

SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Revision Date 09/14/2018

Version 1.2

SECTION 1. Identification**Product identifier**

Product number	EX0190
Product name	Ethyl Ether Anhydrous GR ACS
CAS-No.	60-29-7

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

Identified uses	Reagent for analysis
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Details of the supplier of the safety data sheet

Company	EMD Millipore Corporation 400 Summit Drive Burlington Massachusetts 01803 United States of America General Inquiries: +1 800-645-5476 Monday to Friday, 9:00 AM to 4:00 PM Eastern Time (GMT-5) MilliporeSigma is a business of Merck KGaA, Darmstadt, Germany.
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Emergency telephone	800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week
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SECTION 2. Hazards identification**GHS Classification**

Flammable liquid, Category 1, H224
Acute toxicity, Category 4, Oral, H302
Specific target organ systemic toxicity - single exposure, Category 3, Central nervous system, H336
For the full text of the H-Statements mentioned in this Section, see Section 16.

GHS-Labeling*Hazard pictograms**Signal Word*

Danger

Hazard Statements

H224 Extremely flammable liquid and vapor.
H302 Harmful if swallowed.
H336 May cause drowsiness or dizziness.

SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number

EX0190

Version 1.2

Product name

Ethyl Ether Anhydrous GR ACS

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.

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 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.

P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing.

Rinse skin with water/ shower.

P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P312 Call a POISON CENTER/doctor if you feel unwell.

P330 Rinse mouth.

P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.

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.

Other hazards

None known.

SECTION 3. Composition/information on ingredients

Formula $C_4H_{10}O$ (Hill)

Molar mass 74.12 g/mol

Hazardous ingredients

Chemical name (Concentration)

CAS-No.

Diethyl ether (>= 90 % - <= 100 %)

60-29-7

Exact percentages are being withheld as a trade secret.

SECTION 4. First aid measures

Description of first-aid measures

Inhalation

After inhalation: fresh air. Call in physician.

Skin contact

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

SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number

EX0190

Version 1.2

Product name

Ethyl Ether Anhydrous GR ACS

Eye contact

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

Ingestion

After swallowing: caution if victim vomits. Risk of aspiration! Keep airways free. Pulmonary failure possible after aspiration of vomit. Call a physician immediately.

Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed

irritant effects, respiratory paralysis, Unconsciousness, inebriation, euphoria, collapse, somnolence, ataxia (impaired locomotor coordination), Salivation, Coma, death
somnolence, Drowsiness, Repeated exposure may cause skin dryness or cracking.

Indication of any immediate medical attention and special treatment needed

No information available.

SECTION 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

Foam, Carbon dioxide (CO₂), Dry powder

Unsuitable extinguishing media

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

Special hazards arising from the substance or mixture

Combustible.

Pay attention to flashback.

Vapors are heavier than air and may spread along floors.

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

Forms explosive mixtures with air at ambient temperatures.

Advice for firefighters

Special protective equipment for fire-fighters

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

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

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.

Advice for emergency responders:

Protective equipment see section 8.

Environmental precautions

Do not let product enter drains. Risk of explosion.

SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number

EX0190

Version 1.2

Product name

Ethyl Ether Anhydrous GR ACS

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.

SECTION 7. Handling and storage

Precautions for safe handling

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

Observe label precautions.

Advice on protection against fire and explosion

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

Conditions for safe storage, including any incompatibilities

Protected from light.

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

Store at +2°C to +25°C (+36°F to +77°F).

SECTION 8. Exposure controls/personal protection

Exposure limit(s)

Ingredients

Basis	Value	Threshold limits	Remarks
<i>Diethyl ether 60-29-7</i>			
ACGIH	Time Weighted Average (TWA):	400 ppm	
	Short Term Exposure Limit (STEL):	500 ppm	
OSHA_TRANS	PEL:	400 ppm 1,200 mg/m ³	
	Z1A	Time Weighted Average (TWA):	400 ppm 1,200 mg/m ³
	Short Term Exposure Limit (STEL):	500 ppm 1,500 mg/m ³	

Engineering measures

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

Individual protection measures

Protective clothing should be selected specifically for the workplace, depending on concentration and quantity of the hazardous substances handled. The chemical resistance of the protective equipment should be inquired at the respective supplier.

Hygiene measures

Change contaminated clothing. Application of skin- protective barrier cream recommended. Wash hands after working with substance.

SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number

EX0190

Version 1.2

Product name

Ethyl Ether Anhydrous GR ACS

Eye/face protection

Safety glasses

Hand protection

splash contact:

Glove material:	Viton (R)
Glove thickness:	0.70 mm
Break through time:	> 30 min

The protective gloves to be used must comply with the specifications of EC Directive 89/686/EEC and the related standard EN374, for example KCL 890 Vitoject® (splash contact).

