Tetrahydrofuran MSDS

1. Product Name and Identification

Product Name: Tetrahydrofuran (THF)
Synonyms: Oxolane, Diethylene oxide, Butylene oxide
Chemical Formula: C_4H_8O
Molecular Weight: 72.11 g/mol
CAS Number: 109-99-9
Intended Use: Solvent in organic synthesis, polymerization reactions, and resin coating applications

2. Composition/Ingredients

Substance	CAS Number	Proportion (%)
Tetrahydrofuran	109-99-9	≥99%
Impurities (trace levels)	---	≤1%

3. Hazards Identification

Classification:

- Highly flammable liquid and vapor.
- May cause eye and respiratory irritation.
- May cause dizziness or central nervous system (CNS) depression with prolonged exposure.

Potential Hazards:

- **Health Hazards:** Can irritate eyes, skin, and respiratory tract. Prolonged inhalation may cause dizziness, headaches, or nausea.
- **Fire Hazards:** Produces flammable vapor-air mixtures.
- **Environmental Hazards:** Not highly persistent in the environment but improper handling can harm aquatic ecosystems.

GHS Label Elements:

- **Pictogram:**
  🔥 (Flammable), ⚠ (Irritant)
- **Signal Word:** Danger
- **Hazard Statements:**
  - H225 - Highly flammable liquid and vapor.
  - H319 - Causes serious eye irritation.

    - H336 - May cause drowsiness or dizziness.
- **Precautionary Statements:**
    - Keep away from heat, sparks, and open flames.
    - Use only in well-ventilated areas.
    - Avoid breathing vapors.

4. First Aid Measures

Skin Contact:
Immediately wash skin with soap and water. Remove contaminated clothing. If irritation persists, seek medical advice.

Eye Contact:
Rinse eyes thoroughly with water for at least 15 minutes, keeping eyelids open. Seek medical attention if irritation continues.

Inhalation:
Move to fresh air. If symptoms like dizziness or difficulty breathing occur, call a physician immediately. Use oxygen if needed.

Ingestion:
Rinse mouth with water. Do not induce vomiting. Seek medical attention immediately.

5. Handling and Storage

Handling:

- Keep away from heat, sparks, and open flames.
- Wear proper protective equipment, including gloves and eye protection.
- Avoid inhalation of vapors and prevent prolonged skin contact.

Storage:

- Store in a tightly sealed container in a dry, cool, and well-ventilated area.
- Protect from direct sunlight and sources of ignition.
- Store away from oxidizing agents and strong acids.

6. Exposure Controls/Personal Protection

Engineering Controls:
Ensure adequate ventilation in work areas. Use explosion-proof equipment when handling large quantities or working in confined spaces.

Personal Protection Equipment (PPE):

- **Eye Protection:** Safety goggles or face shield.
- **Skin Protection:** Chemical-resistant gloves and protective clothing.
- **Respiratory Protection:** Use a respirator with organic vapor cartridges in poorly ventilated areas.

Exposure Limits:

- OSHA PEL (Permissible Exposure Limit): 200 ppm (8-hour TWA)
- ACGIH TLV (Threshold Limit Value): 50 ppm

7. Physical and Chemical Properties

Property	Value
Form	Clear, colorless liquid
Color	Colorless
Odor	Ether-like odor
pH	Not applicable
Melting Point	-108.5°C
Boiling Point	65-66°C
Flash Point	-20°C (closed cup)
Autoignition Temperature	215°C
Solubility (Water)	Miscible
Vapor Pressure	~143 mmHg at 20°C
Specific Gravity	0.89 at 20°C

8. Stability and Reactivity

Stability: Stable under recommended storage conditions. However, forms hazardous peroxides when exposed to air over time.

Conditions to Avoid:

- Heat, sparks, flames, and other sources of ignition
- Prolonged exposure to air, as it can form explosive peroxides

Materials to Avoid:

- Strong acids, bases, and oxidizing agents
- Air or oxygen (forms peroxides with prolonged exposure)

Decomposition Products:
May release carbon monoxide, carbon dioxide, and toxic organic vapors when decomposed.

9. Toxicological Information

Routes of Exposure: Skin contact, eye contact, inhalation, ingestion.

Toxic Effects:

- Eye irritation may result from direct contact.
- Prolonged or repeated exposure can cause dizziness, headaches, or respiratory discomfort.
- May have narcotic effects at high concentrations.

Chronic Effects:

- Long-term exposure may lead to liver or kidney damage.

LD50 Data:

- Oral (rat): ~2,500 mg/kg
- Dermal (rabbit): ~2,100 mg/kg

10. Disposal Considerations

Dispose of contents and container in accordance with local, regional, and national regulations. Do not dispose of into drains, waterways, or soil.

Disposal Recommendations:

- Small quantities should be absorbed with inert materials and containerized for disposal.
- Large quantities should be handled by a licensed hazardous waste disposal provider. Ensure proper labeling and safety precautions are in place during transport.
