SAFETY DATA SHEET (SDS)
BENZENE

1. Identification

SDS Record Number	:	PCS 95004	
Date of SDS	:	01 November 2024	
Identity of the substance	:	Benzene	
Product Description	:	Aromatic hydrocarbon	
Other names/synonyms	:	Benzol, Phenyl hydride, Benzene and mixtures having 10% benzene or more (IBC code)	
Name of the supplier	:	PCS Pte. Ltd.	
Recommended uses	:	Chemical feedstock	
Contact detail of the supplier	:	100 Ayer Merbau Road, Singapore 628277	
	:	+65 68672102	
24-Hour Emergency contact	:	Asia Pacific	+65 3158 1074 (Singapore)
		China	400 120 6011
		Europe, Israel & Americas	+44 (0) 1235 239 670 (UK)
		Middle East & Africa	+44 (0) 1235 239 671 (UK)

2. Hazards Identification

GHS Classification

Hazard Class	Hazard Category
• Flammable Liquid	2
• Acute Toxicity (Inhalation: Vapours)	4
• Skin Corrosion/Irritation	2
• Serious Eye Damage/ Irritation	2
• Germ Cell Mutagenicity	1B
• Carcinogenicity	1A
• Reproductive Toxicity	2
• STOT (Single exposure)	1 (Cardiovascular system, central nervous system) 3 (Narcotic effects, respiratory tract irritation)
• STOT (Repeated exposure)	1 (Central nervous system, hematopoietic organs, immune system)
• Aspiration Hazard	1
• Chronic Hazards to Aquatic Environment	2

Pictograms

Signal Word: Danger

Hazard Statements

- Highly flammable liquid and vapour
- Harmful if inhaled
- Causes skin irritation
- Causes serious eye irritation
- May cause genetic defects
- May cause cancer

- Suspected of damaging fertility or the unborn child
- Causes damage to organs
- May cause drowsiness or dizziness
- May cause respiratory irritation
- Causes damage to central nervous system, hematopoietic system, immune system through prolonged or repeated exposure
- May be fatal if swallowed and enters airways
- Toxic to aquatic life with long lasting effects

Precautionary Statements

Prevention

- Keep container tightly closed
- Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- Ground/bond container and receiving equipment
- Use explosion-proof electrical/ventilating/lighting equipment
- Use only non-sparking tools
- Take action to prevent static discharge
- Wear protective gloves/protective clothing/eye protection/face protection
- Wash thoroughly after handling
- Do not eat, drink or smoke when using this product
- Obtain special instructions before use
- Do not handle until all safety precautions have been read and understood
- Do not breathe dust/fume/gas/mist/vapours/spray
- Use only outdoors or in well-ventilated area
- Avoid release to the environment

Response

- IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
- In case of fire: Use appropriate media for extinction
- IF ON SKIN: Wash with plenty of soap and water
- If skin irritation occurs: Get medical advice/attention
- Take off contaminated clothing and wash before re-use
- 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: Immediately call a POISON CENTER/doctor/physician
- Do NOT induce vomiting
- IF exposed or concerned: Get medical attention/advice. Call a POISON CENTER/ doctor/ physician
- Get medical advice/attention if you feel unwell
- IF INHALED: Remove victim to fresh air and keep comfortable for breathing
- Call a POISON CENTER/doctor/physician if you feel unwell
- Collect spillage

Storage

- Store in a well-ventilated place. Keep cool.
- Store locked up
- Store container in a well-ventilated place. Keep container tightly closed.

Disposal

- Dispose of the contents/container in accordance to the local mandatory rules and regulations

3. Composition/Information on Ingredients

Chemical identification : Benzene
Common name(s) / synonym(s) : Benzene, Bicarburet of hydrogen, carbon oil, coal naphtha, cyclohexatriene, mineral naphtha, phenyl hydride, pyrobenzol
CAS number / EC number : 71-43-2 / 200-753-7

Chemical Identification	CAS Number	Concentration
Benzene	71-43-2	≤ 100 wt%

4. First-Aid Measures

Eye Contact:
Irrigate immediately. If this chemical contacts the eyes, immediately wash (irrigate) the eyes with large amounts of water, occasionally lifting the lower and upper lids. Get medical attention immediately.

Skin Contact:
Soap wash immediately. If this chemical contacts the skin, immediately wash the contaminated skin with soap and water. If this chemical penetrates the clothing, immediately remove the clothing, wash the skin with soap and water, and get medical attention promptly.

