

Safety Data Sheet

1. IDENTIFICATION

Product Name:	Triethyl Citrate
Other Names:	TEC
Recommended Use:	Triethyl citrate is used as solvent, diluent and fixative by perfumers. It is well accepted as an active ingredient in deodorants. In pharmaceutical applications Triethyl citrate contributes as plasticiser to the performance of enteric-coated tablets.
Supplier:	Global Chemie ASCC Limited
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Telephone:	+66 2324 6888
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2. HAZARDS IDENTIFICATION

Health Hazard Classification

Classification according to Regulation (EC) No 1272/2008. The substance is not classified according to the GHS criteria.

Hazardous Categories

No data available.

Hazardous Statement

No data available.

GHS Pictograms

No data available.

Hazard Statements

No data available.

Precautionary Statements

No data available

Response

No data available.

Storage

No data available.

Disposal

P501: Disposal should be in accordance with applicable regional, national, and local laws and regulations. Local regulations may be more stringent than regional or national requirements and must be complied.

Signal Word No signal word

3. COMPOSITION: Information on Ingredients

Chemical Ingredient	CAS No.	UN No.	Proportion (%v/v)
Triethyl Citrate	77-93-0	-	> 99.0

Molecular Formular: $C_{12}H_{20}O_7$

Molecular Weight: 276.29 g/mol

4. FIRST AID MEASURES

For advice, contact Ramathibodi Poison Center (Phone: 1367) or a doctor.

Ingestion

Do not induce vomiting; Do not eat milk and castor oil, transport to nearest medical facility for additional treatment.

Eye Contact

Immediately flush eyes with large amounts of water for at least 10 minutes while holding eyelids open. Transport to the nearest medical facility for additional treatment.

Skin Contact

Remove contaminated clothing. Immediately flush skin with large amounts of water for at least 15 minutes, and follow by washing with soap and water if available.

Inhalation

Remove to fresh air. If the victim has difficulty breathing or tightness of the chest, give 100% oxygen with rescue breathing or CPR as required and transport to the nearest medical facility.

First Aid facilities

Provide eye baths and safety showers.

Medical Attention

Treat according to symptoms. Avoid gastric lavage: risk of aspiration of product to the lungs with the potential to cause chemical pneumonitis.

5. FIRE FIGHTING MEASURES

Shut off product that may 'fuel' a fire if safe to do so. Allow trained personnel to attend a fire in progress, providing firefighters with this Safety Data Sheet. Prevent extinguishing media from escaping to drains and waterways.

Suitable extinguishing media

Water spray or fog, Dry chemical powder and Carbon dioxide.

Hazards from combustion products

Formation of toxic gases is possible during heating or in case of fire.

Precautions for fire fighters and special protective equipment

Wear self-contained respiratory protective device. Use personal protective equipment.

6. ACCIDENTAL RELEASE MEASURES**Emergency Procedures**

Prevent fluid from escaping to drains and waterways. Contain leaking packaging in a containment drum. Prevent vapours from building up in confined areas. Ensure that drain valves are closed at all times. Clean up and report spills immediately.

Methods and materials for containment**Protective Measures**

- Observe all relevant local and international regulations.
- Avoid contact with spilled or released material. Immediately remove all contaminated clothing. For guidance on selection of personal protective equipment see chapter 8 this Material Safety Data Sheet. Shut off leaks, if possible, without personal risks. Remove all possible sources of ignition in the surrounding area. Prevent from spreading or entering drains, ditches, or rivers by using sand, earth, or other appropriate barriers.
- Take precautionary measures against static discharge. Ensure electrical continuity by bonding and grounding (earthing) all equipment.

Clean-Up Methods

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|--------------------------------|--|
| ♦ Small spillage
(< 200 LT) | : Transfer by mechanical means to a labelled, sealable container for product recovery or safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely. |
| ♦ large spillage
(> 200 LT) | : Transfer by mechanical means such as vacuum truck to a salvage tank for recovery or safe disposal. Do not flush away residues with water. Retain as contaminated waste. Allow |

residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.

