

Safety Data Sheet

acc. to OSHA HCS

Printing date 02/28/2022

Reviewed on 02/28/2022

1 Identification

- **Product identifier**
- **Trade name:** Tetrahydrofuran (Stabilized), Reagent ACS
- **Article number:** T5110
- **CAS Number:**
109-99-9
- **EC number:**
203-726-8
- **Index number:**
603-025-00-0
- **Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**
Aqua Solutions, Inc.
6913 Highway 225
DEER PARK, TX 77536
USA
800-256-2586
- **Information department:**
Technical Coordinator
Sherman Nelson shermann@aquasolutions.org
- **Emergency telephone number:**
Chemtrec: 800-424-9300
Canutec: 613-996-6666



2 Hazard(s) identification

- **Classification of the substance or mixture**



GHS02 Flame

Flammable Liquids 2

H225 Highly flammable liquid and vapor.



GHS08 Health hazard

Carcinogenicity 2

H351 Suspected of causing cancer.



GHS07

Eye Irritation 2A

H319 Causes serious eye irritation.

Specific Target Organ Toxicity - Single Exposure 3 H335 May cause respiratory irritation.

- **Label elements**

- **GHS label elements** The substance is classified and labeled according to the Globally Harmonized System (GHS).

- **Hazard pictograms**



GHS02



GHS07



GHS08

- **Signal word** *Danger*

(Contd. on page 2)

Safety Data Sheet

acc. to OSHA HCS

Printing date 02/28/2022

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Trade name: Tetrahydrofuran (Stabilized), Reagent ACS

(Contd. of page 1)

· Hazard statements
Highly flammable liquid and vapor.
Causes serious eye irritation.
Suspected of causing cancer.
May cause respiratory irritation.
· Precautionary statements
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting/equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Avoid breathing dust/fume/gas/mist/vapors/spray
Wash thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.
If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.
Continue rinsing.
IF exposed or concerned: Get medical advice/attention.
Call a poison center/doctor if you feel unwell.
If eye irritation persists: Get medical advice/attention.
In case of fire: Use CO2, powder or water spray to extinguish.
Store in a well-ventilated place. Keep container tightly closed.
Store in a well-ventilated place. Keep cool.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.
· Classification system:
· NFPA ratings (scale 0 - 4)

Health = 2
Fire = 3
Reactivity = 0
· HMIS-ratings (scale 0 - 4)

Health = 2
Fire = 3
Reactivity = 0
· Other hazards
· Results of PBT and vPvB assessment
· PBT: Not applicable.

· vPvB: Not applicable.

3 Composition/information on ingredients

· Chemical characterization: Substances
· CAS No. Description

CAS: 109-99-9 Tetrahydrofuran

· Identification number(s)
· EC number: 203-726-8

(Contd. on page 3)

Safety Data Sheet

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· **Index number:** 603-025-00-0

(Contd. of page 2)

4 First-aid measures

- **Description of first aid measures**
- **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- **After skin contact:** Generally the product does not irritate the skin.
- **After eye contact:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- **After swallowing:** If symptoms persist consult doctor.
- **Information for doctor:**
- **Most important symptoms and effects, both acute and delayed** No further relevant information available.
- **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

- **Extinguishing media**
- **Suitable extinguishing agents:**
CO₂, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **Special hazards arising from the substance or mixture** No further relevant information available.
- **Advice for firefighters**
- **Protective equipment:** No special measures required.

6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**
Wear protective equipment. Keep unprotected persons away.
- **Environmental precautions:**
Dilute with plenty of water.
Do not allow to enter sewers/ surface or ground water.
- **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
- **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
- **Protective Action Criteria for Chemicals**
- **PAC-1:** 100 ppm
- **PAC-2:** 500 ppm
- **PAC-3:** 5000* ppm

7 Handling and storage

- **Handling:**
- **Precautions for safe handling** No special precautions are necessary if used correctly.
- **Information about protection against explosions and fires:**
Keep ignition sources away - Do not smoke.

(Contd. on page 4)

Safety Data Sheet

acc. to OSHA HCS

Printing date 02/28/2022

Reviewed on 02/28/2022

Trade name: Tetrahydrofuran (Stabilized), Reagent ACS

(Contd. of page 3)

Protect against electrostatic charges.

