

according to Regulation (EC) No 1907/2006

Triethylcitrat

Revision date: 05.07.2019

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SECTION 1: Identification of the substance/mixture and of the company/undertaking**1.1. Product identifier**

Triethylcitrat

Product code:

ORA-A1006

Further trade names

Substance name: Triethyl citrate

CAS No: 77-93-0

EC No: 201-070-7

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

Laboratory chemicals

Equipment maintenance

1.3. Details of the supplier of the safety data sheet

Company name:	KERN & SOHN GmbH	
Street:	Ziegelei 1	
Place:	D-72336 Balingen-Frommern	
Telephone:	+49 (0)7433 9933 0	Telefax: +49 (0)7433 9933 149
e-mail:	info@kern-sohn.com	
Contact person:	Daniel Junger	Telephone: +49 (0)7433 9933 155
e-mail:	daniel.junger@kern-sohn.com	
Internet:	www.kern-sohn.com	

1.4. Emergency telephone number:

GIZ-Nord, Göttingen, Germany +49 551 19240 (24h/7d)

SECTION 2: Hazards identification**2.1. Classification of the substance or mixture****Regulation (EC) No. 1272/2008**

This substance is not classified as hazardous in accordance with Regulation (EC) No. 1272/2008.

2.2. Label elements**Additional advice on labelling**

Labelling according to Regulation (EC) No. 1272/2008 [CLP]: none

2.3. Other hazards

This substance does not meet the PBT/vPvB criteria of REACH, Annex XIII.

Vapours can form explosive mixtures with air.

SECTION 3: Composition/information on ingredients**3.1. Substances**

Sum formula:	C ₁₂ H ₂₀ O ₇
Molecular weight:	276,29 g/mol

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Hazardous components

CAS No	Chemical name			Quantity
	EC No	Index No	REACH No	
	GHS Classification			
77-93-0	Triethyl citrate			100 %
	201-070-7			

Full text of H and EUH statements: see section 16.

SECTION 4: First aid measures**4.1. Description of first aid measures****General information**

First aider: Pay attention to self-protection!
If unconscious place in recovery position and seek medical advice.

When in doubt or if symptoms are observed, get medical advice.

After inhalation

Provide fresh air. Put victim at rest, cover with a blanket and keep warm. If breathing is irregular or stopped, administer artificial respiration. If experiencing respiratory symptoms: Get medical advice/attention.

After contact with skin

After contact with skin, wash immediately with plenty of water and soap. Take off immediately all contaminated clothing and wash it before reuse. In case of skin reactions, consult a physician.

After contact with eyes

Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. In case of troubles or persistent symptoms, consult an ophthalmologist.

After ingestion

Observe risk of aspiration if vomiting occurs. Rinse mouth immediately and drink plenty of water. Never give anything by mouth to an unconscious person or a person with cramps. Get medical advice/attention if you feel unwell.

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

No information available.

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

First Aid, decontamination, treatment of symptoms.

SECTION 5: Firefighting measures**5.1. Extinguishing media****Suitable extinguishing media**

Co-ordinate fire-fighting measures to the fire surroundings.
Carbon dioxide (CO₂), Extinguishing powder, Water spray jet.
In case of major fire and large quantities: Water spray jet, alcohol resistant foam.

Unsuitable extinguishing media

Full water jet

5.2. Special hazards arising from the substance or mixture

Vapours can form explosive mixtures with air. In case of fire may be liberated: Carbon monoxide, Carbon dioxide (CO₂), Gases/vapours, toxic.

5.3. Advice for firefighters

In case of fire: Wear self-contained breathing apparatus. Full protective suit.

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Additional information

Use water spray jet to protect personnel and to cool endangered containers. Suppress gases/vapours/mists with water spray jet. Collect contaminated fire extinguishing water separately. Do not allow entering drains or surface water.

SECTION 6: Accidental release measures**6.1. Personal precautions, protective equipment and emergency procedures**

Provide adequate ventilation. Do not breathe gas/fumes/vapour/spray. Avoid contact with skin, eyes and clothes. Use personal protection equipment. Remove all sources of ignition. Evacuate area. Remove persons to safety.

6.2. Environmental precautions

Do not allow to enter into surface water or drains. Do not allow to enter into soil/subsoil. In case of gas escape or of entry into waterways, soil or drains, inform the responsible authorities.

