Date of issue: 2019/09/19
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Safety Data Sheet

Section 1. Identification of the substance/mixture and of the company/undertaking

Product identifier:
Product name: Tetraethylenepentamine
SDS No. : 7677E-3
Relevant identified uses of the substance or mixture and uses advised against
Research and Development
Details of the supplier of the safety data sheet
Manufacturer/Supplier: KISHIDA CHEMICAL CO., LTD.
Address: 3-1, Honmachibashi, Chuo-ku, Osaka, JAPAN
Division: Chemical Safety Management Department
Telephone number: +81-6-6946-8061
FAX: +81-6-6946-1607

Section 2. Hazards identification

GHS classification and label elements of the product
Classification of the substance or mixture
HEALTH HAZARDS
Acute toxicity (Dermal): Category 3
Skin corrosion/irritation: Category 1
Serious eye damage/eye irritation: Category 1
Skin sensitization: Category 1
ENVIRONMENT HAZARDS
Hazardous to the aquatic environment, short-term (acute): Category 1
Hazardous to the aquatic environment, long-term (chronic): Category 1
(Note) GHS classification without description: Not classified/Classification not possible
Label elements

Signal word: Danger
HAZARD STATEMENT
H311 Toxic in contact with skin
H314 Causes severe skin burns and eye damage
H317 May cause an allergic skin reaction
H410 Very toxic to aquatic life with long lasting effects
PRECAUTIONARY STATEMENT
Prevention
P273 Avoid release to the environment.
P260 Do not breathe dust/fume/gas/mist/vapors/spray.
P264 Wash contaminated parts thoroughly after handling.
P272 Contaminated work clothing should not be allowed out of the workplace.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
Response
P391 Collect spillage.

P310 Immediately call a POISON CENTER/doctor/physician.
P312 Call a POISON CENTER/doctor/physician if you feel unwell.
P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P333 + P313 If skin irritation or rash occurs: Get medical advice/attention.
P363 Wash contaminated clothing before reuse.
P361 + P364 Take off immediately all contaminated clothing and wash it before reuse.
P362 + P364 Take off contaminated clothing and wash it before reuse.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

Storage

P405 Store locked up.

Disposal

P501 Dispose of contents/container in accordance with local/national regulation.

Specific adverse human health effects

See "11. Toxicological Information".

Section 3. Composition/information on ingredients

Mixture/Substance selection:

Substance

Ingredient name	Content (%)	CAS No.	ENCS	Chemical formula
Amines, polyethylenepoly-, tetraethylenepentamine fraction	≧90	90640-66-7	2-162; 7-5	C8H23N5

Note : The figures shown above are not the specifications of the product.

Supplementary information concerning ingredients

Tetraethylenepentamine 50% (CAS No.112-57-2)

Impurities

Amines, polyethylenepoly-, triethylenetetramine fraction 1.3% (CAS No.90640-67-8)
Triethylenetetramine 0.60% (CAS No.112-24-3)
Pentaethylenehexamine 1.0-8.0% (CAS No.-)

Section 4. First-aid measures

Descriptions of first-aid measures

IF INHALED

Remove person to fresh air and keep comfortable for breathing.
Call a POISON CENTER/doctor/physician if you feel unwell.

IF ON SKIN

Take off immediately all contaminated clothing. Rinse skin with water or shower.
Wash with plenty of soap and water.
If skin irritation or rash occurs: Get medical advice/attention.

IF IN EYES

Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

If eye irritation persists: Get medical advice/attention.

IF SWALLOWED

Rinse mouth.

Do NOT induce vomiting.

Call a POISON CENTER/doctor/physician if you feel unwell.

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

Use appropriate extinguishing media suitable for surrounding facilities.

In case of fire, use spraying loaded liquid, foam (water-soluble liquid: alcohol-resistant foam), inactive gases, dry powder, dry sand to extinguish.

