Tetrahydrofuran

SECTION 1: Identification of the substance/mixture and of the supplier

Product name: **Tetrahydrofuran**

Manufacturer/Supplier Trade name:

Manufacturer/Supplier Article number: **S25802**

Recommended uses of the product and restrictions on use:

Manufacturer Details:

AquaPhoenix Scientific, Inc
9 Barnhart Drive, Hanover, PA 17331
(717) 632-1291

Supplier Details:

Fisher Science Education
6771 Silver Crest Road, Nazareth, PA 18064
(724)517-1954

Emergency telephone number:

Fisher Science Education
Emergency Telephone No.: 800-535-5053

SECTION 2: Hazards identification

Classification of the substance or mixture:

Flammable
Flammable liquids, category 2

Health hazard
Carcinogenicity, category 2

Irritant
Eye irritation, category 2A

Flammable liq. 2.
Eye irrit. 2A.
Carcin. 2.
Specific Target. Organ tox. 3.

Signal word: Danger

Hazard statements:

Highly flammable liquid and vapour.
Causes serious eye irritation.
May cause respiratory irritation.
Suspected of causing cancer.

Precautionary statements:

If medical advice is needed, have product container or label at hand.
Keep out of reach of children.
Read label before use.
Obtain special instructions before use.

Wash ... thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.
Do not eat, drink or smoke when using this product.
Do not handle until all safety precautions have been read and understood.
Keep away from heat/sparks/open flames/hot surfaces. No smoking.
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/light/.../equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Avoid breathing dust/fume/gas/mist/vapours/spray.
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF INHALED: Remove victim to fresh air and keep at rest in a position 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.
If eye irritation persists get medical advice/attention.
In case of fire: Use ... for extinction.
Store in a well ventilated place. Keep container tightly closed.
Store locked up.
Dispose of contents/container to ....

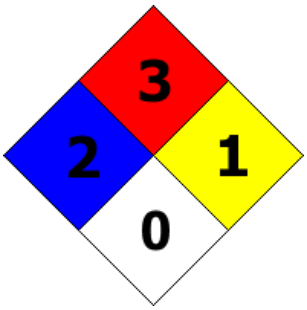
Other Non-GHS Classification:

WHMIS

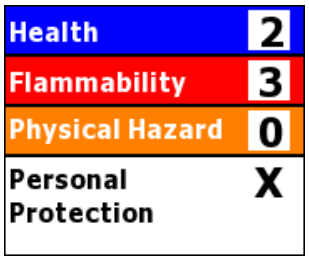
B2 

D2B 

NFPA/HMIS



NFPA SCALE (0-4)



HMIS RATINGS (0-4)

SECTION 3: Composition/information on ingredients

Ingredients:		
CAS 109-99-9	Tetrahydrofuran	>95 %
		Percentages are by weight

SECTION 4: First aid measures

Description of first aid measures

After inhalation:

Seek medical advice if discomfort or irritation persists. Remove to fresh air. Give artificial respiration if necessary. If breathing is difficult give oxygen.

After skin contact:

Seek medical attention if irritation persists or if concerned. Wash hands and exposed skin with soap and plenty of water.

After eye contact:

Protect unexposed eye. Rinse or flush exposed eye gently using water for 15-20 minutes. Remove contact lenses while rinsing. Immediately get medical assistance.

After swallowing:

Rinse mouth thoroughly. Do not induce vomiting unless directed to do so by medical personnel. Dilute mouth with water or milk after rinsing. Get medical assistance.

Most important symptoms and effects, both acute and delayed:

Irritation. Nausea. Headache. Shortness of breath.

Indication of any immediate medical attention and special treatment needed:

If seeking medical attention provide SDS document to physician.

SECTION 5: Firefighting measures

Extinguishing media

Suitable extinguishing agents:

Use dry chemical, chemical foam, carbon dioxide, or alcohol-resistant foam.

Unsuitable extinguishing agents:

Water may be ineffective.

Special hazards arising from the substance or mixture:

Forms peroxides of unknown stability. Vapor may cause flash fire. Vapors can travel to ignition sources and flash back. Vapors can spread along the ground and collect in confined areas.

Advice for firefighters:

Protective equipment:

Fire Fighting Instructions: Use normal procedures. Use protective clothing. Use NIOSH approved breathing equipment.

Additional information (precautions):

Ensure adequate ventilation. Avoid contact with skin, eyes, and clothing. Remove all sources of ignition. Wear protective eyeware, gloves, and clothing.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures:

Use spark-proof tools and explosion-proof equipment. Beware of vapors accumulating to form explosive concentrations.

