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Material Safety Data Sheet

Trimethyl orthoformate MSDS

Section 1: Chemical Product and Company Identification

Product Name: Trimethyl orthoformate

CAS#: 149-73-5

RTECS: RM6650000

TSCA: TSCA 8(b) inventory: Trimethyl Orthoformate

CI#: Not applicable.

Synonym: Methyl Orthoformate; Methane, trimethoxy-; Trimethoxymethane

Chemical Name: Orthoformic acid, Trimethyl Ester

Chemical Formula: C4-H10-O3

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Section 2: Composition and Information on Ingredients

Composition:

Name	CAS # %	By Weight
Trimethyl Orthoformate	149-73-5	≥ 100.0%

Toxicological Data on Ingredients: Trimethyl Orthoformate: ORAL (LD50): Acute: 3130 mg/kg [Rat (Sax, 1992)]. VAPOR (LC50): Acute: 5000 ppm 4 hours [Rat (Sax, 1992)].

Section 3: Hazards Identification

Potential Acute Health Effects:

Hazardous in case of eye contact (irritant), of inhalation (lung irritant). Slightly hazardous in case of skin contact (irritant), of ingestion, .

Potential Chronic Health Effects:

CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available.

DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to upper respiratory tract, skin, eyes. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

Skin Contact:

In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact: Not available.

Inhalation:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation:

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 255°C (491°F)

Flash Points: CLOSED CUP: 15°C (59°F).

Flammable Limits: LOWER: 1.4% UPPER: 44.5%

Products of Combustion: These products are carbon oxides (CO, CO₂).

Fire Hazards in Presence of Various Substances:

Highly flammable in presence of open flames and sparks, of heat. Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in

presence of static discharge: Not available.

Fire Fighting Media and Instructions:

Flammable liquid. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:

Flammable liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed.

Section 7: Handling and Storage

Precautions:

Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Avoid contact with eyes. Wear suitable protective clothing. If ingested, seek medical

advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents, combustible materials, acids.

Storage:

Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame). Moisture sensitive.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:

Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits: Not available.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Pungent. Aromatic, ester-like

Taste: Not available.

Molecular Weight: 106.12 g/mole

Color: Colorless. Clear

pH (1% soln/water): Not available.

Boiling Point: 100.6°C (213.1°F)

Melting Point: -53°C (-63.4°F)

Critical Temperature: Not available.

Specific Gravity: 0.9676 (Water = 1)

Vapor Pressure: Not available.

Vapor Density: 3.67 (Air = 1)

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: The product is more soluble in oil; $\log(\text{oil/water}) = 0.3$

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether.

Solubility:

Soluble in diethyl ether. Soluble in Ethanol. Hydrolyzes in water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ignition sources, incompatible materials, moisture

Incompatibility with various substances: Reactive with oxidizing agents, combustible materials, acids.

Corrosivity: Not available.

Special Remarks on Reactivity: Moisture sensitive

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Eye contact. Inhalation.

Toxicity to Animals:

WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE.

Acute oral

toxicity (LD50): 3130 mg/kg [Rat (Sax, 1992)]. Acute toxicity of the vapor (LC50): 5000 4 hours [Rat (Sax, 1992)].

Chronic Effects on Humans: May cause damage to the following organs: upper respiratory tract, skin, eyes.

Other Toxic Effects on Humans:

Hazardous in case of inhalation (lung irritant). Slightly hazardous in case of skin contact (irritant), of ingestion, .

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects: Skin: Causes mild skin irritation. Eyes: Eye contact causes moderate eye irritation. Vapor may cause eye irritation. May cause tearing, reddening and/or swelling. Inhalation: May cause respiratory tract irritation. Vapor may be narcotic at high concentrations. Ingestion: No data. Chronic Potential Health Effects: Prolonged or repeated skin contact may result in defatting and drying of the skin and dermatitis (rash). The toxicological properties of this substance have not been fully investigated.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 3: Flammable liquid.

Identification: : Ester, n.o.s.(Orthoformic Acid, Trimethyl Ester) UNNA: 3272 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations: TSCA 8(b) inventory: Trimethyl Orthoformate

Other Regulations:

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F).

DSCL (EEC):

R11- Highly flammable. R36/37/38- Irritating to eyes, respiratory system and skin. S9- Keep container in a well-ventilated place. S16- Keep away from sources of ignition - No smoking. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S29- Do not empty into drains. S33- Take

precautionary measures against static discharges. S36- Wear suitable protective clothing.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 3

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 3

Reactivity: 0

Specific hazard:

Protective Equipment:

Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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