*Fire Service Act Group 4 Hazardous Materials

Unsuitable extinguishing media

Indoor Fire Plug System or Outdoor Fire Plug System

Sprinkler System

Dry Chemical Extinguishing System-Others (except for phosphates etc., Hydrogen Carbonates etc.)

Fire Extinguisher Discharging Jet Water/Spraying Water

Fire Extinguisher Discharging Jet Loaded Liquid

Fire Extinguisher Discharging Dry Extinguishing agents-Others (except for phosphates etc., Hydrogen Carbonates etc.)

Water Bucket or Water Tank

*Cabinet Order Concerning the Control of Hazardous Materials (Attached Table 5) Group 4 Hazardous Materials

Specific hazards arising from the substance or mixture

Fire may produce irritating, corrosive and/or toxic gases.

Runoff from fire control or dilution water may cause pollution.

See "10.Stability and Reactivity".

Advice for firefighters

Specific fire-fighting measures

Evacuate non-essential personnel to safe area.

Special protective equipment and precautions for fire-fighters

Wear fire resistant or flame retardant clothing.

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

Firefighters should wear self-contained breathing apparatus with a full facepiece operated in the positive pressure mode.

Section 6. Accidental release measures

Personnel precautions, protective equipment and emergency procedures

Keep unauthorized personnel away.

Ventilate area until material pick up is complete.

Wear proper protective equipment.

Environmental precautions

Prevent spills from entering sewers, watercourses, low areas or rivers. To be careful not discharged to the environment without being properly handled waste water contaminated.

Methods and materials for containment and cleaning up

Absorb spill with inert material (dry sand, earth, et al), then place in a chemical waste

container.

Preventive measures for secondary accident

Collect spillage.

Section 7. Handling and storage

Precautions for safe handling

Preventive measures

(Exposure Control for handling personnel)

Do not breathe dust/fume/gas/mist/vapors/spray.

(Protective measures against fire and explosion)

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

(Exhaust/ventilator)

Exhaust/ventilator should be available.

(Safety treatments)

Avoid contact with skin.

Avoid contact with eyes.

Safety Measures

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

Wash hands et al thoroughly after handling.

When using do not eat, drink or smoke.

Any incompatibilities

See "10.Stability and Reactivity".

Advice on general occupational hygiene

Wash contaminated parts thoroughly after handling.

Contaminated work clothing should not be allowed out of the workplace.

Take off immediately all contaminated clothing and wash it before reuse.

Storage

Conditions for safe storage

Keep container tightly closed.

Store locked up. (P405)

Store in a cool, dry place. Do not store in direct sunlight.

Storage in accordance with local/national regulation.

Container and packaging materials for safe handling

Use closed unbreakable containers.

Section 8. Exposure controls/personal protection

Control parameters

Control value and concentration standard value are not available in ISHA.

Exposure controls

Appropriate engineering controls

Do not use in areas without adequate ventilation.

Eye wash station should be available.

Washing facilities should be available.

Individual protection measures

Recommend to use protective equipment in conformity with the standards.

Use appropriate protective equipment in accordance with local/national regulation.

Respiratory protection

Wear respiratory protection (dust-proof mask/gas mask). Select chemical cartridge corresponding to type of gases when using a gas mask.

Hand protection

Wear impervious protective glove.

Eye protection

Wear eye/face protection. Wear safety goggles in cases gas is generated.

Skin and body protection

Wear protective clothing.

Section 9. Physical and Chemical Properties

Information on basic physical and chemical properties

Physical state: Liquid
Color: Light yellow to yellow-red, clear
Odor: Ammonia odor
Melting point/Freezing point: -30℃
Boiling point or initial boiling point data is not available.
Boiling range data is not available.
Flammability (gases, liquids and solids) data is not available.
Lower and upper explosion limit/flammability limit data is not available.
Flash point: (Amines, polyethylenepoly-, tetraethylenepentamine fraction)171℃
Auto-ignition temperature data is not available.
Decomposition temperature data is not available.
pH data is not available.
Kinematic viscosity data is not available.
Solubility:

Solubility in water: Soluble
Solubility in solvent data is not available.

n-Octanol/water partition coefficient data is not available.
Vapor pressure data is not available.
Density and/or relative density: 0.10
Relative vapor density (Air=1) data is not available.
Particle characteristics data is not available.