The breakthrough times stated above were determined by KCL in laboratory tests acc. to EN374 with samples of the recommended glove types.

This recommendation applies only to the product stated in the safety data sheet and supplied by us as well as to the purpose specified by us. 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).

Other protective equipment:

Flame retardant antistatic protective clothing.

Respiratory protection

required when vapors/aerosols are generated.

Recommended Filter type: Filter AX (EN 371)

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

SECTION 9. Physical and chemical properties

Physical state	liquid
Color	colorless
Odor	characteristic
Odor Threshold	0.3 - 8.8 ppm
pH	No information available.
Melting point	-177.3 °F (-116.3 °C)
Boiling point/boiling range	94.3 °F (34.6 °C) at 1,013 hPa
Flash point	-40 °F (-40 °C) Method: c.c.
Evaporation rate	No information available.
Flammability (solid, gas)	No information available.

SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number

EX0190

Version 1.2

Product name

Ethyl Ether Anhydrous GR ACS

Lower explosion limit	1.7 %(V)
Upper explosion limit	36 %(V)
Vapor pressure	587 hPa at 68 °F (20 °C)
Relative vapor density	No information available.
Density	0.71 g/cm ³
Relative density	No information available.
Water solubility	69 g/l at 68 °F (20 °C)
Partition coefficient: n-octanol/water	log Pow: 0.89 (experimental) (Lit.) Bioaccumulation is not expected.
Autoignition temperature	No information available.
Decomposition temperature	No information available.
Viscosity, dynamic	0.23 mPa.s at 68 °F (20 °C)
Explosive properties	Not classified as explosive.
Oxidizing properties	none
Ignition temperature	356 °F (180 °C) Method: DIN 51794

SECTION 10. Stability and reactivity

Reactivity

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

Chemical stability

Sensitivity to light
Sensitive to air.

Possibility of hazardous reactions

Risk of ignition or formation of inflammable gases or vapors with:
chromyl chloride, Peroxides
Risk of explosion with:

SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number

EX0190

Version 1.2

Product name

Ethyl Ether Anhydrous GR ACS

azides, halogens, halogen-halogen compounds, nonmetallic oxyhalides, Strong oxidizing agents, chromium(VI) oxide, halogen oxides, peroxi compounds, perchloric acid, perchlorates, Nitric acid, nitrating acid, Oxygen, Ozone, turpentine oils and/or turpentine substitutes, nitrates, metallic chlorides, salts of oxyhalogenic acids, nitrogen oxides, nonmetallic oxides, chromosulfuric acid, chlorates, hydrogen peroxide, permanganic acid

sulfuric acid, with, Nitric acid

sulfur, Risk of explosion during distillation.

Exothermic reaction with:

acid halides

Conditions to avoid

Warming.

Incompatible materials

rubber, various plastics

Hazardous decomposition products

Peroxides

SECTION 11. Toxicological information

Information on toxicological effects

Likely route of exposure

Inhalation, Eye contact, Skin contact, Ingestion

Target Organs

Eyes

Skin

Respiratory system

Central nervous system

Acute oral toxicity

LD50 Rat: 1,215 mg/kg (RTECS)

Symptoms: Risk of aspiration upon vomiting., Aspiration may cause pulmonary edema and pneumonitis.

Acute inhalation toxicity

Symptoms: mucosal irritations

Acute dermal toxicity

LD50 Rabbit: > 2,000 mg/kg
(ECHA)

Skin irritation

Rabbit

Result: No irritation

OECD Test Guideline 404

Dermatitis

Repeated exposure may cause skin dryness or cracking.

SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number

EX0190

Version 1.2

Product name

Ethyl Ether Anhydrous GR ACS

Eye irritation

Rabbit

Result: No eye irritation

OECD Test Guideline 405

Sensitization

Sensitization test: Mouse

Result: negative

Method: OECD Test Guideline 429

Human experience

Result: negative

(Lit.)

Genotoxicity in vivo

Mouse

Result: negative

Method: OECD Test Guideline 474

Genotoxicity in vitro

Ames test

Salmonella typhimurium

Result: negative

(IUCLID)

Mutagenicity (mammal cell test): chromosome aberration.

Human lymphocytes

Result: negative

Method: OECD Test Guideline 405

Mutagenicity (mammal cell test):

MOUSE LYMPHOMA TEST

Result: negative

Method: OECD Test Guideline 476

Carcinogenicity

Carcinogen classifications of IARC, NTP, California proposition 65 for Ethanol CAS 64-17-5 apply to beverage use only. This product is NOT intended for this use.

