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

1) Product identifier: BAB
2) Relevant identified uses of the substance or mixture and uses advised against:
Intermediate, viscosity adjusters, laboratory materials
3) Manufacture/Supplier/Distributor information:
○ Manufacture information:
Company name: ISU CHEMICAL CO., LTD
Address: 108-224, Sapyeongro, Nam-gu, Ulsan, Korea
Emergency telephone number: Tel. +82 52 231 5587 Fax. +82 52 231 5699

2. HAZARD IDENTIFICATION

1) Hazard classification: Aspiration hazard Cat.1
Skin corrosion / irritation Cat.2
Serious eye damage or eye irritants Cat.2B
2) Allocation label elements including precautionary statements
○ Hazard pictograms

○ Signal word
- Danger
○ Hazard statements
- H304: May be fatal if swallowed and enters airways
- H315: Causes skin irritation
- H320: Causes eye irritation

○ Precautionary statements
- Prevention:
· P264: Wash thoroughly after handling.
· P280: Wear protective gloves / protective clothing / eye protection / face protection.
- Response
· P301+P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
· P302+P352: IF ON SKIN: Wash with plenty of 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.
· P321: Give first aid.
· P331: Do NOT induce vomiting.
· P332+P313: If skin irritation occurs: Get medical advice / attention.
· P337+P313 : If eye irritation persists get medical advice/attention.
· P362+P364: Take off contaminated clothing and wash before reuse.

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- Storage

· P405: Store locked up.

- Disposal

· P501: Dispose of contents container according to applicable regulations.

3) Other hazards: No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	Common name	CAS No.	Concentration(wt%)
Tetrapropylenebenzene	Naphtha (petroleum), light alkylate	25265-78-5	100

4. FIRST AID MEASURES

1) Following eye contact:
- Call 911 or emergency medical service.
- In case of contact with substance, immediately flush eyes with running water for at least 20 minutes.

2) Following skin contact:
- If skin irritation occurs: Get medical advice / attention.
- Take off contaminated clothing.
- For hot material, soak or rinse the affected area with plenty of cold water to dissipate heat.
- Call 911 or emergency medical service.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin with running water for at least 20 minutes.
- For minor skin contact, avoid spreading material on unaffected skin.

3) Following inhalation:
- Do NOT induce vomiting.
- Move victim to fresh air.
- If not breathing, give artificial respiration.
- If breathing is difficult, give oxygen
- Keep victim warm and quiet.

4) Following ingestion:
- IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
- Do NOT induce vomiting.

5) Advice to physician:
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

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5. FIRE FIGHTING MEASURES

1) Suitable (and unsuitable) extinguishing media:
   - Use alcohol foam, carbon dioxide, or water spray when fighting fires involving this material.
   - Use dry sand or earth to smother fire.
2) Special hazards arising from the substance or mixture:
   - Decomposes on high temperature and can form toxic gas.
   - Containers may explode when heated.
   - Some may burn but none ignite readily.
   - Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.
3) Special protective equipment for firefighters:
   - Rescuers must use appropriate protective equipment.
   - Evacuate area and fight fire from a safe distance.
   - Substance may be transported in a molten form.
   - Please note that some may be transported at high temperatures.
   - Dike fire-control water for later disposal; do not scatter the material.
   - Move containers from fire area if you can do it without risk.
   - Fire involving Tanks: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
   - Fire involving Tanks: Cool containers with flooding quantities of water until well after fire is out.
   - Fire involving Tanks: Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
   - Fire involving Tanks: ALWAYS stay away from tanks engulfed in fire.
   - Fire involving Tanks: For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

6. ACCIDENTAL RELEASE MEASURES

1) Health considerations and protective equipment:
   - Clean up spills immediately, observing precautions in Protective Equipment section.
   - Remove all ignition source
   - Stop leak if you can do it without risk.
   - Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
   - Cover with plastic sheet to prevent spreading.
   - Prevent dust formation.
   - Please note that materials and conditions to be avoided.

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2) Environmental precautions:
- Prevent the inflow to the canal, drain, basement, and closed-door.
- Do not discharge into the environment

3) For cleaning up:
- Absorb spill with inert material (e.g., dry sand or earth), then place in a chemical waste container.
- Absorb the liquid and scrub the area with detergent and water.
- In case of large spill, make ditch far from liquid spill.
- Keep spills in clean dry container with clean shovel, close loosely and remove container from spill area.
- In case of powder leakage, cover with plastic sheet to prevent diffusion and Keep dry.
- In case of small spill, absorb into sand, non-combustible material and place into container.

