



SAFETY DATA SHEET

9-9/1 Soi G 12 WHA Eastern Industrial Estate (Map
Ta Phut), Pakomsongkrohraj Road, Map Ta Phut,
Muang Rayong, Rayong 21150
Tel. +66 3899 4000 Fax: +66 3897 7111

Trade name: TRIETHANOLAMINE 99%
Issued date : 1 July 2022

SDS No.004-1
Rev. 01

1. IDENTIFICATION OF THE SUBSTANCE OR MIXTURE AND OF THE COMPANY/UNDERTAKING

Product identifier:

Substance name: Triethanolamine

Synonyms: 2,2',2''-nitrilotriethanol, Ethanol, 2,2',2''-nitrilotris-, (2-Hydroxyethyl)amine, 2,2',2''-Trihydroxy-triethylamine

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

Relevant identified uses of the substance or mixture

Uses by workers in industrial settings;

Manufacturing of TEA. Formulation of products containing TEA. Industrial use resulting in manufacture of another substance. Processing aid for paper, textile, leather, Gas/water treatment. Use in metal working fluids, electroplating, detergents, cleaners and ink removers. Use as additive in plastic, e.g. rubber, a laboratory chemical, additive in fuel. Use of fuel. Use in wood protection formulations

Uses by professional workers;

Use as additive in concrete and cement. Processing aid for paper, textile, leather Use in metal working fluids, detergents, cleaners and ink removers. Use as additive in plastic, e.g. rubber, a laboratory chemical. Use of fuel

Uses by Consumers;

Use of concrete and cement. Use of fuel. Use in detergents and cleaners, wood protection formulations, personal care products.

Uses advised against;

None known

Details of the manufacturer of the safety data sheet

Address:

PTT Global Chemical Public Company Limited
9-9/1 Soi G12, Hemaraj Eastern Industrial Estate, Pakorn Songkhraorat Road,
Tambon Maptaphut, Amphoe Mueang Rayong, Rayong 21150, Thailand
Telephone no.+66(0)38994000 Ext. 7095
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Emergency telephone:

For medical advice (in Thailand):

+66(0)38994000 Ext. 7095

In case of transport incidents and other emergencies (advice in Thailand):

+66(0)38994000 Ext. 7095

Advice on Safety Data Sheet

Chatree.k@ptggroup.com

2. HAZARDS IDENTIFICATION

Classification of the substance or mixture

Classification information

Physical hazards Not classified.

Health hazards	Skin corrosion/irritation	Category 2
	Serious eye damage/eye irritation	Category 2A
	Skin sensitization	Category 1
	Specific target organ toxicity - repeated exposure	Category 2 (Liver, Kidney)

Environmental hazards Not classified.



GHS-labeling

Signal word Warning

Hazard statement

- H315 Causes skin irritation.
H319 Causes serious eye irritation.
H317 May cause an allergic skin reaction.
H373 May cause damage to organs (Liver, Kidney) through prolonged or repeated exposure.

Precautionary statement

- P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P264 Wash thoroughly after handling.
P272 Contaminated work clothing should not be allowed out of the workplace.
P280 Wear protective gloves and eye/face protection.
P302+P352 IF ON SKIN: Wash with plenty of soap and water.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P314 Get medical advice/attention if you feel unwell.
P321 Specific treatment (Wash areas of contact with water).
P332+P313 If skin irritation occurs: Get medical attention.



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P333+P313 If skin irritation or rash occurs: Get medical advice/attention.
P337+P313 If eye irritation persists: Get medical advice/attention.
P362 Take off contaminated clothing and wash before reuse.
P363 Wash contaminated clothing before reuse.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Substance / product identification

Substance name: 2,2',2''-nitrioltriethanol
CAS no.: 102-71-6
EC no.: 203-049-8
REACH no. : 01-2119486482-31-XXXX

Chemical name	Concentration (%)
1. Ethanol, 2,2',2''-nitrioltris-	99.00 %
2. Ethanol,2,2'-iminobis-	1.00 %

4. FIRST AID MEASURES

After inhalation:

If irritation, headache, nausea, or drowsiness occurs, remove to fresh air. Get medical attention if breathing become difficult or respiratory irritation persists.

After skin contact:

Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

After eye contact:

Immediately flush eyes with plenty of water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Get medical attention.

After swallowing:

If patient of conscious and can swallow, give two glasses of water (16 oz.), Include vomiting as directed by medical personnel. Do not include vomiting or give anything by mouth to an unconscious or convulsing person.

Other Instruction:

None



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5. FIRE-FIGHTING MEASURES

Suitable extinguishing media:

Use water spray, dry chemical, Foam or carbon dioxide to extinguish flames. Use water spray to cool fire-exposed containers. Water of foam may cause frothing.

