



TRIETHYL ORTHOFORMATE (FORMYL-13C, 99%)

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830 and according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

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CLM-3742

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form : Substance
Substance name : TRIETHYL ORTHOFORMATE (FORMYL-13C, 99%)
EC-No. : 204-550-4 (Unlabeled)
CAS-No. : 122-51-0 (Unlabeled)
Product code : CLM-3742
Formula : *CH(OCH₂CH₃)₃
Synonyms : 1,1,1-Triethoxymethane

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

No additional information available

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Cambridge Isotope Laboratories, Inc.
50 Frontage Road
Andover, MA 01810
USA

USA: 1-800-322-1174 Int: 1-978-749-8000
cilsales@isotope.com www.isotope.com

Emergency telephone number

Emergency numbers:

Chemtrec: 1-800-424-9300 (24 hours)
International: 1-703-741-5970 (24 hours)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Flam. Liq. 3 H226

Full text of hazard classes and H-statements : see section 16

Classification according to Directive 67/548/EEC [DSD] or 1999/45/EC [DPD]

F; R10

Full text of R-phrases: see section 16

GHS-US classification

Flam. Liq. 3 H226

Full text of H statements : see section 16

Adverse physicochemical, human health and environmental effects

No additional information available

2.2. Label elements

Labeling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :



GHS02

Signal word (CLP) : Warning

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Hazard statements (CLP)	: H226 - Flammable liquid and vapor
Precautionary statements (CLP)	: P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P233 - Keep container tightly closed. P240 - Ground/bond container and receiving equipment. P241 - Use explosion-proof electrical, lighting, ventilating equipment P280 - Wear protective clothing, protective gloves. P303+P361+P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. P370+P378 - In case of fire: Use Carbon dioxide, Dry chemical, Alcohol resistant foam to extinguish. P403+P235 - Store in a well-ventilated place. Keep cool.

GHS-US labeling

Hazard pictograms (GHS-US)



GHS02

Signal word (GHS-US) : Warning
Hazard statements (GHS-US) : H226 - Flammable liquid and vapor

Precautionary statements (GHS-US) : P210 - Keep away from heat, hot surfaces, open flames, sparks. - No smoking.
P233 - Keep container tightly closed.
P240 - Ground/Bond container and receiving equipment
P241 - Use explosion-proof electrical, lighting, ventilating equipment
P242 - Use only non-sparking tools.
P243 - Take precautionary measures against static discharge.
P280 - Wear protective clothing, protective gloves.
P303+P361+P353 - If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
P370+P378 - In case of fire: Use Alcohol resistant foam, Dry chemical, Carbon dioxide, Water spray to extinguish.
P403+P235 - Store in a well-ventilated place. Keep cool.
P501 - Dispose of contents/container to Comply with applicable regulations

2.3. Other hazards

No additional information available

SECTION 3: Composition/Information on ingredients

3.1. Substances

Name	Product identifier	%	Classification according to Directive 67/548/EEC
TRIETHYL ORTHOFORMATE (FORMYL-13C, 99%)	(CAS-No.) 122-51-0 (Unlabeled) (EC-No.) 204-550-4 (Unlabeled)	100	F; R10
Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
TRIETHYL ORTHOFORMATE (FORMYL-13C, 99%)	(CAS-No.) 122-51-0 (Unlabeled) (EC-No.) 204-550-4 (Unlabeled)	100	Flam. Liq. 3, H226

Full text of R- and H- phrases: see section 16

Name	Product identifier	%	GHS-US classification
TRIETHYL ORTHOFORMATE (FORMYL-13C, 99%) (Main constituent)	(CAS-No.) 122-51-0 (Unlabeled)	100	Flam. Liq. 3, H226

Full text of H-phrases: see section 16

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : If you feel unwell, seek medical advice (show the label where possible). Evacuate danger area.

