



SAFETY DATA SHEET

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

Date of issue: 04/03/2014

Version 1.0

SECTION 1. Identification

Product identifier

Product number	TX0280
Product name	Tetrahydrofuran Stabilized GR ACS
Synonyms	THF
CAS-No.	109-99-9

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 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)
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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 2, H225
Eye irritation, Category 2, H319
Carcinogenicity, Category 2, H351
Specific target organ systemic toxicity - single exposure, Category 3, Respiratory system, H335
For the full text of the H-Statements mentioned in this Section, see Section 16.

GHS-Labeling

Hazard pictograms



Signal Word
Danger

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Hazard Statements

H225 Highly flammable liquid and vapor.

H319 Causes serious eye irritation.

H335 May cause respiratory irritation.

H351 Suspected of causing cancer.

Precautionary Statements

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

P240 Ground/bond container and receiving equipment.

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.

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

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 ₄ H ₈ O	C ₄ H ₈ O (Hill)
Synonyms	THF	
Molar mass	72.11 g/mol	

Hazardous ingredients

Chemical Name (Concentration)

CAS-No.

tetrahydrofuran (>= 90 % - <= 100 %)

109-99-9

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 a physician.

Skin contact

After skin contact: wash off with plenty of water. Remove contaminated clothing. Consult a physician.

Eye contact

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

Ingestion

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

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Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed

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

Indication of any immediate medical attention and special treatment needed

No information available.

SECTION 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

Water, Dry powder, Foam, Carbon dioxide (CO₂)

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

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: Avoid substance contact. Do not breathe vapors, aerosols.

Keep away from heat and sources of ignition. Ensure adequate ventilation. 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. Chemisorb®). Dispose of properly. Clean up affected area.

SECTION 7. Handling and storage

Precautions for safe handling

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Observe label precautions.

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

Conditions for safe storage, including any incompatibilities

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

Store at room temperature.

SECTION 8. Exposure controls/personal protection

Exposure limit(s)

Ingredients

Basis	Value	Threshold limits	Remarks
<i>tetrahydrofuran 109-99-9</i>			
ACGIH	Time Weighted Average (TWA): Skin designation:	50 ppm	Can be absorbed through the skin.
	Short Term Exposure Limit (STEL):	100 ppm	
NIOSH/GUIDE	Recommended exposure limit (REL):	200 ppm 590 mg/m ³	
	Short Term Exposure Limit (STEL):	250 ppm 735 mg/m ³	
OSHA_TRANS	PEL:	200 ppm 590 mg/m ³	
Z1A	Short Term Exposure Limit (STEL):	250 ppm 735 mg/m ³	
	Time Weighted Average (TWA):	200 ppm 590 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

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

Eye/face protection

Safety glasses

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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	ether-like
Odor Threshold	No information available.
pH	7 - 8 at 200 g/l 68 °F (20 °C)
Melting point	-108.5 °C
Boiling point/boiling range	149 - 151 °F (65 - 66 °C) at 1,013 hPa
Flash point	-6.7 °F (-21.5 °C) Method: c.c.
Evaporation rate	No information available.
Flammability (solid, gas)	No information available.
Lower explosion limit	1.5 %(V)
Upper explosion limit	12.4 %(V)
Vapor pressure	173 hPa at 68 °F (20 °C)
Relative vapor density	2.5
Density	0.89 g/cm ³ at 68 °F (20 °C)
Relative density	No information available.

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Water solubility	at 68 °F (20 °C) soluble
Partition coefficient: n-octanol/water	log Pow: 0.45 (25 °C) OECD Test Guideline 107 Bioaccumulation is not expected.
Autoignition temperature	No information available.
Decomposition temperature	Distillable in an undecomposed state at normal pressure.
Viscosity, dynamic	0.48 mPa.s at 68 °F (20 °C)
Explosive properties	Not classified as explosive.
Oxidizing properties	none
Ignition temperature	419 °F (215 °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.