Ingestion:
Medical attention immediately. If this chemical has been swallowed, get medical attention immediately. **Do not** induce vomiting. Keep at rest.

Inhalation:
Respiratory support. If a person breathes large amounts of this chemical, move the exposed person to fresh air at once. If breathing has stopped, perform artificial resuscitation. Keep the affected person warm and at rest. Get medical attention as soon as possible.

5. Fire-Fighting Measures

Recommended Fire Extinguishing Agents:
- Water spray, foam or dry chemical based on situation.

Small Fires
- Dry chemical, carbon dioxide, water spray or regular foam.

Large Fires
- Water spray, fog or regular foam.
- Do not aim straight or solid streams directly.
- Move containers from fire area if you can do it without risk.

Fire Involving Tanks or Car/Trailer Loads
- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- **Always** stay away from tanks engulfed in fire.
- For massive fire, use unmanned master stream devices or monitor nozzles; if impossible, withdraw from area and let fire burn.

Special Fire Fighting Procedures:
- Use water spray to cool fire exposed surfaces and to protect personnel.
- Shut off fuel to fire if possible to do so without hazard.
- If a leak or spill has not ignited use water spray to disperse the vapours.
- Either allow fire to burn out under controlled conditions or extinguish with foam or dry chemical.
- Try to cover liquid spills with foam.

Caution: All these products have a very low flash point: Use of water spray when fighting fire may be inefficient.

Special Protective Equipment and Precautions for Fire Fighters:
- A self-contained breathing apparatus (SCBA) is recommended for indoor fires and any significant outdoor fires.
- For small outdoor fires, which may easily be extinguished with a portable fire extinguisher, use of an SCBA is optional.

Specific Hazards Arising from the Chemical:
- This is a flammable liquid and may release vapours that form flammable mixtures at or above the flash point.
- Vapours are heavier than air and may travel to a source of ignition and flash back.

Hazardous Combustion Products:
- Combustion may produce carbon dioxide, toxic carbon monoxide.
- Unidentified organic compounds may be formed during combustion.

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6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures:
- **Call Emergency Response** Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number.
- As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions.
- Keep unauthorised personnel away.
- Stay upwind.
- Keep out of low areas.
- Ventilate closed spaces before entering.
- Remove all ignition sources.
- Dike far ahead of liquid spill for later disposal.
- Water spray may reduce vapour; but may not prevent ignition in closed spaces.
- Warn occupants and shipping in downwind areas of fire and explosion hazard and request all to stay clear.

Environmental Precautions:
- Product has limited solubility in water and will float on the surface.

Methods and Materials for Containment and Cleaning Up:
- Collect leaking and spilled liquid in sealable containers as far as possible.
- Prevent additional discharge of material, if possible to do so without hazard.
- Absorb remaining liquid in sand or inert absorbent and remove to safe place.
- Recover by pumping (use an explosion proof motor or hand pump), or by using a suitable absorbent.
- Do not use combustible materials such as sawdust.
- **Do not** wash away into sewer. Do NOT let this chemical enter the environment.
- Notify the appropriate authorities immediately.
- Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations.

- Personal protection: Wear complete protective clothing including self-contained breathing apparatus.

Evacuation:

Large Spill
- Consider initial downwind evacuation for at least 300 meters (1000 feet).

Fire
- If tank, rail tank car or highway tank is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

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7. Handling And Storage

Precautions for Safe Handling:
- Keep container closed. Use with adequate ventilation. Handle and open containers with care.
- **Do not** handle or store near an open flame, heat, or other sources of ignition.
- Protect material from direct sunlight.
- Material will accumulate static charges, which may cause an electrical spark (ignition source). Use proper grounding procedures.
- **Do not** pressurize, cut, heat, or weld containers. Empty product containers may contain product residue.
- **Do not** reuse empty containers without commercial cleaning or reconditioning.
- Wash thoroughly after handling. Remove contaminated clothing and wash before reuse.
- Avoid contact with eyes, skin, and clothing.

Storage:
- Store in a cool, well-ventilated place away from incompatible materials.
- Keep away from sources of ignition. Store in a tightly closed container. Keep from contact with oxidising materials.