7. HANDLING AND STORAGE

Precautions for safe handling

Avoid contact with skin, eyes, and clothing. Do not breathe vapours. Extinguish any naked flame. Remove ignition sources. Avoid sparks. Do not smoke. The vapour is heavier than air spreads along the ground and distant ignition is possible. Ensure electrical continuity by bonding and grounding (earthing) all equipment. Do not use compressed air for filling, discharging, or handling operations. Handle and open container with care in well-ventilated area. Do not empty into drains.

Conditions for safe storage

Must be stored in a diked (bunded) well-ventilated area, away from sunlight, ignition sources and other sources of heat. Bulk storage tanks should be diked (bunded). Keep away from aerosols, flammables, oxidizing agents, corrosives. Storage Temperature: Ambient.

Incompatible materials

Strong oxidizing agents.

Recommended Materials

For containers, or container linings use mild steel, stainless steel.

Product Transfer

No data available.

Additional Advice

No data available.

8. EXPOSURE CONTROLS: PERSONAL PROTECTION

National Exposure Standards

Occupational Exposure Limits: No data available.

Engineering Controls

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapours below their respective threshold limit value.

Personal Protective Equipment

Respiratory Protection: Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.

Eye Protection: Chemical splash goggles (chemical monologues).

Skin/ Body Protection: Use protective clothing which is chemical resistant to this material. Safety shoes and boots should also be chemical resistant.

Hand Protection: Butyl rubber gloves, Nature rubber gloves, Neoprene rubber gloves, Nitrile rubber gloves.

9. PHYSICAL AND CHEMICAL PROPERTIES

Property	Unit of Measurement	Typical Value
Appearance	-	Colorless Liqid
Odour	-	characteristic odour
pH	-	No data available
Boiling point	°C	286.8
Melting point	°C	< -40
Flash point	°C	155
Flammability	-	Not flammable

Property	Unit of Measurement	Typical Value
Autoignition Temperature	°C	No data available
Decomposition Temperature	°C	No data available
Lower/Upper Flammability Limits	%V	No data available
Density @ 20°C	g/cm ³	1.140
Specific Gravity @ 25°C	-	1.135-1.139
Viscosity @ 25°C	cSt.s	35
Vapor pressure	kPa	No data available
Vapor density	kPa (Air = 1)	No data available
Evaporation Rate	(n-Butyl acetate = 1)	No data available
Water Solubility	g/L	58.1
Solubility in other solvents Partition coefficient	(n-octanol/water)	1.17
Coefficient of Thermal Expansion	per Deg °C	No data available
Particle Characteristic	-	No data available

The values listed are indicative of this product's physical and chemical properties. For a full product specification, please consult the Product Data Sheet.

10. STABILITY AND REACTIVITY

Chemical Stability

Stable under normal conditions.

Conditions to avoid

No further relevant information available.

Hazardous decomposition products

Formation of toxic gases is possible during heating or in case of fire.

Hazardous reactions

No data available.

Hazardous Polymerisation

No data available.

Materials to Avoid

Avoid contact with strong oxidizing agents.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

- ♦ LD₅₀ Acute oral toxicity : >5,900 mg/kg (rat)
- ♦ LD₅₀ Acute dermal toxicity : >5,000 mg/kg (rabbit)
- ♦ LC₅₀ Acute Inhalation Toxicity : >1,300-3,500 mg/l (rat)

Eye Contact

No irritating effect.

Skin Contact

Triethyl citrate did not irritate intact or abraded rabbit skin.

Respiratory Irritation

Inhalation of vapours or mists may cause irritation to the respiratory system.

Carcinogenicity
The substance does not exhibit any CMR effects.

Additional toxicological information:
When used and handled according to specifications, the product does not have any harmful effects to our experience and the information provided to us. The substance is not subject to classification according to the latest version of the EU lists.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Acute Toxicity

♦ Daphnia magna	Low toxicity	EC50 > 100 mg/l (48h)
♦ Pseudokirchneriella subcapitata	Low toxicity	EC50 > 100 mg/l (72h)
♦ Fish	Low toxicity	EC50 = 112.02 mg/l (96h)

Persistence/ degradability
Within 28 days, a mean degradation of 78 % (ThODNH4) was determined for the substance triethyl citrate. Therefore, the substance is considered to be readily biodegradable.