Special risks:

None

Special protective equipment for fire-fighter:

Wear full protective clothing and positive pressure breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

Remove persons to safety and ventilate area. Avoid breathing vapor, contacting with skin, eyes or clothing.

Environmental precautions

Prevent entry into sewer and waterways.

Methods and material for containment and cleaning up

Wear appropriate personal protective equipment, including appropriate respiratory protection. Contain spill if possible.

Wipe up or absorb on suitable material and shovel up.

7. HANDLING AND STORAGE

Handling:

Precautions for safe handling

Minimum feasible handling temperatures should be maintained. Eye wash and safety shower should be available nearly when this product is handled or used.

Storage:

Requirement for storage rooms and vessels

Always keep in containers of same material as the original one.

Proper material: iron, stainless steel, polyethylene

Further information on storage conditions

Periods of exposure to high temperatures should be minimized. Avoid directly contact with sunlight and higher temperature. Keep container tightly closed in a well-ventilated place. Water contamination should be avoided. Store above 724 oF (22 oC) to prevent crystallization.



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8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Exposure limit for the total product:

None established for product; refer to Section 2 for component exposure limits

Exposure controls:

Personal protective equipment:

Respiratory protection: Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generate and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contamination or oxygen content is unknown.

Eye /Face protection: Avoid eye contact. Chemical type goggles should be worn. Do not wear contact lenses

Skin protection: Workers should be wash exposed skin several times daily with soap and water. Soiled work clothing should be laundered or dry-cleaned.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form:	liquid
Color:	Clear colorless to slightly yellow liquid
Odor:	ammonia-like
pH value	11 (basic)
Melting point/freezing point	20.5 °C
Boiling temperature	336.1 °C at 1013.25 hPa
Flash point	179 °C
Flammable limits lower	1.3 %
upper	8.5 %
Vapor pressure (20 °C)	<0.0003 hPa at 21 °C
Specific gravity (20 °C)	1.125 g/cm ³ at 20 °C
Solubility in water(20 °C)	> 1000 g/l at 20 °C



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10. STABILITY AND REACTIVITY

Conditions to avoid

Heat.

This material may react violently with acids. This material incompatible with strong oxidizing agents. This material is corrosive to copper, zinc, aluminum and their alloys. Do not add or formulate with nitrites. Toxic levels of ammonia, combustion products of nitrogen, carbon dioxide, carbon monoxide, irritating aldehydes and ketones may be formed on burning in a limited air supply.

11. TOXICOLOGICAL INFORMATION

Acute toxicity

LD₅₀ (oral, rat): 6400 mg/kg bw (OECD Guideline 401).

LD₅₀ (dermal, rabbit): > 2000 mg/kg bw (OECD Guideline 402).

Inhalation, rat, vapour (whole body): LC0 (8 h): saturated TEA atmosphere (approximately 1.8 mg/m³) (OECD Guideline 403).

Irritation index estimation of irritation (species):

Skin(rabbit) : > 0.50 - 3.00/8.0 Slightly irritation

Eye irritation test (rabbit): 15.00 - 25.00/110 Slightly irritation

Skin Sensitization

Skin contact may cause an allergic skin reaction in a small proportion of individuals.

Did not cause allergic skin reactions when tested in guinea pigs.

STOT-single exposure

Triethanolamine has not been classified for STOT SE.

STOT-repeated exposure

Prolonged and repeat ingestion of Triethanolamine has caused kidney damage in laboratory animals.



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Triethanolamine Carcinogenicity:

The national Toxicology Program (NTP) has conducted a chronic (lifetime) dermal exposure study in rats and mice exposed to Triethanolamine (TEA). In this case, female rats dermally exposed to TEA concentrations of up to 250 milligrams (mg) of TEA per kilogram (kg) of body weight (mg/kg/day) did not show an increased incidence of tumors. However, male rats dermally exposed to TEA concentrations of 32 to 125 mg/kg/day showed a marginal increase in kidney tumors (renal tubule sell adenomas). Male mice dermally exposed to TEA concentrations of 200 to 2000 mg/kg/day showed a marginal increase in liver tumors (hepatocellular adenomas and hepatoblastomas). Female mice exposed to 100 to 1000 mg/kg/day showed an increase incidence of liver tumors (hepatocellular adenoma and carcinoma). In the study report, NTP has concluded that there is "no evidence: of cancer in female rats, "equivocal evidence" of kidney cancer in male rats, and due to infection of the study animals with *Helicobacter hepaticus* is a bacterial known to cause liver cancers in infected animals.

The NTP has sponsored a repeat study in mice that are believed to be free of *Helicobacter* infection. This study is currently underway.