6.3. Methods and material for containment and cleaning up

Absorb with liquid-binding material (e.g. sand, diatomaceous earth, acid- or universal binding agents). Collect in closed and suitable containers for disposal. Treat the recovered material as prescribed in the section on waste disposal.

Clean contaminated articles and floor according to the environmental legislation.

6.4. Reference to other sections

Safe handling: see section 7

Personal protection equipment: see section 8

Disposal: see section 13

SECTION 7: Handling and storage**7.1. Precautions for safe handling****Advice on safe handling**

Provide adequate ventilation. Do not breathe gas/fumes/vapour/spray. Avoid contact with skin, eyes and clothes. Use personal protection equipment. Avoid: aerosol or mist formation.

Advice on protection against fire and explosion

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take precautionary measures against static discharges. Vapours can form explosive mixtures with air.

7.2. Conditions for safe storage, including any incompatibilities**Requirements for storage rooms and vessels**

Keep/Store only in original container. Keep container tightly closed and in a well-ventilated place. Store in a cool dry place. Do not allow to enter into soil/subsoil.

Hints on joint storage

Do not store together with: Food and feedingstuffs, Oxidising agent, strong

Further information on storage conditions

Keep away from heat. Protect against direct sunlight.

7.3. Specific end use(s)

Laboratory chemicals

Equipment maintenance

SECTION 8: Exposure controls/personal protection**8.1. Control parameters**

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DNEL/DMEL values

CAS No	Substance		
DNEL type	Exposure route	Effect	Value
77-93-0	Triethyl citrate		
Consumer DNEL, long-term	oral	systemic	12,5 mg/kg bw/day
Worker DNEL, long-term	dermal	systemic	20,8 mg/kg bw/day
Consumer DNEL, long-term	dermal	systemic	12,5 mg/kg bw/day
Worker DNEL, long-term	inhalation	systemic	73,5 mg/m ³
Consumer DNEL, long-term	inhalation	systemic	28,8 mg/m ³

PNEC values

CAS No	Substance	
Environmental compartment	Value	
77-93-0	Triethyl citrate	
Freshwater sediment	0,124 mg/kg	
Marine sediment	0,018 mg/kg	
Secondary poisoning	222,22 mg/kg	

Additional advice on limit values

To date, no national critical limit values exist.

8.2. Exposure controls**Appropriate engineering controls**

Provide adequate ventilation as well as local exhaust at critical locations.

Protective and hygiene measures

Remove contaminated, saturated clothing immediately. Draw up and observe skin protection programme. Wash hands and face before breaks and after work and take a shower if necessary. When using do not eat, drink, smoke, sniff. Do not breathe gas/fumes/vapour/spray. Keep away from food, drink and animal feedingstuffs. Avoid contact with skin, eyes and clothes.

Eye/face protection

Filling and transfer: Wear eye/face protection.

Hand protection

Wear protective gloves.

Unsuitable material: Natural fibres (e.g. cotton), Leather articles

When handling with chemical substances, protective gloves must be worn with the CE-label including the four control digits. The quality of the protective gloves resistant to chemicals must be chosen as a function of the specific working place concentration and quantity of hazardous substances. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves. Breakthrough times and swelling properties of the material must be taken into consideration.

Skin protection

Use of protective clothing.

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Respiratory protection

In case of inadequate ventilation wear respiratory protection. Respiratory protection necessary at: Vapour, aerosol or mist formation.

short-term:

Filtering device (full mask or mouthpiece) with filter: A (Colour: brown; Initial boiling point and boiling range: > 65 °C)

long-term:

Self-contained respirator (breathing apparatus) (DIN EN 133)

Environmental exposure controls

Do not allow to enter into surface water or drains. Do not allow to enter into soil/subsoil. In case of gas escape or of entry into waterways, soil or drains, inform the responsible authorities.

SECTION 9: Physical and chemical properties**9.1. Information on basic physical and chemical properties**

Physical state:	Liquid	
Colour:	colourless, clear	
Odour:	characteristic	
pH-Value:		not determined

Changes in the physical state

Melting point:	< -40 °C
Initial boiling point and boiling range:	approx. 286 °C
Flash point:	> 155 °C

Flammability

Solid:	not applicable
Gas:	not applicable

Explosive properties

The product is not: Explosive.

Vapours can form explosive mixtures with air.

