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


- 1) Product identifier: N-Par 14
- 2) Relevant identified uses of the substance or mixture and uses advised against:
 - Use in Cleaning and cleaning agents, solvents.
- 3) Manufacture/Supplier/Distributor information:
 - Manufacture information:
 - Company name: ISU CHEMICAL CO., LTD
 - Address: 8, Seokdang-gil, Onsan-eup, Ulju-gun, 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
- 2) Allocation label elements including precautionary statements
 - Hazard pictograms
 - Signal word: Danger
 - Hazard statements
 - H304: May be fatal if swallowed and enters airways.
 - Precautionary statements
 - Response
 - P301+P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
 - P331: Do not induce vomiting.
 - Storage
 - P405: Store locked up.
 - Disposal
 - P501: Dispose of contents/container to (in accordance with local/regional/national/International regulations.)
- 3) Other hazards: EUH066: Repeated exposure may cause skin dryness or cracking.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	Common name	CAS No.	Concentration (wt%)
Tetradecane	n-Tetradecane	629-59-4	≥ 99

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4. FIRST AID MEASURES

- 1) Following eye contact: Flush thoroughly with water. If irritation occurs, get medical assistance.
- 2) Following skin contact:
 - Get emergency medical attention.
 - Remove contaminated clothing and shoes.
 - Wash skin immediately with soap and water for at least 20 minutes in contact with the substance.
 - Wash contaminated clothing before reuse.
- 3) Following inhalation:
 - Remove from further exposure.
 - For those providing assistance, avoid exposure to yourself or others.
 - Use adequate respiratory protection.
 - If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance.
 - If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.
- 4) Following ingestion:
 - Seek immediate medical attention.
 - Do not induce vomiting.
- 5) Advice to physician: If ingested, material may be aspirated into the lungs and cause chemical pneumonitis.

5. FIRE FIGHTING MEASURES

- 1) Suitable (and unsuitable) extinguishing media:
 - Suitable extinguishing media: Use water fog, foam, dry chemical or carbon dioxide (CO₂) to extinguish flames.
 - unsuitable extinguishing media: Straight streams of water
- 2) Special hazards arising from the substance or mixture:
 - Hazardous Combustion Products: Smoke, Fume, Incomplete combustion products, Oxides of carbon
 - Unusual Fire Hazards: Combustible. Hazardous material.
- 3) Special protective equipment for firefighters:
 - Evacuate area. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply.
 - In the event of a tank, rail vehicle or tank truck fire, set a radius of 800 m as the initial separation distance, and consider initial evacuation in the radius of 800 m.
 - Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA).

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- Use water spray to cool fire exposed surfaces and to protect personnel.
- 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

- In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.
- Avoid contact with spilled material.
- Warn or evacuate occupants in surrounding and downwind areas if required, due to toxicity or flammability of the material.
- Be sure to ground all equipment when handling substances.
- Spray, steam or mist can pose a potential fire or explosion hazard.
- Consider initial evacuation at least 300 m in the direction of the wind.

2) Environmental precautions:

○ Large Spills

- Dyke far ahead of liquid spill for later recovery and disposal.
- Prevent entry into waterways, sewers, basements or confined areas.

3) For cleaning up

○ Land Spill:


- Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area).
- Stop leak if you can do so without risk.
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- Prevent entry into waterways, sewer, basements or confined areas.
- A vapour-suppressing foam may be used to reduce vapour.
- Use clean non-sparking tools to collect absorbed material.
- Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.

○ Large Spills:

- Water spray may reduce vapour, but may not prevent ignition in enclosed spaces.
- Recover by pumping or with suitable absorbent.

○ Water Spill:

- Stop leak if you can do so without risk.

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- Warn other shipping.
- Remove from the surface by skimming or with suitable absorbents.
- Seek the advice of a specialist before using dispersants.
- Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted.
Note: Local regulations may prescribe or limit action to be taken.