Specific target organ systemic toxicity - single exposure

May cause drowsiness or dizziness.

Target Organs: Central nervous system

Specific target organ systemic toxicity - repeated exposure

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

Aspiration hazard

Regarding the available data the classification criteria are not fulfilled.

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.

SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number
Product name

EX0190
Ethyl Ether Anhydrous GR ACS

Version 1.2

OSHA	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.
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.
ACGIH	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

Further information

Narcotic!

After absorption:

Salivation, euphoria, ataxia (impaired locomotor coordination), inebriation, collapse, Unconsciousness, Coma

Cannot be excluded:

respiratory paralysis, death

Other dangerous properties can not be excluded.

Handle in accordance with good industrial hygiene and safety practice.

SECTION 12. Ecological information

Ecotoxicity

Toxicity to fish

LC50 *Leuciscus idus* (Golden orfe): 2,840 mg/l; 48 h (ECOTOX Database)

Toxicity to daphnia and other aquatic invertebrates

EC50 *Daphnia magna* (Water flea): 1,380 mg/l; 48 h (IUCLID)

Toxicity to algae

static test EC50 *Desmodesmus subspicatus* (green algae): > 100 mg/l; 72 h
OECD Test Guideline 201

Toxicity to bacteria

static test EC50 activated sludge: 21,000 mg/l; 3 h
OECD Test Guideline 209

static test NOEC activated sludge: 42 mg/l; 3 h
OECD Test Guideline 209

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

semi-static test NOEC *Daphnia magna* (Water flea): > 100 mg/l; 21 d

OECD Test Guideline 211

Persistence and degradability

Biodegradability

Not readily biodegradable.

Bioaccumulative potential

Partition coefficient: n-octanol/water

log Pow: 0.89

(experimental)

(Lit.) Bioaccumulation is not expected.

SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number EX0190
Product name Ethyl Ether Anhydrous GR ACS

Version 1.2

Mobility in soil

No information available.

Other adverse effects

Henry constant

124.6 Pa*m³/mol

Method: (experimental)

(Lit.) Distribution preferentially in air.

SECTION 13. Disposal considerations

The information presented only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. Disposal should be in accordance with applicable regional, national and local laws and regulations.

SECTION 14. Transport information

Land transport (DOT)

UN number UN 1155
Proper shipping name DIETHYL ETHER
Class 3
Packing group I
Environmentally hazardous --

Air transport (IATA)

UN number UN 1155
Proper shipping name DIETHYL ETHER
Class 3
Packing group I
Environmentally hazardous --
Special precautions for user no

Sea transport (IMDG)

UN number UN 1155
Proper shipping name DIETHYL ETHER
Class 3
Packing group I
Environmentally hazardous --
Special precautions for user yes
EmS F-E S-D

SECTION 15. Regulatory information

United States of America

SARA 313

SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number

EX0190

Version 1.2

Product name

Ethyl Ether Anhydrous GR ACS

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 302

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

Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.

This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.

DEA List I

Not listed

DEA List II

Listed

Ingredients

Diethyl ether

60-29-7

US State Regulations

Massachusetts Right To Know

Ingredients

Diethyl ether

Pennsylvania Right To Know

Ingredients

Diethyl ether

New Jersey Right To Know

Ingredients

Diethyl ether

California Prop 65 Components

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

Notification status

TSCA:

All components of the product are listed in the TSCA-inventory.

DSL:

All components of this product are on the Canadian DSL

SECTION 16. Other information

Training advice

Provide adequate information, instruction and training for operators.

SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number

EX0190

Version 1.2

Product name

Ethyl Ether Anhydrous GR ACS

Labeling

Hazard pictograms



Signal Word

Danger

Hazard Statements

H224 Extremely flammable liquid and vapor.

H302 Harmful if swallowed.

H336 May cause drowsiness or dizziness.

EUH019 May form explosive peroxides.

EUH066 Repeated exposure may cause skin dryness or cracking.

Precautionary Statements

Prevention

P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.

P240 Ground/bond container and receiving equipment.

Storage

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

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

H224 Extremely flammable liquid and vapor.

H302 Harmful if swallowed.

H336 May cause drowsiness or dizziness.

Key or legend to abbreviations and acronyms used in the safety data sheet

Used abbreviations and acronyms can be looked up at www.wikipedia.org.

Revision Date 09/14/2018

The information contained herein is based on the present state of our knowledge. It characterizes the product with regard to appropriate safety precautions. It does not represent a warranty of any product properties and we assume no liability for any loss or injury which may result from the use of this information. Users should conduct their own investigations to determine the suitability of the information.

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