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8. Exposure Controls/Personal Protection

Control Parameters/ Exposure Limits
Benzene (CAS: 71-43-2)
Permissible Exposure Level (Long Term) in Singapore: 1ppm (3.18mg/m^3)
TLV: 0.5 ppm as TWA; 2.5 ppm as STEL [C]; A1 (confirmed human carcinogen); (ACGIH).
PEL: 10 ppm as TWA (OSHA Z-2)

Appropriate Engineering Controls: The use of local exhaust ventilation is recommended to control emissions near the source. Laboratory samples should be handled in a fume hood. Provide mechanical ventilation of confined spaces. Use explosion-proof ventilation equipment.

Personal Protective Equipment (PPE)
- The selection of personal protective equipment varies depending upon conditions of use. Where prolonged and/or repeated skin and eye contact is likely to occur, wear chemical resistant gloves, rubber boots a chemical jacket, and a face shield. Where skin and eye contact is unlikely, but may occur as a result of short and/or periodic exposures, wear long sleeves, chemical resistant gloves, and a face shield.
- **Skin:** Prevent skin contact. Wear appropriate personal protective clothing to prevent skin contact.
- **Eyes:** Prevent eye contact. Wear appropriate eye protection to prevent eye contact.
- **Wash skin:** When contaminated the worker should immediately wash the skin when it becomes contaminated.
- **Remove:** When wet (flammable). Work clothing that becomes wet should be immediately removed due to its flammability hazard (i.e., for liquids with a flash point <100°F).

- **Change:** No recommendation. No recommendation is made specifying the need for the worker to change clothing after the work shift.
- **Provide Eyewash:** Quick drench Facilities for quickly drenching the body should be provided within the immediate work area for emergency use where there is a possibility of exposure. [Note: It is intended that these facilities provide a sufficient quantity or flow of water to quickly remove the substance from any body areas likely to be exposed. The actual determination of what constitutes an adequate quick drench facility depends on the specific circumstances. In certain instances, a deluge shower should be readily available, whereas in others, the availability of water from a sink or hose could be considered adequate.]

Respirator Recommendations (NIOSH)

Airborne Concentration or Condition of Use	Required Respirator
< or = 10 ppm (parts per million)	Half-mask air-purifying respirator with organic vapour cartridge.
< or = 50 ppm	**(1)** Full-face piece respirator with organic vapour cartridges; or **(2)** Full-face piece gas mask with chin-style canisters*****.
< or = 100 ppm	Full-face piece powered air-purifying respirator with organic vapour canister*****.
< or = 1,000 ppm	Supplied-air respirator with full facepiece in positive-pressure mode.
> 1,000 ppm or unknown concentration	**(1)** Self-contained breathing apparatus with full facepiece in positive-pressure mode; or **(2)** Full-face piece positive-pressure supplied-air respirator with auxiliary self-contained air supply.
Escape	**(1)** Any organic vapour gas mask; or **(2)** Any self-contained breathing apparatus with full facepiece.
Firefighting	Full-face piece self-contained breathing apparatus in positive-pressure mode.

***** Canisters must have a minimum service life of four (4) hours when tested at 150 ppm benzene, at a flow rate of 64 litres per minute (LPM), 25°C, and 85% relative humidity for non-powered air-purifying respirators. The flow rate shall be 115 LPM and 170 LPM, respectively, for tight-fitting and loose-fitting powered air-purifying respirators.

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9. Physical And Chemical Properties

Property	Value, Description
Appearance (physical state, colour etc.)	Liquid, Clear colourless liquid
Odour	Aromatic odour
Odour threshold	Not available
pH	Not applicable
Melting point/freezing point	6°C
Initial boiling point and boiling range	80°C
Flash point	-11°C ASTM D56
Evaporation rate	5.1 (diethyl ether = 1)
Flammability	Highly flammable liquid
Upper/lower flammability or explosive limits	Lower: 1.2% (V); Upper: 8% (V)
Vapour pressure	10 kPa at 20°C
Relative vapour density	2.7 at 15°C (Air = 1)
Density and/or Relative density	Relative density: 0.88 (Water = 1)

Property	Value, Description
Solubility	0.18g/100ml at 25°C (Water)
Partition coefficient: n-octanol/water (log value)	2.13
Auto-ignition temperature	498°C
Decomposition temperature	Not available
Kinematic Viscosity	0.65 mm^2/s at 20°C
Particle characteristics	Not applicable

10. Stability And Reactivity

Reactivity/Chemical Stability: This product is stable under normal temperatures and pressures.