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First-aid measures after inhalation	: When symptoms occur: go into open air and ventilate suspected area. If not breathing give artificial respiration. Get medical advice/attention.
First-aid measures after skin contact	: Wash with plenty of soap and water. and soap. Get immediate medical advice/attention.
First-aid measures after eye contact	: Rinse cautiously with water for several minutes.
First-aid measures after ingestion	: Never give anything by mouth to an unconscious person. Rinse mouth out with water. Get medical advice/attention.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/effects after inhalation	: May be harmful if inhaled. May cause respiratory irritation.
Symptoms/effects after skin contact	: May be harmful in contact with skin. May cause moderate irritation.
Symptoms/effects after eye contact	: May cause eye irritation.
Symptoms/effects after ingestion	: May be harmful if swallowed.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray. dry chemical powder, alcohol-resistant foam, carbon dioxide (CO₂).

5.2. Special hazards arising from the substance or mixture

Fire hazard : Flammable liquid and vapor.
Reactivity : Vapors may form explosive mixture with air.

5.3. Advice for firefighters

Firefighting instructions : Use water spray to cool unopened containers.
Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection. Wear recommended personal protective equipment.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures : Avoid breathing vapors, mist, gas. Avoid dust formation.

6.1.2. For emergency responders

Protective equipment : Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent entry to sewers and public waters. Do not allow to enter drains or water courses. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment : Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations.
Methods for cleaning up : This material and its container must be disposed of in a safe way, and as per local legislation.

6.4. Reference to other sections

For further information refer to section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Provide adequate ventilation to minimize dust and/or vapor concentrations.
Hygiene measures : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Store in a well-ventilated place. Keep container tightly closed.
Storage conditions : Store at room temperature away from light and moisture.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

No additional information available

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8.2. Exposure controls

- Appropriate engineering controls : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.
- Personal protective equipment : Gloves. Protective clothing. Protective goggles. Self-contained breathing apparatus.



- Materials for protective clothing : Wear suitable protective clothing and gloves.
- Hand protection : Wear suitable protective clothing and gloves.
- Eye protection : Wear eye protection. Chemical goggles or face shield with safety glasses.
- Skin and body protection : Wear suitable protective clothing, gloves and eye/face protection.
- Respiratory protection : In case of inadequate ventilation wear respiratory protection. Approved supplied air respirator.
- Environmental exposure controls : Avoid release to the environment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

- Physical state : Liquid
- Appearance : Clear, Liquid.
- Molecular mass : 149.19 g/mol (Labeled)
- Color : Colorless.
- Odor : No data available
- Odor threshold : No data available
- pH : No data available
- Relative evaporation rate (butyl acetate=1) : No data available
- Melting point : -75.99 °C (- 104.78 °F)
- Freezing point : No data available
- Boiling point : 144 - 146 °C (291 - 295 °F) at 1,013 hPa (760 mmHg)
- Flash point : 35 °C (95 °F) - closed cup
- Auto-ignition temperature : 180 °C (356 °F) at 1,013 hPa (759.8 mmHg)
- Decomposition temperature : No data available
- Flammability (solid, gas) : No data available
- Vapor pressure : 13 hPa (10 mmHg) at 40.5 °C (104.9 °F)
- Relative vapor density at 20 °C : 5.12 (Air = 1.0)
- Relative density : No data available
- Specific gravity / density : 0.891 g/ml
- Solubility : Water: 1.65 g/l at 20 °C (38 °F)
- Log Pow : 1.2 at 20 °C (68 °F)
- Log Kow : No data available
- Viscosity, kinematic : No data available
- Viscosity, dynamic : No data available
- Explosive properties : No data available
- Oxidizing properties : No data available
- Explosion limits : No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Vapors may form explosive mixture with air.

10.2. Chemical stability

Five years after receipt if stored as stated in "Storage" section. Re-QC after 5 years.

10.3. Possibility of hazardous reactions

No additional information available

10.4. Conditions to avoid

Moisture, Heat, flames, and sparks.

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10.5. Incompatible materials

acids, Strong oxidizing agents.