Other information

Other information is not available.

Section 10. Stability and Reactivity

Reactivity

Not available.

Chemical stability

Stable under normal storage/handling conditions.

Possibility of hazardous reactions

(As tetraethylenepentamine)
Decomposes on burning. This produces toxic fumes including ammonia and nitrogen oxides. The substance is a strong base. It reacts violently with acid and is corrosive. Reacts with oxidants and chlorinated hydrocarbons. (ICSC 1718)

Conditions to avoid

Contact with incompatible materials.
Contact with fire source.

Incompatible materials
Acids, Oxidizing agents, Chlorinated hydrocarbons
Hazardous decomposition products
Carbon oxides, Nitrogen oxides, Ammonia

Section 11. Toxicological Information

Information on toxicological effects
Acute toxicity
Acute toxicity (Oral)
[Data for components of the product]
[NITE-CHRIP]
(Tetraethylenepentamine)
rat LD50: 2100 mg/kg (source: NITE)
(Triethylenetetramine)
rat LD50: 2500 mg/kg (source: NITE)
(Pentaethylenehexamine)
rat LD50: 1600 mg/kg (source: NITE)
Acute toxicity (Dermal)
[Product]
Category 3, Toxic in contact with skin
[Data for components of the product]
[NITE-CHRIP]
(Tetraethylenepentamine)
rabbit LD50: 660 mg/kg (source: NITE)
(Triethylenetetramine)
rabbit LD50: 550 mg/kg (source: NITE)
Irritant properties
Skin corrosion/irritation
[Product]
Category 1, Causes severe skin burns and eye damage
[Data for components of the product]
[NITE-CHRIP]
(Tetraethylenepentamine)
Category 1 (source: NITE)
(Triethylenetetramine)
Category 1 (source: NITE)
Serious eye damage/irritation
[Product]
Category 1, Causes serious eye damage
[Data for components of the product]
[NITE-CHRIP]
(Tetraethylenepentamine)
Category 1 (source: NITE)
(Triethylenetetramine)
Category 1 (source: NITE)
Sensitization
Skin sensitization
[Product]
Category 1, May cause an allergic skin reaction

[Data for components of the product]
[NITE-CHRIP]
(Tetraethylenepentamine)
Category 1 (source: NITE)
(Triethylenetetramine)
Category 1 (source: NITE)
Mutagenic effects data is not available.
Carcinogenic effects data is not available.
Reproductive toxicity data is not available.
Specific target organ toxicity (STOT)
STOT-single exposure
[Data for components of the product]
[NITE-CHRIP]
(Triethylenetetramine)
Category 3 (Respiratory tract irritation) (source: NITE)
STOT-repeated exposure
[Data for components of the product]
[NITE-CHRIP]
(Pentaethylenehexamine)
Category 2 (kidneys) (source: NITE)
Aspiration hazard data is not available.

Section 12. Ecological Information

Toxicity
Aquatic toxicity
[Product]
Category 1, Very toxic to aquatic life
Category 1, Very toxic to aquatic life with long lasting effects
[Data for components of the product]
Hazardous to the aquatic environment, short-term (acute)
[NITE-CHRIP]
(Tetraethylenepentamine)
Algae (Pseudokirchneriella subcapitata) 72-hour ErC50: 0.12 mg/L (source: NITE)
(Triethylenetetramine)
Algae (Raphidocelis subcapitata) 72-hour ErC50: 27 mg/L (source: NITE)
Fish (Oryzias latipes) 96-hour LC50: > 110 mg/L (source: NITE)
(Pentaethylenehexamine)
Algae (Pseudokirchneriella subcapitata) 72-hour ErC50: 0.42 mg/L (source: NITE)
Crustacea (Daphnia magna) 48-hour EC50: 8.0 mg/L (source: NITE)
Hazardous to the aquatic environment, long-term (chronic)
[NITE-CHRIP]
(Triethylenetetramine)
Algae (Raphidocelis subcapitata) 72-hour NOErC: 0.468 mg/L (source: NITE)
(Pentaethylenehexamine)
Algae (Pseudokirchneriella subcapitata) 72-hour NOEC: 0.072 mg/L (source: NITE)
Water solubility
(Tetraethylenepentamine)
miscible (source: ICSC, 2008)
(Triethylenetetramine)