7. HANDLING AND STORAGE

1) Precautions for safe handling:

- When the material is handled in bulk, an electrical spark could ignite any flammable vapors from liquids or residues that may be present (e.g., during switch-loading operations).
- Prevent small spills and leakage to avoid slip hazard.
- Material can accumulate static charges which may cause an electrical spark (ignition source).
- Avoid contact with skin.
- Use proper bonding and/or earthing procedures. However, bonding and earthing may not eliminate the hazard from static accumulation.
- Consult local applicable standards for guidance.
- Additional references include American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practice on Static Electricity) or CENELEC CLC/TR 50404 (Electrostatics – Code of practice for the avoidance of hazards due to static electricity).
- Loading/Unloading Temperature: [Ambient]
- Transport Temperature: [Ambient]
- Static Accumulator: This material is a static accumulator.
- A liquid is typically considered a nonconductive, static accumulator if its conductivity is below 100 pS/m (100×10^{-12} Siemens per meter) and is considered a semiconductive, static accumulator if its conductivity is below 10,000 pS/m.
- Whether a liquid is nonconductive or semiconductive, the precautions are the same.
- A number of factors, for example liquid temperature, presence of contaminants, anti-static additives and filtration can greatly influence the conductivity of a liquid.

2) Conditions for safe storage (including any incompatibilities):

- The container choice, for example storage vessel, may effect static accumulation and dissipation.
- Keep container closed. Handle containers with care.
- Open slowly in order to control possible pressure release.
- Store in a cool, well-ventilated area.
- Storage containers should be earthed and bonded.

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- Fixed storage containers, transfer containers and associated equipment should be earthed and bonded to prevent accumulation of static charge.
- Storage Temperature: [Ambient]
- Storage Pressure: [Ambient]
- Suitable Containers/Packing: Tank Cars; Tank Trucks; Barges; Drums
- Suitable Materials and Coatings (Chemical Compatibility): Carbon Steel; Stainless Steel; Polyethylene; Polypropylene; Polyester; Teflon
- Unsuitable Materials and Coatings: Natural Rubber; Butyl Rubber; Polystyrene; Ethylene-propylene-diene monomer (EPDM)

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

1) Chemical exposure limits, Biological exposure standard:

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

2) Appropriate engineering controls:

- The level of protection and types of controls necessary will vary depending upon potential exposure conditions.
- Control measures to consider: Adequate ventilation should be provided so that exposure limits are not exceeded. Use explosion-proof ventilation equipment.

3) Personal protection equipment:


○ Respiratory protection:

- If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate.
- Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include: Half-face filter respirator Type A filter material, European Committee for Standardization (CEN) standards EN 136, 140 and 405 provide respirator masks and EN 149 and 143 provide filter recommendations.
- For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode.
- Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapour warning properties are poor, or if air purifying filter capacity/rating may be exceeded

○ Eye protection: If contact is likely, safety glasses with side shields are recommended.

○ Hand protection:

- Any specific glove information provided is based on published literature and glove manufacturer data.

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- Glove suitability and breakthrough time will differ depending on the specific use conditions.
- Contact the glove manufacturer for specific advice on glove selection and Breakthrough times for your use conditions.
- Inspect and replace worn or damaged gloves.
- Chemical resistant gloves are recommended.
- Nitrile, CEN standards EN 420 and EN 374 provide general requirements and lists of glove types.
- Body protection:
 - Any specific clothing information provided is based on published literature or manufacturer data.
 - The types of clothing to be considered for this material include: Chemical/oil resistant clothing is recommended.

9. PHYSICAL AND CHEMICAL PROPERTIES

- 1) Appearance(Physical state, color, etc): Liquid, colourless
- 2) Odour: faint
- 3) Oder threshold: No data available
- 4) pH: 7
- 5) Melting point/freezing point: 6℃ at 1 atm
- 6) Initial boiling point and boiling range: 244-250℃
- 7) Flash point: 112℃
- 8) Evaporation rate: No data available
- 9) Flammability(solid, gas): No data available
- 10) Upper/lower flammability or explosive limits: 2.5 / 0.6 %
- 11) Vapour pressure: 5 Pa at 20℃
- 12) Solubility(ies): 0.00278 mg/L at 25℃
- 13) Vapour density: 6.4
- 14) Relative density: 0.7663 (15℃/ 4℃)
- 15) n-octanol/water partition coefficient: 8.11 Log Pow
- 16) Auto ignition temperature: 220 ℃ at 1 atm
- 17) Decomposition temperature: No data available
- 18) Viscosity: 2.08 cSt at 40℃
- 19) Molecular weight(mass): 198

10. STABILITY AND REACTIVITY

- 1) Stability and hazardous reactivity:
 - Material is stable under normal conditions.
- 2) Conditions to avoid:

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– Avoid heat, sparks, open flames and other ignition sources.

3) Incompatible materials:

– Strong oxidisers

4) Hazardous decomposition products:

– Material does not decompose at ambient temperatures.

– Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

1) Exposure route information : No data available

2) Health hazard information

○ Acute toxicity:

– Oral: LD50 > 15,000mg/kg 24h in Rat OECD Guideline 401

– Dermal: LD50 >= 3,160 mg/kg 14D in Rabbit OECD Guideline 402

– Inhalation: LC50 > 6,100 mg/m³ 4h in Rat OECD Guideline 403

○ Skin corrosion/Irritation: Rabbit/skin: No irritation, OECD Guideline 404 (Acute Dermal Irritation / Corrosion)

○ Serious eye damage/irritation: Rabbit/Eye: No irritation, OECD Guideline 405 (Acute Eye Irritation / Corrosion)

○ Respiratory sensitization: No data available

○ Skin sensitization: Based on the scores of dermal irritation, test substance MRD-83-205 would not be considered a dermal sensitizer under the EU GHS guide lines or under the EU requirements for dangerous substances and preparations guidelines, OECD Guideline 406 (Skin Sensitisation)

○ Carcinogenicity: The available data and available weight of evidence demonstrate that the C9-C14 aliphatic, <2% aromatics are highly unlikely to be carcinogenic and are not classifiable as carcinogens.


○ Germ cell mutagenicity: In Vitro – Salmonella typhimurium/TA98, TA100, TA1535, Ta1537, TA1538 (return stone stool mutation test) (OECD TG 471, GLP): Negative (negative), CHL Cells/Nonvariablemetabolites: Inactive metabolites, non-active metabolites:

○ Reproductive toxicity: Decalin exposure had no effect on sperm parameters of estrous cycle in male and female rats. NOAEC for fertility in both sexes ≥ 400 ppm (highest concentration tested), other: OECD TG 413

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

○ Specific target organ toxicity (repeated exposure): 20 Weeks Repeated Exposure
LOAEL=9600 mg/kg bw/day to mouse skin

○ Aspiration hazard: Hydrocarbon material with a kinematic viscosity of 2.08 mm²/s at 40°C and may be Aspiration hazard (GLP)

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12. ECOLOGICAL INFORMATION


- 1) Aquatic toxicity:
 - Fish: LL50 > 1,000 mg/L, Oncorhynchus mykiss, OECD 203, 96hr
 - Crustacean: EC50 > 1,000 mg/L, D. magna, C. marinus, Mysidopsis bahia, 48hr
 - Aquatic algae: EL50 > 1,000 mg/L, Pseudokirchneriella subcapitata, OECD 201, 72hr
- 2) Persistence and degradation:
 - residual: No data available
 - resolvability: 69%(28d)
- 3) Bioaccumulative potential:
 - condensability: BCF of 962.9 L / kg
 - biodegradability: No data available
- 4) Mobility in soil: No data available
- 5) Other adverse effects: No data available

13. DISPOSAL CONSIDERATIONS

- 1) Disposal methods:
 - Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.
 - Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.
- 2) Precautions (including disposal of contaminated container of package):
 - Empty Container Warning Empty Container Warning (where applicable):
 - Empty containers may contain residue and can be dangerous.
 - Empty drums should be completely drained and safely stored until appropriately.
 - Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations.
 - Do Not Pressurise, Cut, Weld, Braze, Solder, Drill, Grind or Expose Such Containers to Heat, Flame, Sparks, Static Electricity, or Other Sources of Ignition.
 - They May Explode and cause Injury or death
 - Do not attempt to refill or clean containers without proper instructions.

14. TRANSPORT INFORMATION

- 1) UN No.: Not Regulated
- 2) Proper shipping name: Not applicable
- 3) Class or division: Not applicable
- 4) Packing group: Not applicable

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- 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
4) Wastes Control Act in Korea: Not applicable
5) Wastes Control Act in EU:
– European Waste Code: 08 XX XX
– NOTE: These codes are assigned based upon the most common uses for this material and may not reflect contaminants resulting from actual use. Waste producers need to assess the actual process used when generating the waste and its contaminants in order to assign the proper waste disposal code(s).
6) Other regulations in KOREA and Abroad regulations:
○ Other regulation (Domestic): Not applicable
○ National regulations:
– U.S.A. management information(OSHA regulation): Not applicable
– U.S.A. management information(CERCLA regulation): Not applicable
– 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(Montreal 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:
– ECHA [CHEM](#)
– Korea Occupational Safety & Health Agency MSDS
2) Date of initial completion: 2020. 07. 08
3) Number of revised/Date of last revision: 1 / 2022. 03. 04
4) Other: No data available