10.6. Hazardous decomposition products

formed under fire conditions: Carbon oxides.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

TRIETHYL ORTHOFORMATE (FORMYL-13C, 99%) (122-51-0 (Unlabeled))	
LD50 oral rat	7060 mg/kg
LD50 dermal rabbit	18000 mg/kg
ATE CLP (oral)	7060.000 mg/kg body weight
ATE CLP (dermal)	17820.000 mg/kg body weight

Skin corrosion/irritation	: Skin - rabbit - Mild skin irritation - 24 h
Serious eye damage/irritation	: Eyes - rabbit - Moderate eye irritation - 24 h
Respiratory or skin sensitization	: No data available
Germ cell mutagenicity	: Not available
Carcinogenicity	: Not classified
Reproductive toxicity	: Not available
Specific target organ toxicity – single exposure	: Not classified
Specific target organ toxicity – repeated exposure	: Not classified
Aspiration hazard	: Not classified
Potential Adverse human health effects and symptoms	: This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.
Symptoms/effects after inhalation	: May be harmful if inhaled. May cause respiratory irritation.
Symptoms/effects after skin contact	: May be harmful in contact with skin. May cause moderate irritation.
Symptoms/effects after eye contact	: May cause eye irritation.
Symptoms/effects after ingestion	: May be harmful if swallowed.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : The product is not considered harmful to aquatic organisms or to cause long-term adverse effects in the environment.

TRIETHYL ORTHOFORMATE (FORMYL-13C, 99%) (122-51-0 (Unlabeled))	
LC50 fish 1	592 mg/l <i>Leuciscus idus</i> (Golden orfe) - 48 h
EC50 <i>Daphnia</i> 1	617 mg/l <i>Daphnia magna</i> (Water flea) - 48 h

12.2. Persistence and degradability

TRIETHYL ORTHOFORMATE (FORMYL-13C, 99%) (122-51-0 (Unlabeled))	
Persistence and degradability	Biodegradability aerobic - Exposure time 28 d.
Biodegradation	100 % Readily biodegradable

12.3. Bioaccumulative potential

TRIETHYL ORTHOFORMATE (FORMYL-13C, 99%) (122-51-0 (Unlabeled))	
Log Pow	1.2 at 20 °C (68 °F)
Bioaccumulative potential	Not available.

12.4. Mobility in soil

TRIETHYL ORTHOFORMATE (FORMYL-13C, 99%) (122-51-0 (Unlabeled))	
Ecology - soil	Not available.

12.5. Results of PBT and vPvB assessment

No additional information available

12.6. Other adverse effects

Other adverse effects : Not available.

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SECTION 13: Disposal considerations

13.1. Waste treatment methods

- Regional legislation (waste) : Waste materials should be disposed of under conditions which meet Federal, State, and local environmental control regulations.
- Product/Packaging disposal recommendations : Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.
- Ecology - waste materials : Dispose of as unused product.

SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

14.1. UN number

- UN-No.(DOT) : 2524
- DOT NA no. UN2524

14.2. UN proper shipping name

- Proper Shipping Name (DOT) : Ethyl orthoformate
- Class (DOT) : 3 - Class 3 - Flammable and combustible liquid 49 CFR 173.120
- Hazard labels (DOT) : 3 - Flammable liquid



- Packing group (DOT) : III - Minor Danger
- DOT Special Provisions (49 CFR 172.102) : B1 - If the material has a flash point at or above 38 C (100 F) and below 93 C (200 F), then the bulk packaging requirements of 173.241 of this subchapter are applicable. If the material has a flash point of less than 38 C (100 F), then the bulk packaging requirements of 173.242 of this subchapter are applicable.
IB3 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1 and 31HA2, 31HB2, 31HN2, 31HD2 and 31HH2). Additional Requirement: Only liquids with a vapor pressure less than or equal to 110 kPa at 50 C (1.1 bar at 122 F), or 130 kPa at 55 C (1.3 bar at 131 F) are authorized, except for UN2672 (also see Special Provision IP8 in Table 2 for UN2672).
T2 - 1.5 178.274(d)(2) Normal..... 178.275(d)(3)
TP1 - The maximum degree of filling must not exceed the degree of filling determined by the following: Degree of filling = $97 / 1 + a (tr - tf)$ Where: tr is the maximum mean bulk temperature during transport, and tf is the temperature in degrees celsius of the liquid during filling.
- DOT Packaging Exceptions (49 CFR 173.xxx) : 150
- DOT Packaging Non Bulk (49 CFR 173.xxx) : 203
- DOT Packaging Bulk (49 CFR 173.xxx) : 242
- Marine pollutant : No

