



# MATERIAL SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Revision Date 08/21/2013

Version 1.1

## SECTION 1. Identification

### Product identifier

Product number	843943
Product name	Propanephosphonic acid anhydride (50% solution in 2-Methyltetrahydrofuran) for synthesis T3P®

### Relevant identified uses of the substance or mixture and uses advised against

Identified uses	Use restricted under TSCA to research and development or as analytical reagent. Uses regulated under FDA or FIFRA are not affected. Chemical for synthesis
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### Details of the supplier of the safety data sheet

Company	EMD Millipore Corporation   290 Concord Road, Billerica, MA 01821, United States of America   SDS Phone Support: +1-978-715-1335   General Inquiries: +1-978-715-4321   Monday to Friday, 9:00 AM to 4:00 PM Eastern Time (GMT-5)
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Emergency telephone	800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week
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## SECTION 2. Hazards identification

### GHS Classification

Flammable liquid, Category 2, H225  
Skin corrosion, Category 1B, H314  
Specific target organ systemic toxicity - single exposure, Category 3, H335  
For the full text of the H-Statements mentioned in this Section, see Section 16.

### GHS-Labeling

#### Hazard pictograms



Signal Word  
Danger

#### Hazard Statements

H225 Highly flammable liquid and vapor.

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H314 Causes severe skin burns and eye damage.

H335 May cause respiratory irritation.

### *Precautionary Statements*

P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

P301 + P330 + P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P309 + P310 IF exposed or if you feel unwell: Immediately call a POISON CENTER or doctor/physician.

### **OSHA Hazards**

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

### **Other hazards**

None known.

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## **SECTION 3. Composition/information on ingredients**

Chemical nature                      Mixture of organic compounds

### **Hazardous ingredients**

*Chemical Name ( Concentration)*

CAS-No.

*Tetrahydro-2-methylfuran ( >= 30 % - < 50 % )*

96-47-9

*2,4,6-tri-n-propyl-2,4,6-trioxo-1,3,5,2,4,6-trioxatriphosphorinane ( >= 30 % - < 50 % )*

68957-94-8

*dipropyldiphosphonic acid ( >= 10 % - < 30 % )*

71760-04-8

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## **SECTION 4. First aid measures**

### **Description of first-aid measures**

#### *Inhalation*

After inhalation: fresh air. Call in physician.

#### *Skin contact*

After skin contact: wash off with plenty of water. Immediately remove contaminated clothing. If available swab with polyethylene glycol 400. Call a physician immediately.

#### *Eye contact*

After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist.

#### *Ingestion*

After swallowing: make victim drink water (two glasses at most), avoid vomiting (risk of perforation!). Call a physician immediately. Do not attempt to neutralize.

Never give anything by mouth to an unconscious person.

### **Most important symptoms and effects, both acute and delayed**

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Irritation and corrosion, Cough, Shortness of breath, respiratory arrest, Unconsciousness, inebriation, Nausea, Vomiting, Headache

### Indication of any immediate medical attention and special treatment needed

No information available.

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## SECTION 5. Fire-fighting measures

### Extinguishing media

*Suitable extinguishing media*

Carbon dioxide (CO<sub>2</sub>), Dry powder

*Unsuitable extinguishing media*

Water, Foam

### Special hazards arising from the substance or mixture

Combustible material

Vapors are heavier than air and may spread along floors.

Forms explosive mixtures with air at ambient temperatures.

Pay attention to flashback.

Development of hazardous combustion gases or vapors possible in the event of fire.

Fire may cause evolution of:

Oxides of phosphorus

May not get in touch with:

Water

Caution! in contact with water product releases:

Organic acids

### Advice for firefighters

*Special protective equipment for fire-fighters*

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

*Further information*

Remove container from danger zone and cool with water. Prevent fire extinguishing water from contaminating surface water or the ground water system. Suppress (knock down) gases/vapors/mists with a water spray jet.

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## SECTION 6. Accidental release measures

### Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders: Protective equipment see section 8.

### Environmental precautions

Do not let product enter drains. Risk of explosion.

### Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills.

Observe possible material restrictions (see sections 7 and 10).

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Take up with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

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### SECTION 7. Handling and storage

#### Precautions for safe handling

Work under hood. Do not inhale substance/mixture. Avoid generation of vapors/aerosols.

Observe label precautions.

#### *Advice on protection against fire and explosion*

Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.

#### Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition. Protected from light.

Store at +2°C to +8°C (+36°F to +46°F).

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### SECTION 8. Exposure controls/personal protection

#### Exposure limit(s)

Contains no substances with occupational exposure limit values.

#### Engineering measures

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

#### Individual protection measures

Protective clothing should be selected specifically for the workplace, depending on concentration and quantity of the hazardous substances handled. The chemical resistance of the protective equipment should be inquired at the respective supplier.

#### *Hygiene measures*

Immediately change contaminated clothing. Apply skin-protective barrier cream. Wash hands and face after working with substance. Work under hood. Do not inhale substance/mixture.