7. HANDLING AND STORAGE

1) Precautions for safe handling:
- Wash thoroughly after handling.
- Do not handle until all safety precautions have been read and understood.
- Follow all MSDS/label precautions even after container is emptied because they may retain product residues.
- Avoid prolonged or prolonged skin contact.
- Use care in handling/storage.
- Loosen closure cautiously before opening.
- Avoid breathing vapors from heated material.
- Do not enter storage area unless adequately ventilated.
- Please note that materials and conditions to be avoided.
- Refer to engineering management and personal protective equipment.
- Be careful of high temperatures.

2) Conditions for safe storage (including any incompatibilities):
- Empty drums should be completely drained, properly bunged, and promptly returned to the drum reconditioners or properly placed.
- Store locked up.

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8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

1) Chemical exposure limits, Biological exposure standard:

Components	Occupational exposure limits (Domestic)	ACGIH	Biological limit values
Tetrapropylenebenzene	No data available	No data available	No data available

2) Appropriate engineering controls:
- If user operations generate dust, fume, or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.
- Equipment for storing or using this material should be provided with a cleansing device and a safety shower.

3) Personal protection equipment

○ Respiratory protection:
- Wear respiratory protective equipment certified by the Occupational Safety and Health Agency according to the physical and chemical properties of the gas / liquid exposed [For gas / liquid substances the following respiratory protection is recommended Gas masks (for organic compounds (if acid gases are acid gases)) or sequestered Gas masks (for organic compounds (for acid gases, for acid gases)) or direct type front face type Gas masks (for organic compounds (for acid gases, acid gases)) or other masks(For organic compounds (for acid gases, for acid gases)) or electric gas masks
- In case of lack of oxygen (<19.5%), wear breathing mask or self-contained breathing

○ Eye protection:
- Wear safety goggles or breathable goggles to protect eyes from vaporous organic substances that cause eye irritation or other health hazards.
- Install emergency washing facilities (shower type) and washing facilities in a location easily accessible to workers.

○ Hand protection:
- Wear appropriate protective gloves by considering physical and chemical properties of chemicals.

○ Body protection:
- Wear appropriate protective clothing by considering physical and chemical properties of chemicals.

9. PHYSICAL AND CHEMICAL PROPERTIES

1) Appearance(Physical state, color, etc): Colorless liquid
2) Odor: Faint odor

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3) Odor threshold: No data available
4) pH: No data available
5) Melting point/freezing point: -67℃
6) Initial boiling point and boiling range: 261-307℃
7) Flash point: 120-124℃
8) Evaporation rate: No data available
9) Flammability(solid, gas): Not applicable
10) Upper/lower flammability or explosive limits: No data available
11) Vapour pressure: 49000 mmHg at 25℃
12) Solubility(ies): 41 μg/L at 27℃
13) Vapour density: No data available
14) Relative density: 0.869 - 0.870 @ 15/4℃
15) n-octanol/water partition coefficient: 5.72~5.75 at 25℃
16) Auto ignition temperature: 395 ℃
17) Decomposition temperature: No data available
18) Viscosity: : 5.76~5.82 cSt at 40℃
19) Molecular weight(mass): 245.1

10. STABILITY AND REACTIVITY

1) Stability and hazardous reactivity:
   - Containers may explode when heated.
   - Some may burn but none ignite readily.
   - Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.
   - May cause irritating, corrosive or toxic gas in fire
2) Conditions to avoid:
   - Ignition source(heat, spark, flame)
3) Incompatible materials:
   - Combustibles, reducing material
4) Hazardous decomposition products:
   - Pyrolysis or combustion may produce irritating and very toxic gases during burning
   - Corrosive/toxic fume
   - Irritating, corrosive and/or toxic gases

11. TOXICOLOGICAL INFORMATION

1) Exposure route information
   - Absorbs body by inhalation

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- Absorbs body by inhalation and extinguisher
- Absorbs body through inhalation of aerosol through skin and digestive system
- Possible to absorb the body by inhalation of steam
- Absorbs the body by inhalation, skin and extinguisher

2) Health hazard information

○ Acute toxicity:
- Oral: LD50 > 17,000 mg/kg (Rat, Sprague-Dawley)
- Dermal: LD50 > 10,200 mg/kg (Rabbit, New Zealand)
- Inhalation(Gas): Not applicable
- Inhalation(Vapor): No data available
- Inhalation(mist): LC50> 71 mg/L (Rat, Holtzman)

○ Skin corrosion/Irritation: moderate irritation(Rabbit, 3.8/8.0)

○ Serious eye damage/irritation: Mild irritability(Rabbit, 20.8/110)