14.3. Additional information

- Other information : No supplementary information available.

Overland transport

- Packing group (ADR) : III
- Class (ADR) : 3 - Flammable liquid
- Hazard identification number (Kemler No.) : 30
- Classification code (ADR) : F1
- Hazard labels (ADR) : 3 - Flammable liquids



- Orange plates : An orange rectangular label with a black border. The number "30" is in the top half and "2524" is in the bottom half, both in black text.

- Tunnel restriction code (ADR) : D/E

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Limited quantities (ADR) : 5l
EAC : •3Y
Excepted quantities (ADR) : E1

Transport by sea

DOT Vessel Stowage Location : A - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel.
MFAG-No : 129

Air transport

DOT Quantity Limitations Passenger aircraft/rail : 60 L
(49 CFR 173.27)
DOT Quantity Limitations Cargo aircraft only (49 : 220 L
CFR 175.75)
Civil Aeronautics Law : Flammable liquids

14.4. Environmental hazards

Other information : No supplementary information available.

14.5. Special precautions for user

14.6. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

SECTION 15: Regulatory information

15.1. US Federal regulations

TRIETHYL ORTHOFORMATE (FORMYL-13C, 99%) (122-51-0 (Unlabeled))	
SARA Section 302 Threshold Planning Quantity (TPQ)	Not subject to reporting requirements of the United States SARA Section 302
SARA Section 311/312 Hazard Classes	Fire hazard
SARA Section 313 - Emission Reporting	Not subject to reporting requirements of the United States SARA Section 313

15.2. International regulations

CANADA

TRIETHYL ORTHOFORMATE (FORMYL-13C, 99%) (122-51-0 (Unlabeled))
Listed on the Canadian DSL (Domestic Substances List)

15.2.1. National regulations

No additional information available

15.3. US State regulations

TRIETHYL ORTHOFORMATE (FORMYL-13C, 99%)(122-51-0 (Unlabeled))	
U.S. - California - Proposition 65 - Carcinogens List	No
U.S. - California - Proposition 65 - Developmental Toxicity	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No
State or local regulations	U.S. - Massachusetts - Right To Know List U.S. - Pennsylvania - RTK (Right to Know) List U.S. - New Jersey - Right to Know Hazardous Substance List

SECTION 16: Other information

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Other information : This product is not radioactive. The data given for this product are those of the corresponding unlabeled compound, unless specifically indicated otherwise. Health and safety data for labeled compounds are generally not available, but are assumed to be similar or identical to the corresponding unlabeled compound.

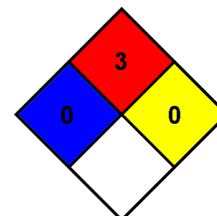
Full text of R-, H- and EUH-phrases:

Flam. Liq. 3	Flammable liquids Category 3
H226	Flammable liquid and vapor
R10	Flammable
F	Highly flammable

NFPA health hazard : 0 - Materials that, under emergency conditions, would offer no hazard beyond that of ordinary combustible materials.

NFPA fire hazard : 3 - Liquids and solids (including finely divided suspended solids) that can be ignited under almost all ambient temperature conditions.

NFPA reactivity : 0 - Material that in themselves are normally stable, even under fire conditions.



Hazard Rating

Health : 0 Minimal Hazard - No significant risk to health

Flammability : 3 Serious Hazard

Physical : 0 Minimal Hazard

CIL Substance SDS

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product