- **Conditions for safe storage, including any incompatibilities**
- **Storage:**
- **Requirements to be met by storerooms and receptacles:** Store in a cool location.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:**
Keep receptacle tightly sealed.
Store in cool, dry conditions in well sealed receptacles.
- **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

- **Additional information about design of technical systems:** No further data; see item 7.
- **Control parameters**

· **Components with limit values that require monitoring at the workplace:**

CAS: 109-99-9 Tetrahydrofuran

PEL	Long-term value: 590 mg/m ³ , 200 ppm
REL	Short-term value: 735 mg/m ³ , 250 ppm Long-term value: 590 mg/m ³ , 200 ppm
TLV	Short-term value: 100 ppm Long-term value: 50 ppm Skin, A3

· **Ingredients with biological limit values:**

CAS: 109-99-9 Tetrahydrofuran

BEI	2 mg/L LD50 Intraperitoneal: urine Time: end of shift LD50: Tetrahydrofuran
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- **Additional information:** The lists that were valid during the creation were used as basis.
- **Exposure controls**
- **Personal protective equipment:**
- **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes.
Avoid contact with the eyes and skin.
- **Breathing equipment:**
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.
- **Protection of hands:**
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
- **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

(Contd. on page 5)

Safety Data Sheet

acc. to OSHA HCS

Printing date 02/28/2022

Reviewed on 02/28/2022

Trade name: Tetrahydrofuran (Stabilized), Reagent ACS

(Contd. of page 4)

· Penetration time of glove material

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

· Eye protection:


Tightly sealed goggles

· Body protection: Protective work clothing

9 Physical and chemical properties

· Information on basic physical and chemical properties
· General Information
· Appearance:
Form: Liquid

Color: Colorless

· Odor: Ether-like

· Odor threshold: Not determined.

· pH-value: Not determined.

· Change in condition
Melting point/Melting range: -108.5 °C (-163.3 °F)

Boiling point/Boiling range: 65.5 °C (149.9 °F)

· Flash point: -21 °C (-5.8 °F)

· Flammability (solid, gaseous): Not applicable.

· Ignition temperature: 230 °C (446 °F)

· Decomposition temperature: Not determined.

· Auto igniting: Not determined.

· Danger of explosion: Product is not explosive. However, formation of explosive air/vapor mixtures are possible.

· Explosion limits:
Lower: 1.5 Vol %

Upper: 12 Vol %

· Vapor pressure at 20 °C (68 °F): 200 hPa (150 mm Hg)

· Density at 20 °C (68 °F): 0.8892 g/cm³ (7.42037 lbs/gal)

· Relative density Not determined.

· Vapor density Not determined.

· Evaporation rate Not determined.

· Solubility in / Miscibility with
Water: Fully miscible.

· Partition coefficient (n-octanol/water): Not determined.

· Viscosity:
Dynamic: Not determined.

Kinematic: Not determined.

(Contd. on page 6)

US

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Printing date 02/28/2022

Reviewed on 02/28/2022

Trade name: Tetrahydrofuran (Stabilized), Reagent ACS

(Contd. of page 5)

· **Other information**

No further relevant information available.

10 Stability and reactivity

- **Reactivity** No further relevant information available.
- **Chemical stability**
- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Possibility of hazardous reactions** No dangerous reactions known.
- **Conditions to avoid** No further relevant information available.
- **Incompatible materials:** No further relevant information available.
- **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

- **Information on toxicological effects**
- **Acute toxicity:**
- **Primary irritant effect:**
- **on the skin:** No irritant effect.
- **on the eye:** Irritating effect.
- **Sensitization:** No sensitizing effects known.
- **Additional toxicological information:**
- **Carcinogenic categories**
- **IARC (International Agency for Research on Cancer) 2B**
- **NTP (National Toxicology Program)** Substance is not listed.
- **OSHA-Ca (Occupational Safety & Health Administration)** Substance is not listed.

12 Ecological information

- **Toxicity**
- **Aquatic toxicity:** No further relevant information available.
- **Persistence and degradability** No further relevant information available.
- **Behavior in environmental systems:**
- **Bioaccumulative potential** No further relevant information available.
- **Mobility in soil** No further relevant information available.
- **Additional ecological information:**
- **General notes:**
- Water hazard class 1 (Assessment by list): slightly hazardous for water
- Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
- **Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **Other adverse effects** No further relevant information available.

13 Disposal considerations

- **Waste treatment methods**
- **Recommendation:**
- Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

(Contd. on page 7)

Safety Data Sheet

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Trade name: Tetrahydrofuran (Stabilized), Reagent ACS

(Contd. of page 6)

- **Uncleaned packagings:**
- **Recommendation:** Disposal must be made according to official regulations.
- **Recommended cleansing agent:** Water, if necessary with cleansing agents.

14 Transport information

- | | |
|--------------------------|--------|
| · UN-Number | |
| · DOT, IMDG, IATA | UN2056 |
- | | |
|----------------------------------|-----------------|
| · UN proper shipping name | |
| · DOT | Tetrahydrofuran |
| · IMDG, IATA | TETRAHYDROFURAN |

- **Transport hazard class(es)**

- **DOT**



- | | |
|----------------|---------------------|
| · Class | 3 Flammable liquids |
| · Label | 3 |

- **IMDG, IATA**



- | | |
|----------------|---------------------|
| · Class | 3 Flammable liquids |
| · Label | 3 |

- **Packing group**

- | | |
|--------------------------|----|
| · DOT, IMDG, IATA | II |
|--------------------------|----|

- **Environmental hazards:**

- | | |
|----------------------------|----|
| · Marine pollutant: | No |
|----------------------------|----|