○ Respiratory sensitization: No data available

○ Skin sensitization: Not sensitising (Guinea pig, OECD TG 406))

○ Carcinogenicity: Not observed (Mouse, 80 weeks, Dodecylbenzene)

○ Germ cell mutagenicity:
- In vivo : Negative (Chromosomal abnormality using mammalian bone marrow cells, Rat/Sprague-Dawley)
- In vitro - Negative (Return mutation, S. typhimurium TA98, 100, 1535, 1537, metabolic activity system with or without), Negative (regardless of chromosomal abnormality, CHO cell, or metabolic activity system using mammalian culture cells)

○ Reproductive toxicity:
- Rat, 2nd generation reproductive toxicity test results showed no reproductive / developmental toxicity due to exposure

○ Specific target organ toxicity (single exposure): No data available

○ Specific target organ toxicity (repeated exposure):
- Under the experimental conditions of the study, based on the microscopic findings observed at the low-dose considered as nonadverse. Treatment-related macroscopic changes were noted in the liver at 800 mg/kg/day and forestomach at all doses in both sexes. (Rat, OECD TG 407, GLP)

○ Aspiration hazard:
- As a kinematic viscosity of 5 ~ 6 mm^2 / s at 40 ℃, it may be aspiration hazard (GLP)

12. ECOLOGICAL INFORMATION

1) Aquatic toxicity:

-Fish: No toxicity observed due to exposure to the limit of acceptance(Fatead minnow, 96h)

-Crustaceans: No toxicity observed due to exposure to the limit of acceptance(Daphnia magna, 48h)

-Algae: No toxicity observed due to exposure to the limit of acceptance(Selenastrum capricomutum, 96h)

2) Persistence and degradation: log Kow= 5.72~5.75
3) Bioaccumulative potential: BCF= 35
4) Mobility in soil: Koc= 75858 (Calculated, OECD TG 121, GLP)
5) Other adverse effects: No data available

13. DISPOSAL CONSIDERATIONS

1) Disposal methods:
- Please incinerate.
- Incinerate residues after treatment by evaporation and concentration.
- After refining by separation, distillation, extraction and filtration, incinerate the residue.
- Residues generated after treatment by reaction of neutralization, oxidation, reduction, polymerization, condensation should be incinerated or reprocessed by flocculation, sedimentation, filtration and dehydration.

2) Precautions (including disposal of contaminated container of package):
- Dispose of contents container (according to the description in the related regulation).

14. TRANSPORT INFORMATION

1) UN No.: No information on classification of hazardous materials transportation
2) Proper shipping name: Not applicable
3) Class or division: Not applicable
4) Packing group: Not applicable
5) Marine pollutant: Not applicable
6) Special safety response for transportation or transportation measure: Not applicable

15. REGULATORY INFORMATION

1) Occupational Safety and Health Act in Korea: Not applicable
2) Chemicals Control Act in Korea: Not applicable
3) Safety Control of Dangerous Substances Act in Korea: Class 4 Third Petroleum liquids 2000ℓ
4) Wastes Control Act in Korea: Designated waste
5) Other regulations in KOREA and Abroad regulations:
- Other regulation (Domestic):
  - Persistent Organic Pollutants (POPs) Control Act: Not applicable
- National regulations:
  - U.S.A. management information(OSHA regulation): Not applicable
  - U.S.A. management information(CERCLA regulation): Not applicable

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- U.S.A. management information(EPCRA 302 regulation): Not applicable
- U.S.A. management information(EPCRA 304 regulation): Not applicable
- U.S.A. management information(EPCRA 313 regulation): Not applicable

- U.S.A. management information(Rotterdam Convention on Substances): Not applicable
- U.S.A. management information(Stockholm Convention on Substances): Not applicable
- U.S.A. management information(Mont- real Protocol on Substances): Not applicable
- EU Classification (Classification): Not applicable
- EU Classification (Risk Phrases): Not applicable
- EU Classification (Safety Phrases): Not applicable

16. OTHER INFORMATION

1) Reference:
   - Korea Occupational Safety & Health Agency MSDS
   - OECD SIDS
   - ChemWATCH
   - IUCLID
   - HSDB
   - IARC
   - ECOTOX
   - NITE
   - Recommendations on the transport of dangerous goods
   - NCIS
   - Emergency response guide book
   - ECOSAR
   - QSAR
   - EU RAR
   - The Chemical Database
   - ICSC
   - NIOSH Pocket guide
   - ESIS
   - ECHA CHEM
   - HPVIS
2) Print date: 1996. 06. 29
3) Number of revised/Date of last revision: 10 / 2022.01.21
4) Other: No data available