Lower explosion limits:	not determined
Upper explosion limits:	not determined
Ignition temperature:	not determined

Auto-ignition temperature

Solid:	not applicable
Gas:	not applicable

Decomposition temperature:	not determined
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Oxidizing properties

Not oxidising.

Vapour pressure: (at 20 °C)	0,0025 hPa
Density (at 20 °C):	approx. 1,1399 g/cm ³
Water solubility: (at 20 °C)	58,1 g/L

Solubility in other solvents

not determined

Partition coefficient:	1,17
Viscosity / dynamic:	not determined

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Viscosity / kinematic: (at 20 °C)	32,17 mm ² /s
Vapour density:	not determined
Evaporation rate:	not determined

9.2. Other information

Odour threshold: not determined

SECTION 10: Stability and reactivity**10.1. Reactivity**

No hazardous reaction when handled and stored according to provisions.

10.2. Chemical stability

The product is stable under storage at normal ambient temperatures.

10.3. Possibility of hazardous reactions

Vapours can form explosive mixtures with air.

Reaction with: Oxidising agent, strong

10.4. Conditions to avoid

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Protect against direct sunlight. Take precautionary measures against static discharges.

10.5. Incompatible materials

Oxidising agent, strong

10.6. Hazardous decomposition products

Gases/vapours, toxic

Gases/vapours, flammable

In case of fire may be liberated: Carbon monoxide, Carbon dioxide (CO₂)**SECTION 11: Toxicological information****11.1. Information on toxicological effects****Acute toxicity**

Based on available data, the classification criteria are not met.

CAS No	Chemical name				
	Exposure route	Dose	Species	Source	Method
77-93-0	Triethyl citrate				
	oral	LD50 mg/kg	5900	Rat	Manufacturer
	dermal	LD50 mg/kg	> 5000	Rabbit	Manufacturer

Irritation and corrosivity

Based on available data, the classification criteria are not met.

Sensitising effects

Based on available data, the classification criteria are not met.

Carcinogenic/mutagenic/toxic effects for reproduction

Based on available data, the classification criteria are not met.

STOT-single exposure

Based on available data, the classification criteria are not met.

STOT-repeated exposure

Based on available data, the classification criteria are not met.

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Aspiration hazard

Based on available data, the classification criteria are not met.

SECTION 12: Ecological information**12.1. Toxicity**

The product is not: Ecotoxic.

CAS No	Chemical name					
	Aquatic toxicity	Dose	[h] [d]	Species	Source	Method
77-93-0	Triethyl citrate					
	Acute fish toxicity	LC50 mg/l	112,02	96 h	Piscis	Manufacturer Quantitative structure-activity relationship (QSAR)
	Acute algae toxicity	ErC50 mg/l	> 100	72 h	Pseudokirchneriella subcapitata	Manufacturer OECD 201
	Acute crustacea toxicity	EC50 mg/l	> 100	48 h	Daphnia magna (Big water flea)	Manufacturer OECD 202
	Algae toxicity	NOEC mg/l	> 100	3 d	Pseudokirchneriella subcapitata	Manufacturer OECD 201
	Crustacea toxicity	NOEC mg/l	> 100	2 d	Manufacturer	Manufacturer OECD 202

12.2. Persistence and degradability

The product is: Readily biodegradable (according to OECD criteria).

CAS No	Chemical name			
	Method	Value	d	Source
	Evaluation			
77-93-0	Triethyl citrate			
	OECD 301F	77 %	28	Manufacturer
	Readily biodegradable (according to OECD criteria).			

12.3. Bioaccumulative potential

Based on the n-octanol/water partition coefficient significant accumulation in organisms is not expected.

Partition coefficient n-octanol/water

CAS No	Chemical name	Log Pow
77-93-0	Triethyl citrate	1,17

12.4. Mobility in soil

No data available

12.5. Results of PBT and vPvB assessment

This substance does not meet the PBT/vPvB criteria of REACH, Annex XIII.

12.6. Other adverse effects

No information available.

Further information

Do not allow to enter into surface water or drains. Do not allow to enter into soil/subsoil.

AOX: not relevant (DIN EN ISO 9562)

Directive 2006/11/EC on pollution caused by certain dangerous substances discharged into the aquatic environment:

Contains: none Heavy metals

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SECTION 13: Disposal considerations**13.1. Waste treatment methods****Advice on disposal**

Do not allow to enter into surface water or drains. Do not allow to enter into soil/subsoil. Dispose of waste according to applicable legislation.