#### *Eye/face protection*

Tightly fitting safety goggles

#### *Hand protection*

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

#### *Other protective equipment:*

Flame retardant antistatic protective clothing

#### *Respiratory protection*

required when vapors/aerosols are generated.

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

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## SECTION 9. Physical and chemical properties

Physical state	liquid
Color	colorless to light brown
Odor	ether-like
Odor Threshold	No information available.
pH	No information available.
Melting point	No information available.
Boiling point/boiling range	172 - 176 °F ( 78 - 80 °C) (solvent)
Flash point	12 °F ( -11 °C) Method: c.c. (solvent)
Evaporation rate	No information available.
Flammability (solid, gas)	No information available.
Lower explosion limit	No information available.
Upper explosion limit	No information available.
Vapor pressure	No information available.
Relative vapor density	No information available.
Relative density	1.039 g/cm <sup>3</sup>
Water solubility	Hydrolyzis
Partition coefficient: n-octanol/water	No information available.
Autoignition temperature	No information available.
Decomposition temperature	No information available.
Viscosity, dynamic	No information available.
Explosive properties	No information available.

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## SECTION 10. Stability and reactivity

### Reactivity

Vapors may form explosive mixture with air.  
Formation of peroxides possible.

### Chemical stability

sensitive to moisture  
Sensitivity to light

### Possibility of hazardous reactions

the constituents may react with:  
Strong oxidizing agents, strong alkalis, Strong acids  
Violent reactions possible with:  
Water

### Conditions to avoid

Warming.  
A range from approx. 15 Kelvin below the flash point is to be rated as critical.  
Exposure to moisture.

### Incompatible materials

no information available

### Hazardous decomposition products

in the event of fire: See section 5.  
Peroxides

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## SECTION 11. Toxicological information

### Information on toxicological effects

#### *Likely route of exposure*

Eye contact, Skin contact

#### *Acute oral toxicity*

Symptoms: If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the esophagus and the stomach.

#### *Acute inhalation toxicity*

Symptoms: mucosal irritations, Cough, Shortness of breath, Possible damages:., damage of respiratory tract

#### *Skin irritation*

Mixture causes burns.

#### *Eye irritation*

Mixture causes serious eye damage.

#### *Specific target organ systemic toxicity - single exposure*

Mixture may cause respiratory irritation.

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### *Specific target organ systemic toxicity - repeated exposure*

The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

### *Aspiration hazard*

Regarding the available data the classification criteria are not fulfilled.

## **Carcinogenicity**

IARC	No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
OSHA	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
NTP	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
ACGIH	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

## **Further information**

Quantitative data on the toxicity of this product are not available.

Further toxicological data:

Decomposition of the substance with tissue moisture.

Property that must be anticipated on the basis from the components of the mixture:

Systemic effects:

Headache, inebriation, Unconsciousness, respiratory arrest, narcosis

Further data:

Other dangerous properties can not be excluded.

Handle in accordance with good industrial hygiene and safety practice.

## **Ingredients**

### *Tetrahydro-2-methylfuran*

#### *Acute oral toxicity*

LD50 rat: > 2,000 mg/kg (External MSDS)

#### *Acute inhalation toxicity*

LC50 rat: 6000 ppm; 4 h (RTECS)

#### *Acute dermal toxicity*

LD50 rabbit: 4,500 mg/kg (RTECS)

#### *Germ cell mutagenicity*

##### *Genotoxicity in vitro*

Ames test

Salmonella typhimurium

Result: negative

(National Toxicology Program)

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## *2,4,6-tri-n-propyl-2,4,6-trioxo-1,3,5,2,4,6-trioxatriphosphorinane*

### *Acute oral toxicity*

LD50 rat: > 2,000 mg/kg (External MSDS)

### *Acute dermal toxicity*

LD50 rat: > 2,000 mg/kg (External MSDS)

### *Repeated dose toxicity*

rat

Oral

28 d

NOAEL: 62.5 mg/kg  
(External MSDS)

## *dipropyldiphosphonic acid*

No information available.

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## SECTION 12. Ecological information

### Ecotoxicity

No information available.

### Persistence and degradability

No information available.

### Bioaccumulative potential

No information available.

### Mobility in soil

No information available.

## Ingredients

### *Tetrahydro-2-methylfuran*

#### *Toxicity to daphnia and other aquatic invertebrates*

EC50 Daphnia: > 139 mg/l; 48 h (External MSDS)

#### *Toxicity to algae*

ErC50 algae: > 104 mg/l; 72 h (External MSDS)

#### *Toxicity to bacteria*

Respiration inhibition EC50 activated sludge: > 1,000 mg/l  
OECD Test Guideline 209

#### *Biodegradability*

; aerobic

OECD Test Guideline 301D

Not biodegradable.

#### *Partition coefficient: n-octanol/water*

log Pow: 1.35

(calculated)

Bioaccumulation is not expected (log Pow <1). (Lit.)