Possibility of Hazardous Reactions: Hazardous polymerisation will not occur.

Conditions to Avoid: Keep away from ignition sources (e.g. heat, sparks, and open flames).

Incompatible Materials: Strong oxidising agents, fluorine, chlorine, concentrated mineral acids, halogens, molten sulphur, pure oxygen.

Hazardous Decomposition Products: carbon monoxide, carbon dioxide

11. Toxicological Information

Potential Health Effects:

Primary Route of Exposure:
Eye : ✓
Skin : ✓
Inhalation : ✓
Ingestion : ✓

LC50 (rat): 13,700 ppm (4 hour exposure) (26); 9,980 ppm (7 hour exposure); (13,200 ppm - equivalent 4 hour exposure) (18)
LD50 (oral, rat): 930 mg/kg (19); 5,600 mg/kg (2); 11.4 ml/kg (10,032 mg/kg) (21)
LD50 (oral, mouse): 4,700 mg/kg (11; unconfirmed)
LD50 (skin, rabbit and guinea pig): Greater than 9,400 mg/kg (20).

Eye Irritation (rabbit):
Application of 2 drops produced moderate irritation with very slight, temporary injury to the cornea. (2) Application of 0.1 ml (88 mg) in a Standard Draize test produced moderate eye irritation. (21).

Skin Irritation (rabbit):
In a Standard Draize test, slight to moderate irritation and moderate tissue death (necrosis) was produced. (2) In an Open Draize test, 0.01 ml (8.8 mg) produced mild skin irritation. (21).

Skin Sensitization (guinea pig):
One report of skin sensitization cannot be confirmed. (4).

Effects of Short-Term (Acute) Exposure:
The immediately noticeable effect is depression of the central nervous system (CNS) with drowsiness, incoordination and unconsciousness, eventually leading to death. (1) On autopsy, slight liver, and sometimes kidney, changes were noted. (2) In many studies, short-term exposure to very low levels by inhalation or ingestion has caused very harmful changes to the blood and immune systems. All major types of blood cells, including red blood cells, platelets and white blood cells are susceptible. Two common effects are a decreased number of lymphocytes (cells which produce antibodies)

(lymphocytopenia) and a reduced number of red blood cells (anaemia). Mice exposed continuously by inhalation to 21 ppm for 4 to 10 days showed significant changes in all blood parameters tested. Concentrations as low as 10 ppm have caused immunological changes in rats. Some effects may be reversible once exposure stops. (1, 13)

A few studies have been reported regarding potential behavioural effects of benzene. Increased behavioural activity (sleeping, grooming, locomotion and fighting) was observed in mice following exposure to 300 or 900 PPM for 5 days. (1) The significance of these changes is not known.

Effects of Long-Term (Chronic) Exposure:

Effects on the Blood and Blood-Forming Organs:
Extensive studies have conclusively proven that oral and inhalation exposure to benzene causes severe effects on the blood system, including damaging the bone marrow where new blood cells are formed. Most studies report a decrease in haemoglobin, haematocrit, red and white blood cells, platelets and/or changes in the cells. Effects of varying severity have been demonstrated with both intermittent and continuous exposures to concentrations as low as 10 ppm for 24 weeks. (1, 3)

Effects on the Immune System:
Studies have also conclusively shown that benzene causes harmful changes to the immune system, which protects the body from disease. Benzene has decreased the number of mature B- and T-lymphocytes (white blood cells which produce disease-fighting antibodies). Exposure of mice to 300 ppm for 6 to 23 weeks resulted in a decrease in the number of mature B- and T-lymphocytes. Rats and mice exposed orally to 25 to 200 mg/kg/day for 2 years had significantly reduced white blood cells and lymphocytes. (1)

Carcinogenicity:
The International Agency for Research on Cancer (IARC) has concluded that there is sufficient evidence for the carcinogenicity of benzene in animals. Benzene is known to be carcinogenic in humans. (12) Inhalation and ingestion studies with rats and mice have shown cancer of the lymph system (lymphoma), the blood (leukaemia), and the bone marrow (myeloma), as well as tumours of the liver, zymbal gland, mammary gland, lungs, thymus, nasal and oral cavities. Inhalation exposures were in the range of 100 to 1,200 ppm while ingestion exposures were 25 to 500 mg/kg, usually for the lifetime of the animal. (1, 12, 13)