Environmental precautions:

Should not be released into environment. Prevent from reaching drains, sewer, or waterway. If able prevent further leakage or spillage.

Methods and material for containment and cleaning up:

Follow Chemical Hygiene Plan. Remove all sources of ignition. Soak up with inert absorbent material. Keep in

suitable closed containers for disposal. Use spark-proof tools and explosion-proof equipment. Always obey local regulations.

Reference to other sections: None

SECTION 7: Handling and storage

Precautions for safe handling:

Wash hands and exposed skin with soap and plenty of water. Wash hands before breaks and immediately after handling the product. Empty containers retain product residue and can be dangerous. Follow good hygiene procedures when handling chemical materials. Avoid splashes or spray in enclosed areas. Use under a fume hood. Use explosion-proof equipment. Keep away from open flames, hot surfaces, and sources of ignition.

Conditions for safe storage, including any incompatibilities:

Store product and empty container away from heat and sources of ignition. Store protected from moisture and light. Should crystals form in a peroxidizable liquid peroxidation may have occurred and should be considered extremely dangerous. Contact professionals. Avoid storage near extreme heat, ignition sources or open flame. Store with like hazards. Keep container tightly closed in a cool, dry, and well-ventilated area.

SECTION 8: Exposure controls/personal protection





Control Parameters:

109-99-9, Tetrahydrofuran-USA. ACGIH Threshold Limit Values (TLV) TWA 50 ppm, Central Nervous System impairment Upper Respiratory Tract irritation Kidney damage Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption.
109-99-9, Tetrahydrofuran-USA. ACGIH Threshold Limit Values (TLV) STEL 100 ppm, Central Nervous System impairment Upper Respiratory Tract irritation Kidney damage Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption.
109-99-9, Tetrahydrofuran-USA. NIOSH Recommended Exposure Limits, TWA 200 ppm 590 mg/m3.
109-99-9, Tetrahydrofuran-USA. NIOSH Recommended Exposure Limits, ST 250 ppm 735 mg/m3.
109-99-9, Tetrahydrofuran, 2 mg/l Urine ACGIH - Biological Exposure Indices (BEI).

Appropriate Engineering controls:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapor or mists below the applicable workplace exposure limits (Occupational Exposure Limits-OELs) indicated above. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of use or handling. Use with adequate ventilation. Use spark-proof tools and explosion-proof equipment.

Respiratory protection:

Use under a fume hood. Local or general exhaust is recommended. Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multipurpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Protection of skin: Select glove material impermeable and resistant to the substance. Select PPE according to the concentration and amount of the dangerous substance at the specific workplace. Select glove material based on rates of diffusion and degradation. Wear protective eyeware, gloves, and clothing. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Complete suit protecting against chemicals. Flame retardant anti-static protective clothing.

Eye protection: Safety glasses with side shields or goggles. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

General hygienic measures: Wash hands before breaks and immediately after handling the product. Wash hands and exposed skin with soap and plenty of water. Keep away from food, beverages, and feed sources. Remove contaminated clothing and shoes. Before wearing wash contaminated clothing.

SECTION 9: Physical and chemical properties

Appearance (physical state, color):	Clear colorless liquid	**Explosion limit lower**: **Explosion limit upper**:	2.0% 11.8%
Odor:	Petroleum distillates	**Vapor pressure at 20°C**:	200 mbar @ 20 °C
Odor threshold:	Not Available	**Vapor density**:	2.5
pH-value:	7-8 20% aqueous solution	**Relative density**:	Not Available
Melting/Freezing point:	-108.4°C	**Solubilities**:	Soluble.
Boiling point/Boiling range:	66°C	**Partition coefficient (n-octanol/water)**:	Not Available
Flash point (closed cup):	-21°C	**Auto/Self-ignition temperature**:	215°C
Evaporation rate:	>1	**Decomposition temperature**:	Not Available
Flammability (solid, gaseous):	Not Available	**Viscosity**:	a. Kinematic: Not Available b. Dynamic: Not Available
Density at 20°C:	Not Available		

SECTION 10: Stability and reactivity

Reactivity:

Stable under normal conditions.

Chemical stability:

Peroxidizable compounds can form and accumulate peroxides which may explode when heated.

Possible hazardous reactions:

None under normal processing.

Conditions to avoid:

Light, ignition sources, excess heat, moisture, confined spaces, and evaporating to near dryness.