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## *2,4,6-tri-n-propyl-2,4,6-trioxo-1,3,5,2,4,6-trioxatriphosphorinane*

### *Toxicity to fish*

LC50 Danio rerio (zebra fish): > 100 mg/l; 96 h (External MSDS)

### *Toxicity to daphnia and other aquatic invertebrates*

EC50 Daphnia magna (Water flea): > 100 mg/l; 48 h (External MSDS)

### *Toxicity to algae*

IC50 Desmodesmus subspicatus (green algae): > 100 mg/l; 72 h (External MSDS)

### *Toxicity to bacteria*

IC50 Bacteria: > 1,000 mg/l; 3 h (External MSDS)

### *Biodegradability*

1.9 %; 28 d

OECD Test Guideline 301A

Not readily biodegradable.

### *Partition coefficient: n-octanol/water*

log Pow: 0.49

(External MSDS)

## *dipropyldiphosphonic acid*

No information available.

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## SECTION 13. Disposal considerations

The information presented only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. Disposal should be in accordance with applicable regional, national and local laws and regulations.

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## SECTION 14. Transport information

### Land transport (DOT)

UN number

UN 2924

Proper shipping name

FLAMMABLE LIQUID, CORROSIVE, N.O.S. ( CONT. METHYLTETRAHYDROFURAN, PROPYLPHOSPHONIC CYCLIC ANHYDRIDE)

Class

3 ( 8)

Packing group

II

Environmentally hazardous

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### Air transport (IATA)

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**UN number** UN 2924  
**Proper shipping name** FLAMMABLE LIQUID, CORROSIVE, N.O.S. ( CONT. METHYLTETRAHYDROFURAN, PROPYLPHOSPHONIC CYCLIC ANHYDRIDE)  
**Class** 3 ( 8)  
**Packing group** II  
**Environmentally hazardous** --  
**Special precautions for user** no

### Sea transport (IMDG)

**UN number** UN 2924  
**Proper shipping name** FLAMMABLE LIQUID, CORROSIVE, N.O.S. ( CONT. METHYLTETRAHYDROFURAN, PROPYLPHOSPHONIC CYCLIC ANHYDRIDE)  
**Class** 3 ( 8)  
**Packing group** II  
**Environmentally hazardous** --  
**Special precautions for user** yes  
**EmS** F-E S-C  
**Segregation Group** 0001 Acids

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## SECTION 15. Regulatory information

### United States of America

#### OSHA Hazards

Flammable Liquid  
Corrosive to eyes  
Corrosive by inhalation.

This information is based on 29 CFR 1910.1200 criteria prior to adoption of the GHS, and may deviate from the GHS information on the label and in section 2.

#### SARA 311/312 Hazards

Fire Hazard  
Acute Health Hazard

#### SARA 313

SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

#### SARA 302

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

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## Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.

This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.

## DEA List I

Not listed

## DEA List II

Not listed

## US State Regulations

### Massachusetts Right To Know

#### *Ingredients*

Tetrahydro-2-methylfuran

### Pennsylvania Right To Know

#### *Ingredients*

Tetrahydro-2-methylfuran

2,4,6-tri-n-propyl-2,4,6-trioxo-1,3,5,2,4,6-trioxatriphosphorinane

dipropyldiphosphonic acid

### New Jersey Right To Know

#### *Ingredients*

Tetrahydro-2-methylfuran

2,4,6-tri-n-propyl-2,4,6-trioxo-1,3,5,2,4,6-trioxatriphosphorinane

dipropyldiphosphonic acid

### California Prop 65 Components

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

## Notification status

TSCA:

Not Listed on TSCA inventory. For Research and Development Use only. Not For Manufacturing or Commercial Purposes.

#### *Ingredients*

2,4,6-tri-n-propyl-2,4,6-trioxo-1,3,5,2,4,6-trioxatriphosphorinane

dipropyldiphosphonic acid

propylphosphonic acid

DSL:

This product contains one or several components that are not on the Canadian DSL nor NDSL.

#### *Ingredients*

Tetrahydro-2-methylfuran

dipropyldiphosphonic acid

propylphosphonic acid

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## SECTION 16. Other information

### Training advice

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Provide adequate information, instruction and training for operators.

### Full text of H-Statements referred to under sections 2 and 3.

H225	Highly flammable liquid and vapor.
H314	Causes severe skin burns and eye damage.
H335	May cause respiratory irritation.

### Key or legend to abbreviations and acronyms used in the safety data sheet

Used abbreviations and acronyms can be looked up at [www.wikipedia.org](http://www.wikipedia.org).

Revision Date 08/21/2013

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The information contained herein is based on the present state of our knowledge. It characterizes the product with regard to appropriate safety precautions. It does not represent a warranty of any product properties and we assume no liability for any loss or injury which may result from the use of this information. Users should conduct their own investigations to determine the suitability of the information.

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