	Value
Soil	0.63 mg/kg
Sea water	0.79 mg/l
Fresh water	0.96 mg/l
Fresh water sediment	3.6 mg/l
Sewage treatment plant	580 mg/l

8.2 Exposure controls

Appropriate engineering controls
Change contaminated clothing. Wash hands after working with substance.

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

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contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Full contact
Material: butyl-rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Butoject® (KCL 898)

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).
Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.4 mm
Break through time: 120 min
Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

Body Protection
Flame retardant antistatic protective clothing.

Respiratory protection
Recommended Filter type: Filter A (acc. to DIN 3181) for vapours of organic compounds
The entrepeneur 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.
required when vapours/aerosols are generated. Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

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	alcohol-like
c)	Odor Threshold	0.1 ppm
d)	pH	7.0 at 10 g/l at 20 °C (68 °F)
e)	Melting point/freezing point	Melting point/range: -114 °C (-173 °F)
f)	Initial boiling point and boiling range	78 °C 172 °F
g)	Flash point	13 °C (55 °F) - closed cup

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h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 27.7 %(V) Lower explosion limit: 3.1 %(V)
k)	Vapor pressure	57.26 hPa at 19.6 °C (67.3 °F)
l)	Vapor density	1.6
m)	Density	0.789 g/mL at 25 °C (77 °F)
	Relative density	No data available
n)	Water solubility	1,000 g/l at 20 °C (68 °F) - completely miscible
o)	Partition coefficient: n-octanol/water	log Pow: -0.35 at 24 °C (75 °F) - Bioaccumulation is not expected.
p)	Autoignition temperature	363 - 425 °C (685 - 797 °F) at 1,013 hPa
q)	Decomposition temperature	Distillable in an undecomposed state at normal pressure.
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	none

9.2 Other safety information

Conductivity	< 1 µS/cm
Surface tension	22.31 mN/m at 20 °C (68 °F) - similar to water
Relative vapor density	1.6

SECTION 10: Stability and reactivity

10.1 Reactivity

Vapors may form explosive mixture with air.

10.2 Chemical stability

The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions

Risk of explosion/exothermic reaction with:
hydrogen peroxide
perchlorates
perchloric acid
Nitric acid
mercury(II) nitrate
permanganic acid

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Nitriles
peroxi compounds
Strong oxidizing agents
nitrosyl compounds
Peroxides
sodium
Potassium
halogen oxides
calcium hypochlorite
nitrogen dioxide
metallic oxides
uranium hexafluoride
iodides
Chlorine
Alkali metals
Alkaline earth metals
alkali oxides
Ethylene oxide
silver
with
Nitric acid
silver compounds
with
Ammonia
potassium permanganate
with
conc. sulfuric acid
Risk of ignition or formation of inflammable gases or vapours with:
halogen-halogen compounds
chromium(VI) oxide
chromyl chloride
Fluorine
hydrides
Oxides of phosphorus
platinum
Nitric acid
with
potassium permanganate

10.4 Conditions to avoid

Warming.
Warming.

10.5 Incompatible materials

No data available

10.6 Hazardous decomposition products

In the event of fire: see section 5

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SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - male and female - 10,470 mg/kg
(OECD Test Guideline 401)
LC50 Inhalation - Rat - male and female - 4 h - 124.7 mg/l - vapor

(OECD Test Guideline 403)
Dermal: No data available

Skin corrosion/irritation
Skin - Rabbit
Result: No skin irritation - 24 h
(OECD Test Guideline 404)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Causes serious eye irritation.
(OECD Test Guideline 405)

Respiratory or skin sensitization
Maximization Test - Guinea pig
Result: negative
(OECD Test Guideline 406)
Remarks: (in analogy to similar products)
The value is given in analogy to the following substances: Methanol

Germ cell mutagenicity
Test Type: Ames test
Test system: Salmonella 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: mouse lymphoma cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

Test Type: dominant lethal test
Species: Mouse

Application Route: Oral
Method: OECD Test Guideline 478
Result: Positive results were obtained in some in vivo tests.

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.

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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

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

11.2 Additional Information

Repeated dose toxicity - Rat - male - Oral - NOAEL (No observed adverse effect level) - 1,730 mg/kg - LOAEL (Lowest observed adverse effect level) - 3,200 mg/kg

RTECS: KQ6300000
irritant effects, respiratory paralysis, Dizziness, narcosis, inebriation, euphoria, Nausea, Vomiting
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish	flow-through test LC50 - Pimephales promelas (fathead minnow) - 15,300 mg/l - 96 h (US-EPA)
Toxicity to daphnia and other aquatic invertebrates	static test LC50 - Ceriodaphnia dubia (water flea) - 5,012 mg/l - 48 h Remarks: (ECHA)
Toxicity to algae	static test ErC50 - Chlorella vulgaris (Fresh water algae) - 275 mg/l - 72 h (OECD Test Guideline 201)
Toxicity to bacteria	static test IC50 - activated sludge - > 1,000 mg/l - 3 h (OECD Test Guideline 209)
Toxicity to fish(Chronic toxicity)	semi-static test NOEC - Danio rerio (zebra fish) - 250 mg/l - 120 h Remarks: (ECHA)
Toxicity to daphnia	semi-static test NOEC - Daphnia magna (Water flea) - 9.6 mg/l - 9 d

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and other aquatic invertebrates(Chronic toxicity)	Remarks: (ECHA)

12.2 Persistence and degradability

Biodegradability	aerobic - Exposure time 15 d Result: ca.95 % - Readily biodegradable. (OECD Test Guideline 301E)
Biochemical Oxygen Demand (BOD)	930 - 1,670 mg/g Remarks: (Lit.)
Theoretical oxygen demand	2,100 mg/g Remarks: (Lit.)

12.3 Bioaccumulative potential

Due to the distribution coefficient n-octanol/water, accumulation in organisms is not expected.

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

12.6 Endocrine disrupting properties

No data available

12.7 Other adverse effects

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

SECTION 14: Transport information

DOT (US)

UN number: 1170 Class: 3 Packing group: II
Proper shipping name: Ethanol
Reportable Quantity (RQ):
Poison Inhalation Hazard: No

IMDG

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UN number: 1170 Class: 3 Packing group: II EMS-No: F-E, S-D
Proper shipping name: ETHANOL

IATA
UN number: 1170 Class: 3 Packing group: II
Proper shipping name: Ethanol

SECTION 15: Regulatory information

SARA 302 Components
This material does not contain any components with a section 302 EHS TPQ.

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, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
ethanol	64-17-5	

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
ethanol	64-17-5	

California Prop. 65 Components

	CAS-No.	Revision Date
, which is/are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.ethanol	64-17-5	

SECTION 16: Other information

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 and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.
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information in the document regarding the product remains unchanged and matches the product ordered. For further information please contact mlsbranding@sial.com.
Version: 6.13 Revision Date: 03/02/2024 Print Date: 05/05/2024

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