Incompatible materials:

Strong acids. Caustic alkalis. Strong oxidizers. Oxygen. Bromine. Metal Halides. Lithium tetrahydroaluminate. Borane. Sodium aluminum hydride. Sodium tetrahydroaluminate.

Hazardous decomposition products:

Carbon oxides (CO, CO2).

SECTION 11: Toxicological information

Acute Toxicity:

Oral:

APS LD50 orl-rat: 1650mg/kg

Dermal:

APS LC50 inhalation-rat: 21000ppm/3H

Chronic Toxicity: No additional information.

Corrosion Irritation:

Dermal:

APS Causes severe burns by all routes of exposure.

Sensitization:

No information available.

Numerical Measures: No additional information.

Carcinogenicity:

Tetrahydrofuran: Potential cancer hazard.

Mutagenicity:

Not mutagenic in AMES test.

Reproductive Toxicity:

Experiments have shown reproductive toxicity effects on laboratory animals.

SECTION 12: Ecological information

Ecotoxicity:

Aquatic Tox.: Considered to be toxic to aquatic life

Acute: Fathead Minnow 96-hr LC50 : LC50 2160 mg/l (Source: ECHA)

Chronic: Fathead Minnow 33-day NOEC: 216 mg/l

Acute: Daphnia Magna 48–hr LC50 3485 ppm, NOEC: 1500 ppm

Persistence and degradability:

Readily degradable in the environment.

Bioaccumulative potential: No additional information.

Mobility in soil:

Aqueous solution has high mobility in soil.

Other adverse effects: No additional information.

SECTION 13: Disposal considerations

Waste disposal recommendations:

It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities (US 40CFR262.11). US EPA guidelines for the classification determination are

listed in 40 CFR Parts 261.3. Consult federal, state, provincial, and local regulations regarding the proper disposal of waste material that may incorporate some amount of this product. Comply with all local, state, and federal regulations.

SECTION 14: Transport information

US DOT

UN Number:
ADR, ADN, DOT, IMDG, IATA UN2056

Limited Quantity Exception: None

Bulk:
RQ (if applicable): None
Proper shipping Name: Tetrahydrofuran.
Hazard Class: None
Packing Group: II.
Marine Pollutant (if applicable): No additional information.
Comments: None

Non Bulk:
RQ (if applicable): None
Proper shipping Name: Tetrahydrofuran.
Hazard Class: None
Packing Group: II.
Marine Pollutant (if applicable): No additional information.
Comments: None

SECTION 15: Regulatory information

United States (USA)

SARA Section 311/312 (Specific toxic chemical listings):

Acute, Chronic, Fire

SARA Section 313 (Specific toxic chemical listings):

None of the ingredients are listed.

RCRA (hazardous waste code):

109-99-9 Tetrahydrofuran U213.

TSCA (Toxic Substances Control Act):

All ingredients are listed.

CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act):

109-99-9 Tetrahydrofuran 1000.

Proposition 65 (California):

Chemicals known to cause cancer:

None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for females:

None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for males:

None of the ingredients are listed.

Chemicals known to cause developmental toxicity:

None of the ingredients are listed.

Canada

Canadian Domestic Substances List (DSL):

All ingredients are listed.

Canadian NPRI Ingredient Disclosure list (limit 0.1%):

None of the ingredients are listed.

Canadian NPRI Ingredient Disclosure list (limit 1%):

None of the ingredients are listed.

SECTION 16: Other information

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations. Note. The responsibility to provide a safe workplace remains with the user. The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment. The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material. It is the responsibility of the user to comply with all applicable laws and regulations applicable to this material.

GHS Full Text Phrases: None

Abbreviations and Acronyms:

IMDG International Maritime Code for Dangerous Goods.
PNEC Predicted No-Effect Concentration (REACH).
CFR Code of Federal Regulations (USA).
SARA Superfund Amendments and Reauthorization Act (USA).
RCRA Resource Conservation and Recovery Act (USA).
TSCA Toxic Substances Control Act (USA).
NPRI National Pollutant Release Inventory (Canada).
DOT US Department of Transportation.
IATA International Air Transport Association.
GHS Globally Harmonized System of Classification and Labelling of Chemicals.
ACGIH American Conference of Governmental Industrial Hygienists.
CAS Chemical Abstracts Service (division of the American Chemical Society).
NFPA National Fire Protection Association (USA).
HMIS Hazardous Materials Identification System (USA).
WHMIS Workplace Hazardous Materials Information System (Canada).
DNEL Derived No-Effect Level (REACH).

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