Teratogenicity/Embryotoxicity:
Many studies have been conducted on rats, mice and rabbits, primarily with inhalation exposures and with concentrations ranging up to 2,200 ppm. Results show that benzene is not teratogenic or embryotoxic even at levels that caused maternal toxicity. Foetal toxicity (reduced birth weight and/or minor skeletal variations) was observed at exposures above 50 ppm. In these studies, mild maternal toxicity was also seen (reduced weight gain). (1, 3, 22, 23)

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Reproductive Toxicity:
Benzene does not appear to cause reproductive toxicity. Effects on reproductive organs (testes and ovaries) have been shown at doses, which caused other significant signs of toxicity in the animals. (2.24)
Female rats were exposed to up to 300 ppm, 6 hours per day, from 10 weeks pre-mating through nursing of the offspring with no effect on female reproductive performance. (5) In another study, where female rats were exposed continuously to 210 ppm 10 to 15 days before and 3 weeks after mating, there were no litters. There are no further details available for interpretation of this study. (1)

Mutagenicity:
Benzene has been extensively examined in mutagenicity studies with rats and mice with positive results in virtually all tests reported. Analyses of bone marrow and lymphocytes of animals exposed to concentrations as low as 1 ppm have found increases in chromosomal aberrations, sister chromatic exchanges and micronuclei. Other studies have shown changes in DNA in certain cell types. (1) Recent studies have focused on mutagenesis with low-level short-term exposures. Prolonged exposure of mice to levels at or below 1 ppm (40, 100 and 1000 ppb for 22 hours per day for 6 weeks) produced an increase in mutations in lymphocytes at the two lower exposure levels. (6, 7)

Inhalation:
Vapour concentrations above recommended exposure levels are irritating to the eyes and the respiratory tract, may cause headaches and dizziness, are anaesthetic and may have other central nervous system effects. This product contains benzene. High concentrations may lead to central nervous system effects (drowsiness, dizziness, nausea, headaches, convulsions, paralysis and loss of consciousness). Death due to breathing failure may occur almost immediately or may be delayed several hours to several days if the exposure is extremely high. May cause blood or blood producing system disorder and/or damage.

Eye Contact:
Irritating, but will not injure eye tissue.

Skin Contact:
Brief contact with the liquid will not result in significant irritation unless evaporation is prevented. Frequent or prolonged contact may irritate the skin and cause a skin rash (dermatitis). Evidence does not clearly indicate whether benzene can be easily absorbed through the skin; however, damaged skin may allow the absorption of benzene. Exposure under these circumstances could add to the toxic effects caused by breathing benzene vapours.

Ingestion:
Small amounts of this liquid drawn into the lungs from swallowing or vomiting may cause severe health effects (e.g. bronchopneumonia or pulmonary oedema).

Chronic:
Human health studies (epidemiological) indicate that prolonged and/or repeated overexposures of benzene may cause damage to the blood producing system (particularly the bone marrow) and serious blood disorders including leukaemia. Animal tests indicate that benzene does not cause malformations but may be toxic to the embryo/foetus. The relationship of the results to humans has not been established.

The International Agency for Research on Cancer (IARC) has evaluated benzene and found it to be a human carcinogen.

The National Toxicology Program (NTP) has evaluated benzene and found it to be a human carcinogen.

Other human data:
- It has been stated that 3,000 ppm is endurable for 0.5 to 1 hour [Flurry 1928].
- It has also been stated that exposure at 19,000 to 20,000 ppm for 5 to 10 minutes is fatal;
- Exposure at 7,500 ppm for 30 minutes is dangerous;
- Exposure at 1,500 ppm for 60 minutes induces serious symptoms;
- Exposure at 500 ppm for 60 minutes leads to symptoms of illness;
- Exposure at 50 to 150 ppm for 5 hours produces headache, lassitude, and weakness; and
- Exposure at 25 ppm for 8 hours has no effect [Gerarde 1960].

Revised IDLH: 500 ppm
Basis for revised IDLH: The revised IDLH for benzene is 500 ppm based on acute inhalation toxicity data in humans [Gerarde 1960]. [Note: NIOSH recommends as part of its carcinogen policy that the "most protective" respirators be worn for benzene at concentrations above 0.1 ppm. OSHA currently requires in 29 CFR 1919.1028 that workers be provided with and required to wear and use the "most protective" respirators in concentrations exceeding 1,000 ppm (i.e., 1,000 x the PEL).]