Mobility
The Koc of the substance was calculated to be 21.02 L/kg using the MCI method of KOCWIN program (v2.00) indicating that the substance has mobility in soil.

Bioaccumulation
A Bioconcentration Factor (BCF) of 2.75 L/kg wet-wt was calculated for the substance triethyl citrate. The substance is not expected to bioaccumulate.

13. DISPOSAL CONSIDERATIONS

Disposal Methods

Material Disposal
Recover or recycle if possible. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classifications and disposal methods in compliance with applicable regulations.

Container Disposal
Drain container thoroughly. After draining, vent in a safe place away from sparks and fire before handling the product or containers. Residues may cause an explosion hazard. Do not puncture, cut or weld uncleaned drums. Send to drum recovered or metal reclaimer.

Local Legislation
Disposal should be in accordance with applicable regional, national, and local laws and regulations. Local regulations may be more stringent than regional or national requirements and must be complied.

14. TRANSPORT INFORMATION

Road and Rail Transport		Marine Transport		Air Transport	
UN No.	Not Regulated	UN No.	Not Regulated	UN No.	Not Regulated
Class/Item	Not Regulated	Class/Item	Not Regulated	Class/Item	Not Regulated
Hazard Symbol	Not Regulated	Hazard Symbol	Not Regulated	Hazard Symbol	Not Regulated
Proper Shipping Name	Not Regulated	Proper Shipping Name	Not Regulated	Proper Shipping Name	Not Regulated
Packing Group	Not Regulated	Packing Group	Not Regulated	Packing Group	Not Regulated
		Marine Pollutant	Not Regulated		

15. REGULATORY INFORMATION

EC Label Name	: Triethyl citrate
EC Classification	: No data available
EINECS (EC)	: 201-070-7
EC Annex I Number	: No data available
MITI (Japan)	: No data available
Other	: None

US TSCA: Listed

Japan MITI: Listed

New Zealand (NZioC): Listed

Australian Inventory of Chemical Substances (AICS): Listed

Philippine Inventory of Chemicals and Chemical Substances (PICCS): Listed

China (IECSC): Listed

16. OTHER INFORMATION

National Fire Protection Association (USA)	: No data available
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SDS Distribution	: The information contained herein is based on our current knowledge of the underlying data and is intended to describe the product for the purpose of health, safety and environmental requirements only. No warranty of guarantee is expressed or implied regarding the accuracy of these data or the results to be obtained from the use of the product.
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Prepared By	: Quality Control Department / Global Chemie ASCC Limited
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Abbreviations:

(Regulations Concerning the International Transport of Dangerous Goods by Rail)

IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA) ICAO: International Civil Aviation Organisation

ICAO-TI: Technical Instructions by the "International Civil Aviation Organisation" (ICAO)

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road) IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

GHS: Globally Harmonised System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society) LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent.

References:

- Supplier Material Safety Data Sheets
- <http://chem.sis.nlm.nih.gov/chemidplus> (October 18)
- <http://hsis.ascc.gov.au/SearchHS.aspx> (October 18)
- Ecotoxicology data: http://cfpub.epa.gov/ecotox/quick_query.htm (October 18)
- *Sax's Dangerous Properties of Industrial Materials*, Richard J. Lewis Snr., pub. Canada (2000)

The information sourced for the preparation of this document was correct and complete at the time of writing to the best of the writer's knowledge. The document represents the commitment to the company's responsibilities surrounding the supply of this product, undertaken in good faith. This document should be taken as a safety guide for the product and its recommended uses but is in no way an absolute authority. Please consult the relevant legislation and regulations governing the use and storage of this type of product. No warranty and guarantee are expressed or implied regarding the accuracy of these data or the results to be obtained from the use of the product for further information, please contact Global Chemie ASCC Limited.