- | | |
|---------------------------------------|----------------------------|
| · Special precautions for user | Warning: Flammable liquids |
|---------------------------------------|----------------------------|

- | | |
|--|----|
| · Hazard identification number (Kemler code): | 33 |
|--|----|

- | | |
|----------------------|------|
| · EMS Number: | 3-06 |
|----------------------|------|

- | | |
|---------------------------|---|
| · Stowage Category | B |
|---------------------------|---|

- | | |
|--|-----------------|
| · Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code | Not applicable. |
|--|-----------------|

- **Transport/Additional information:**

- **DOT**

- | | |
|-------------------------------|---|
| · Quantity limitations | On passenger aircraft/rail: 5 L
On cargo aircraft only: 60 L |
|-------------------------------|---|

- | | |
|-------------------------------|------------------|
| · Hazardous substance: | 1000 lbs, 454 kg |
|-------------------------------|------------------|

- **IMDG**

- | | |
|----------------------------------|----|
| · Limited quantities (LQ) | IL |
|----------------------------------|----|

(Contd. on page 8)

US

Safety Data Sheet

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Printing date 02/28/2022

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Trade name: Tetrahydrofuran (Stabilized), Reagent ACS

(Contd. of page 7)

· **Excepted quantities (EQ)**

Code: E2

Maximum net quantity per inner packaging: 30 ml

Maximum net quantity per outer packaging: 500 ml

· **UN "Model Regulation":**

UN 2056 TETRAHYDROFURAN, 3, II

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**

No further relevant information available.

· **Sara**· **Section 355 (extremely hazardous substances):** Substance is not listed.· **Section 313 (Specific toxic chemical listings):** Substance is not listed.· **TSCA (Toxic Substances Control Act):** ACTIVE· **Hazardous Air Pollutants** Substance is not listed.· **Proposition 65**· **Chemicals known to cause cancer:** Substance is listed.· **Chemicals known to cause reproductive toxicity for females:** Substance is not listed.· **Chemicals known to cause reproductive toxicity for males:** Substance is not listed.· **Chemicals known to cause developmental toxicity:** Substance is not listed.· **Carcinogenic categories**· **EPA (Environmental Protection Agency) SC**· **TLV (Threshold Limit Value) A3**· **NIOSH-Ca (National Institute for Occupational Safety and Health)** Substance is not listed.· **GHS label elements** The substance is classified and labeled according to the Globally Harmonized System (GHS).· **Hazard pictograms**

GHS02

GHS07

GHS08

· **Signal word** Danger· **Hazard statements**

Highly flammable liquid and vapor.

Causes serious eye irritation.

Suspected of causing cancer.

May cause respiratory irritation.

· **Precautionary statements**

Obtain special instructions before use.

Do not handle until all safety precautions have been read and understood.

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

Ground/bond container and receiving equipment.

Use explosion-proof electrical/ventilating/lighting/equipment.

Use only non-sparking tools.

Take precautionary measures against static discharge.

Avoid breathing dust/fume/gas/mist/vapors/spray

Wash thoroughly after handling.

Use only outdoors or in a well-ventilated area.

Wear protective gloves/protective clothing/eye protection/face protection.

If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

(Contd. on page 9)

Safety Data Sheet

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Trade name: Tetrahydrofuran (Stabilized), Reagent ACS

(Contd. of page 8)

IF INHALED: Remove person to fresh air and keep comfortable for breathing.

If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

IF exposed or concerned: Get medical advice/attention.

Call a poison center/doctor if you feel unwell.

If eye irritation persists: Get medical advice/attention.

In case of fire: Use CO₂, powder or water spray to extinguish.

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

Store in a well-ventilated place. Keep cool.

Store locked up.

Dispose of contents/container in accordance with local/regional/national/international regulations.

· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing SDS:** Environment protection department.

· **Contact:**

· **Date of preparation / last revision**

Revision 1.0 01-10-2022, removed fluoride and sulfate from ingredients. STN

*Revision 1.0, 04-04-2018: revised to a solution format instead of a raw material format. STN
02/28/2022 / 1.0*

· **Abbreviations and acronyms:**

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

EINECS: European Inventory of Existing Commercial Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

NFPA: National Fire Protection Association (USA)

HMIS: Hazardous Materials Identification System (USA)

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

NIOSH: National Institute for Occupational Safety

OSHA: Occupational Safety & Health

TLV: Threshold Limit Value

PEL: Permissible Exposure Limit

REL: Recommended Exposure Limit

BEI: Biological Exposure Limit

Flammable Liquids 2: Flammable liquids – Category 2

Eye Irritation 2A: Serious eye damage/eye irritation – Category 2A

Carcinogenicity 2: Carcinogenicity – Category 2

Specific Target Organ Toxicity - Single Exposure 3: Specific target organ toxicity (single exposure) – Category 3

· *** Data compared to the previous version altered.**