Stabilizer

butyl hydroxytoluene (BHT)

Possibility of hazardous reactions

A risk of explosion and/or of toxic gas formation exists with the following substances:
alkali hydroxides, hydrides, Oxidizing agents, Bromine, Oxygen

Conditions to avoid

Warming.

Incompatible materials

rubber, various plastics, Tin

Hazardous decomposition products

Peroxides

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SECTION 11. Toxicological information

Information on toxicological effects

Likely route of exposure

Inhalation, Eye contact, Skin contact

Target Organs

Eyes

Respiratory system

Central nervous system

Acute oral toxicity

LD50 rat: 1,650 mg/kg (RTECS) (Regulation (EC) No 1272/2008, Annex VI)

Symptoms: Irritation of mucous membranes

Acute inhalation toxicity

LC50 rat: 53.9 mg/l; 4 h (IUCLID)

Irritating to respiratory system.

Symptoms: mucosal irritations, Cough, Shortness of breath, Possible damages:, damage of respiratory tract

Acute dermal toxicity

absorption

Skin irritation

rabbit

Result: Irritations

(IUCLID) (Regulation (EC) No 1272/2008, Annex VI)

Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.

Eye irritation

rabbit

Result: Eye irritation

(IUCLID)

Causes serious eye irritation.

Sensitization

Sensitization test: guinea pig

Result: negative

(IUCLID)

Human experience

Result: negative

(IUCLID)

Genotoxicity in vitro

Ames test

Result: negative

(IUCLID)

Reproductive toxicity

No impairment of reproductive performance suspected. (Lit.)

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CMR effects

Carcinogenicity:

Suspected of causing cancer.

Specific target organ systemic toxicity - single exposure

Target Organs: Respiratory system

May cause respiratory irritation.

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

Confirmed animal carcinogen with unknown relevance to humans.

tetrahydrofuran

109-99-9

Further information

In high doses:

drowsiness, narcosis

Handle in accordance with good industrial hygiene and safety practice.

SECTION 12. Ecological information

Ecotoxicity

Toxicity to fish

LC50 Pimephales promelas (fathead minnow): 2,160 mg/l; 96 h (in soft water) (IUCLID)

Toxicity to daphnia and other aquatic invertebrates

EC50 Daphnia magna (Water flea): 382 mg/l; 24 h (IUCLID)

Toxicity to algae

IC5 Scenedesmus quadricauda (Green algae): 3,700 mg/l; 8 d (maximum permissible toxic concentration) (IUCLID)

Toxicity to bacteria

EC5 Pseudomonas putida: 580 mg/l; 16 h (maximum permissible toxic concentration) (IUCLID)

Persistence and degradability

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Biodegradability

39 %; 28 d

OECD Test Guideline 301D

Not readily biodegradable.

Bioaccumulative potential

Partition coefficient: n-octanol/water

log Pow: 0.45 (25 °C)

OECD Test Guideline 107

Bioaccumulation is not expected.

Mobility in soil

No information available.

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 2056
Proper shipping name	TETRAHYDROFURAN
Class	3
Packing group	II
Environmentally hazardous	--

Air transport (IATA)

UN number	UN 2056
Proper shipping name	TETRAHYDROFURAN
Class	3
Packing group	II
Environmentally hazardous	--
Special precautions for user	no

Sea transport (IMDG)

UN number	UN 2056
Proper shipping name	TETRAHYDROFURAN
Class	3
Packing group	II
Environmentally hazardous	--
Special precautions for user	yes

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EmS

F-E S-D

SECTION 15. Regulatory information

United States of America

OSHA Hazards

Flammable Liquid
Eye irritant
Respiratory irritant
Skin irritant
Target organ effects

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

Not listed

US State Regulations

Massachusetts Right To Know

Ingredients
tetrahydrofuran

Pennsylvania Right To Know

Ingredients
tetrahydrofuran

New Jersey Right To Know

Ingredients
tetrahydrofuran

California Prop 65 Components

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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.

H225	Highly flammable liquid and vapor.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H351	Suspected of causing cancer.

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.

Date of issue: 04/03/2014

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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