not poorly water-soluble (4770000 mg/L) (source: NITE)

Persistence and degradability

[Data for components of the product]

(Tetraethylenepentamine)

Not rapidly degradable (Degradation rate: 0% (by BOD)) (OECD TG 301D, GLP) (source: NITE)

(Pentaethylenehexamine)

Not rapidly degradable (Degradation rate: 0% (by BOD)) (source: NITE)

Bioaccumulative potential

[Data for components of the product]

(Tetraethylenepentamine)

log Pow: −3.16 (calculated value) (source: ICSC, 2008)

(Triethylenetetramine)

log Kow: −2.65 (source: NITE)

Mobility in soil

Mobility in soil data is not available.

Other adverse effects

Ozone depleting chemical data is not available.

Section 13. Disposal considerations

Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging

Waste treatment methods

Avoid release to the environment.

Dispose of contents/container as industrial waste. Accordance with local/national regulation.

Section 14. Transport Information

UN Number or ID Number : 2320

UN Proper Shipping Name :

TETRAETHYLENEPENTAMINE

Class or division (Transport hazard class) : 8

Packing group : III

ERG GUIDE No.: 153

IMDG Code (International Maritime Dangerous Goods Regulations)

UN Number or ID Number : 2320

UN Proper Shipping Name :

TETRAETHYLENEPENTAMINE

Class or division (Transport hazard class) : 8

Packing group : III

IATA (Dangerous Goods Regulations)

UN Number or ID Number : 2320

UN Proper Shipping Name :

TETRAETHYLENEPENTAMINE

Class or division (Transport hazard class) : 8

Hazard labels : Corrosive

Packing group : III

Environmental hazards

Marine pollutants (yes/no) : yes

Section 15. Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture

U.S. Toxic Substances Control Act (TSCA) Inventory

Chemicals listed in TSCA Inventory

Triethylenetetramine; Tetraethylenepentamine; Pentaethylenehexamine

Other regulatory information

Ensure this material in compliance with federal requirements and ensure conformity to local regulations.

Section 16. Other information

References and sources for data

Globally Harmonized System of classification and labelling of chemicals, UN
Recommendations on the TRANSPORT OF DANGEROUS GOODS 22nd edit., 2021 UN
IMDG Code, 2022 Edition (Incorporating Amendment 41-22)
IATA Dangerous Goods Regulations (65th Edition) 2024
2020 EMERGENCY RESPONSE GUIDEBOOK (US DOT)
2024 TLVs and BEIs. (ACGIH)
JIS Z 7252 : 2019
JIS Z 7253 : 2019
2023 Recommendation on TLVs (JSOH)
Supplier's data/information

General Disclaimer

Please provide SDS to customers for selling or transferring.
All chemicals have unknown hazard. Handle the product with care.
This data sheet was created based on the information we currently have and may be revised according to new information. In addition, the precautions apply only to normal handling, and in the case of special handling, please make adequate countermeasure to maintain your safety.
The data given here is based on current knowledge and experience. The purpose of this Safety Data Sheet is to describe the products in terms of their safety requirements. The data does not signify any warranty with regard to the products' properties.
The GHS classification data given here is based on current Data published in Japan (National Institute of Technology and Evaluation (NITE) Chemical Risk Information Platform (NITE-CHRIP), up to FY2023).