Diethanolamine Carcinogenicity:

In a chronic (two years) exposure study, sponsored by the National Toxicology Program (NTP), rats and mice were dermally exposed to Diethanolamine (DEA). Both male and female mice showed an increased incidence of liver tumors, and male mice showed an increased incidence of kidney tumors. In contrast, male and female rats did not show any increased incidence of tumors. NTP concluded, using their standard classification scheme, that there is "no evidence" of cancer in male and female rats, and "clear evidence" of liver and kidney cancer in male mice and "clear evidence" of liver cancer in female mice.

The American Chemistry Council (ACC) alkanolamines Panel, with the cooperation of the NTP, investigated the conduct of this study and concluded that the experimental design of the study was seriously flawed in a number of areas. In addition, the results of the NTP study are not consistent with other scientific studies investigating the carcinogenic potential of DEA. The flawed experimental design as well as the inconsistency of the NTP mouse study results with other studies, have resulted in questions over the relevance of the NTP study to establish the risk of cancer in humans from exposures to DEA.

The ACC Alkanoamines Panel is currently sponsoring mechanistic research on DEA, investigating the role of non-genotoxic mechanisms of carcinogenicity as applied to the DEA exposures in the NTP study. Results from this research program indicate that mice administered DEA via dermal (and oral) routes of exposure had significantly lower levels of choline and phospholine. Other research has shown that rodents chronically fed choline deficient diets, resulting in a cholinephosphocholine deficiency, develop liver tumors. In addition, due to the known differences in metabolism between rodent and humans, rodents are expected to be far more sensitive to the effects of choline depletion than humans. Although additional research in this area is still underway, the results to date of our research program indicate that the tumors observed in the NTP mouse study resulted from a mechanism that is not relevant to humans



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Diethanolamine Developmental and Reproductive Toxicity:

Laboratory animal studies investigating the developmental toxicity of DEA have indicated that DEA

12. ECOLOGICAL INFORMATION

Aquatic toxic:

Short-term toxicity

Fish, Pimephales promelas, LC50 (96 h): 11800 mg/L. (APHA method).

Aquatic invertebrates, Ceriodaphnia dubia, EC50 (48 h): 609.88 mg/L (ASTM Designation E1192).

Algae (growth rate), Desmodesmus subspicatus , EC50 (72 h): 512 mg/L (German Industrial Standard DIN 38412 part 9).

Long-term toxicity

Aquatic invertebrates, Daphnia magna, NOEC (21 d): 16 mg/L (similar to OECD Guideline 211).

Mobility:

This product is not expected to selectively partition and absorb to soil or sediments.

Persistence and Biodegradability:

This product is not expected to bio-accumulate.

13. DISPOSAL CONSIDERATIONS

Waste disposal method:

This product has been evaluated for RCRA characteristics and does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes etc. may render the resulting materials hazardous.



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14. TRANSPORT INFORMATION

DOT:

Properly shipping name:

Not regulated for drums. For larger containers, consult MSDS and shipping papers for proper shipping description.

Hazard Class:

Hazardous chemical type 3 (Thai law)

Identification number:

Not regulated

Packing group:

Not regulated

Label required:



IMDG

Not regulated

ICAO

Not regulated

15. REGULATORY INFORMATION

International regulation:

TSCA Inventory Status :

This product, or its components, or are exempt from the Toxic Substance Control Act(TSCA) Chemical Substance



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Inventory

WHMIS classification:

Class D, Div 2, Subdiv B: Irritant

Canadian Inventory Status:

This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:

This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:

This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory status:

This product, or its components, are listed on or are exempt from the Japan Ministry of Economy, Trade and Industry (METI) inventory.

China Inventory status:

This product, or its components, are listed on or are exempt from the Inventory of Existing Chemical Substances in China (IECSC). The copyright of the Inventory of Existing Chemical Substances in China (IECSC) belongs to The Chemical Registration Center of SEPA.

Korea Inventory status:

This product, or its components, are listed on or are exempt from Korea Existing and Evaluated Chemical Substances (KECL) inventory.

New Zealand Inventory status:

This product, or its components, are listed on or are exempt from New Zealand Inventory of Chemicals (NZIoC).

Philippine Inventory status:



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This product, or its components, are listed on or are exempt from Philippine Inventory of Chemicals and Chemical Substances (PICCS).

16. OTHER INFORMATION

Do not add nitrites. This product contains amines which can combine with nitrites or other nitrosating agent to form nitrosamines. Many nitrosamines have been found to cause cancer in laboratory animals. A component of this product carries "SKIN" notation. "SKIN" notation indicates possible adverse health effects as result of absorption through the skin, mucous membranes, by contact with vapor, mist, spray or liquid. Appropriate measures should be taken to minimize contact.

Further information

The information is based on our current knowledge however it does not represent a guarantee of product properties nor does it create any legal obligation.