SAFETY DATA SHEET

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

Revision Date 04/18/2014 Version 1. 5

SECTION 1.Identification

Product identifier

Product number	100930
Product name	Diethyl ether for spectroscopy Uvasol®
Synonyms	Et2O
CAS-No.	60-29-7

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

Identified uses	Reagent for analysis

Details of the supplier of the safety data sheet

Company	EMD Millipore Corporation | 290 Concord Road, Billerica, MA 01821, United States of America | General Inquiries: +1-978-715-4321 | Monday to Friday, 9:00 AM to 4:00 PM Eastern Time (GMT-5)

Emergency telephone	800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

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, 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.

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.
P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P403 + P235 Store in a well-ventilated place. Keep cool.

OSHA Hazards
This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200). This information is based on 29 CFR 1910.1200 criteria prior to adoption of the GHS and may deviate from the GHS information.

Other hazards
None known.

SECTION 3. Composition/information on ingredients

Formula	$(C_2H_5)_2O$	$C_4H_{10}O$ (Hill)
Synonyms	Et2O	
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.
ethanol (>= 1 % - < 5 %)
64-17-5
Exact percentages are being withheld as a trade secret.

SECTION 4. First aid measures

Description of first-aid measures
Inhalation
After inhalation: fresh air. Consult doctor if feeling unwell.

Skin contact
After skin contact: wash off with plenty of water. Remove contaminated clothing.

Eye contact
After eye contact: rinse out with plenty of water with the eyelid held wide open. Call in ophthalmologist if necessary.

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

Indication of any immediate medical attention and special treatment needed

No information available.

SECTION 5. Fire-fighting measures

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.

Special hazards arising from the substance or mixture

Combustible.
Vapors are heavier than air and may spread along floors.
Forms explosive mixtures with air at ambient temperatures.
Pay attention to flashback.
Development of hazardous combustion gases or vapors possible in the event of fire.

Advice for firefighters

Special protective equipment for fire-fighters

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

Further information

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

SECTION 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Avoid substance contact. Do not breathe vapors, aerosols. 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 empty into drains. Risk of explosion.

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 +15°C to +25°C (+59°F to +77°F).

SECTION 8. Exposure controls/personal protection

Exposure limit(s)

Ingredients

Basis	Value	Threshold limits	Remarks
Diethyl ether 60-29-7			
ACGIH	Time Weighted Average (TWA):	400 ppm	
	Short Term Exposure Limit (STEL):	500 ppm	
OSHA_TRANS	PEL:	400 ppm 1,200 mg/m³	
Z1A	Time Weighted Average (TWA):	400 ppm 1,200 mg/m³	
	Short Term Exposure Limit (STEL):	500 ppm 1,500 mg/m³	
ethanol 64-17-5			
ACGIH	Short Term Exposure Limit (STEL):	1,000 ppm	
NIOSH/GUIDE	Recommended exposure limit (REL):	1,000 ppm 1,900 mg/m³	
OSHA_TRANS	PEL:	1,000 ppm 1,900 mg/m³	
Z1A	Time Weighted Average (TWA):	1,000 ppm 1,900 mg/m³	

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
Immediately change contaminated clothing. Apply skin- protective barrier cream. Wash hands and face after working with substance.

Eye/face protection
Safety glasses

Hand protection
Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Other protective equipment:
Flame retardant antistatic protective clothing

Respiratory protection
required when vapors/aerosols are generated.
Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

SECTION 9. Physical and chemical properties

Physical state	liquid
Color	colorless
Odor	characteristic
Odor Threshold	No information available.
pH	No information available.
Melting point	-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.
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/cm³
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.

Chemical stability

Sensitivity to light
Sensitive to air.

Stabilizer
ethanol

Possibility of hazardous reactions

Risk of explosion with:

azides, halogens, halogen-halogen compounds, nonmetals, 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

Risk of ignition or formation of inflammable gases or vapors with:

chromyl chloride, Peroxides

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
Liver
Blood
reproductive system

Acute oral toxicity
LDLO human: 260 mg/kg (RTECS)

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

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

Acute inhalation toxicity
absorption
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.

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
Target Organs: Central nervous system
May cause drowsiness or dizziness.

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.
OSHA	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
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
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.

Mobility in soil

No information available.

Other adverse effects

Henry constant
124.6 Pa*m³/mol
Method: (experimental)
(Lit.) Distribution preferentially in air.

Additional ecological information
Discharge into the environment must be avoided.

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

OSHA Hazards
Flammable Liquid
Harmful if swallowed.

Target organ effects
Skin irritant
Eye irritant
Respiratory irritant
Harmful if inhaled.

This information is based on 29 CFR 1910.1200 criteria prior to adoption of the GHS, and may deviate from the GHS information on the label and in section 2.

SARA 311/312 Hazards
Fire Hazard
Acute Health Hazard
Chronic Health Hazard

SARA 313
SARA 313: 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
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
ethanol

Pennsylvania Right To Know
Ingredients
Diethyl ether
ethanol

New Jersey Right To Know
Ingredients
Diethyl ether
ethanol

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.

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 04/18/2014

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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