12. Ecological Information

Acute Toxicity:

Fish	**: Toxic**: 1 < LC/EC/IC50 <= 10 mg/l
Aquatic Invertebrates	**: Toxic**: 1 < LC/EC/IC50 <= 10 mg/l
Algae	**:** Harmful: 10 < LC/EC/IC50 <= 100 mg/l
Microorganisms	**:** Harmful: 10 < LC/EC/IC50 <= 100 mg/l
Mobility	**:** Floats on water.
Persistence and Degradability	**:** Readily biodegradable.
Potential to Bioaccumulate	**:** Does not bioaccumulate significantly.
Other Adverse Effects	**:** In view of the high rate of loss from solution, the product is unlikely to pose a significant hazard to aquatic life.

13. Disposal Considerations

Waste Disposal Methods
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 classification and disposal methods in compliance with applicable regulations.

Disposal should be in accordance with applicable regional, national, and local laws and regulations.

14. Transport Information

Land (ADR)
UN Number: 1114
UN proper shipping name: BENZENE
Class: 3
Classification Code: F1
Packing Group: II
Labels: 3
Hazard Identification Number: 33

Air (IATA)
UN Number: 1114
UN proper shipping name: BENZENE
Class: 3
Packing Group: II
Labels: 3

Sea (IMDG)
UN Number: 1114
UN proper shipping name: BENZENE
Class: 3
Packing Group: II
Labels: 3
Marine pollutant: No

Transport in Bulk (Annex II of MARPOL 73/78 and the IBC code)
Pollution Category: Y
Ship Type: 3
Product Name: Benzene and mixtures having 10% benzene or more

15. Regulatory Information

Workplace Safety and Health Act & Workplace Safety and Health (General Provisions) Regulations:
This product is subject to the SDS, labelling and PEL and other requirements in the Act/Regulations.

Fire Safety Act and Fire Safety (Petroleum and Flammable Materials) Regulations:
This product is subject to the requirements of this Regulations.

Maritime and Port Authority of Singapore (Dangerous Goods, Petroleum and Explosives) Regulations:
This product is subject to the requirements of this Regulations.

Chemical Inventory Status:

Australia, AIIC:	Yes
China, IECSC:	Yes
Japan, ENCS:	Yes
USA, TSCA:	Yes

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16. Other Information

Prepared By: Material Safety Committee
SDS Prepared on: 1/10/2010
Reviewed 1 on 1/10/2013
Revised 2 on 11/2/2015
Revised 3 on 05/11/2019
Revised 4 on 01/11/2024

Revision (2) Notes	
1	Sect. 14: Added information for Transport in Bulk according to MARPOL 73/78 Annex II
Revision (3) Notes	
1	Sect. 2: Updated to include chronic toxicity to aquatic environment.
2	Sect. 8: Added/updated Control Parameters and Exposure Limits for relevant components in the mixture
3	Sect. 14: Added relevant transport information
4	Sect. 15: Included applicable national regulations (Singapore)
Revision (4) Notes	
1	Revised according to SS 586-3:2022
2	Sect. 2: Change Acute Toxicity from Oral to Inhalation
3	Sect. 2: Updated classification for Germ Cell Mutagenicity
4	Sect. 2: Replaced respiratory organs with CS and CNS for STOT (Single Exposure) Cat 1, added RTI for STOT (Single Exposure) Cat 3
5	Sect. 2: Added immune system for STOT (Repeated Exposure) Cat 1
6	Sect. 2: Inserted pictogram corresponding to Chronic Hazards to Aquatic Environment
7	Sect. 3: Rearranged chemical accordingly to descending order of concentrations
8	Sect. 9: Updated Physical and Chemical Properties
9	Sect. 12: Updated Acute Toxicity for Aquatic Invertebrates
10	Sect. 14: Updated relevant transport information
11	Sect. 15: Included Chemical Inventory Status for Australia, China Japan, USA

CAUTION: The information given above ("**the Information**") relates only to the substance or mixture listed herein. The Information may not be valid when used in combination with any other substance or mixture or in any process. If the substance or mixture is to be used for a purpose other than that stated herein or under conditions other than specified herein, the Information cannot be relied upon as being complete or accurate, and the user is advised to consult the supplier before using the substance or mixture for such other purpose or under such other conditions. The Information is given based on information available at the indicated date of preparation and no representation or warranty is given that it will be correct as of any time after the indicated date of preparation.