The allocation of waste identity numbers/waste descriptions must be carried out according to the EEC, specific to the industry and process. The waste code has to be identified in agreement with the disposal company or the competent authority.

Contaminated packaging

Non-contaminated packages may be recycled. Handle contaminated packages in the same way as the substance itself.

SECTION 14: Transport information**Land transport (ADR/RID)**

14.1. UN number:	No dangerous good in sense of this transport regulation.
14.2. UN proper shipping name:	No dangerous good in sense of this transport regulation.
14.3. Transport hazard class(es):	No dangerous good in sense of this transport regulation.
14.4. Packing group:	No dangerous good in sense of this transport regulation.

Inland waterways transport (ADN)

14.1. UN number:	No dangerous good in sense of this transport regulation.
14.2. UN proper shipping name:	No dangerous good in sense of this transport regulation.
14.3. Transport hazard class(es):	No dangerous good in sense of this transport regulation.
14.4. Packing group:	No dangerous good in sense of this transport regulation.

Marine transport (IMDG)

14.1. UN number:	No dangerous good in sense of this transport regulation.
14.2. UN proper shipping name:	No dangerous good in sense of this transport regulation.
14.3. Transport hazard class(es):	No dangerous good in sense of this transport regulation.
14.4. Packing group:	No dangerous good in sense of this transport regulation.

Air transport (ICAO-TI/IATA-DGR)

14.1. UN number:	No dangerous good in sense of this transport regulation.
14.2. UN proper shipping name:	No dangerous good in sense of this transport regulation.
14.3. Transport hazard class(es):	No dangerous good in sense of this transport regulation.
14.4. Packing group:	No dangerous good in sense of this transport regulation.

14.5. Environmental hazards

ENVIRONMENTALLY HAZARDOUS: no

14.6. Special precautions for user

No information available.

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

not applicable

SECTION 15: Regulatory information**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture****EU regulatory information**

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Information according to 2012/18/EU (SEVESO III): Not subject to 2012/18/EU (SEVESO III)

Additional information

Regulation (EC) No. 1005/2009 on substances that lead to the depletion of the ozone layer: not relevant

Regulation (EC) No 850/2004 [POP-Regulation]: not relevant

National regulatory information

Water contaminating class (D): 1 - slightly water contaminating

15.2. Chemical safety assessment

For this substance a chemical safety assessment has not been carried out.

SECTION 16: Other information

Abbreviations and acronyms

CLP: Classification, labelling and Packaging
 REACH: Registration, Evaluation and Authorization of Chemicals
 GHS: Globally Harmonised System of Classification, Labelling and Packaging of Chemicals
 UN: United Nations
 CAS: Chemical Abstracts Service
 DNEL: Derived No Effect Level
 DMEL: Derived Minimal Effect Level
 PNEC: Predicted No Effect Concentration
 ATE: Acute toxicity estimate
 LC50: Lethal concentration, 50%
 LD50: Lethal dose, 50%
 LL50: Lethal loading, 50%
 EL50: Effect loading, 50%
 EC50: Effective Concentration 50%
 ErC50: Effective Concentration 50%, growth rate
 NOEC: No Observed Effect Concentration
 BCF: Bio-concentration factor
 PBT: persistent, bioaccumulative, toxic
 vPvB: very persistent, very bioaccumulative
 AOX: Adsorbable Organic Halides
 ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
 RID: Regulations concerning the international carriage of dangerous goods by rail
 ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (Accord européen relatif au transport international des marchandises dangereuses par voies de navigation intérieures)
 IMDG: International Maritime Code for Dangerous Goods
 EmS: Emergency Schedules
 MFAG: Medical First Aid Guide
 IATA: International Air Transport Association
 ICAO: International Civil Aviation Organization
 MARPOL: International Convention for the Prevention of Marine Pollution from Ships
 IBC: Intermediate Bulk Container
 SVHC: Substance of Very High Concern
 For abbreviations and acronyms, see table at <http://abbrev.esdscom.eu>

Further Information

The information is based on present level of our knowledge. It does not, however, give assurances of product properties and establishes no contract legal rights. The receiver of our product is singularly responsible for adhering to existing laws and regulations.



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