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

- 1) Product identifier: NDM
- 2) Relevant identified uses of the substance or mixture and uses advised against:
 - ☐ Recommended use: Polymerization for styrene- butadiene rubber; Complexes such as metal removal from waste; Manufacture of synthetic rubber, plastics,; Nonionic detergent, Disinfectant manufacturing
 - ☐ Removal of use: No data available
- 3) Manufacture/ Supplier/ Distributor information:
 - ☐ Manufacture information:




Company name: ISU SPECIALTY CHEMICAL CO., LTD


Address: 8, Seokdang- gil, Onsan- eup, Ulju- gun, Ulsan, Korea

Emergency telephone number: Tel. 052- 231- 5582 Fax. 052- 231- 5699

2. HAZARD IDENTIFICATION

- 1) Hazard classification:
 - ☐ Skin irritability, Category 1
 - ☐ Skin corrosion / skin irritation Category 1
 - ☐ Severe eye damage, Category 1
 - ☐ Acute aquatic environment hazard, Category 1
 - ☐ Chronic aquatic environment hazard, Category 1
- 2) Allocation label elements including precautionary statements
 - ☐ Hazard pictograms:




 - ☐ Signal word: danger
 - ☐ Hazard statements
 - H314 : Causes severe skin burns and eye damage.
 - H318 : Causes severe eye damage.
 - H317 : May cause allergic skin irritation
 - H400 : Very toxic to aquatic organisms
 - H410 : Very toxic to aquatic organisms in long- term contact.
 - ☐ Precautionary statements
 - Prevention:
 - P260 : Do not breathe dust(Dust, fume, gas, mist, vapors, 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.

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- P273 : Avoid release to the environment.
- P280 : Wear protective gloves/protective clothing/eye protection/face protection.
- Response:
 - P302+P352 : Wash with plenty of soap and water.
 - P333+P313 : If skin irritation or rash occurs, seek medical attention.
 - P321 : First aid measures such as washing your skin and eyes with water
- P362+P364 : Remove contaminated clothing and wash before reuse.
- P301 + P330 + P331 : If swallowed, wash your mouth. Do not try to vomit.
- P303 + P361 + P353 : If skin (or hair) gets on, remove all contaminated clothing.
Wash skin with soap and water.
- P363 : Wash contaminated clothing before reuse
- P304+P340 : If inhaled, remove to fresh air and keep at rest in a position comfortable for breathing.
- P310 : Immediately call a POISON CENTER or doctor / physician.
- P305+P351+P338 : IF IN EYES: Rinse cautiously with water for several minutes.
Remove contact lenses, if present and easy to do. Continue rinsing
- P391 : Collect the spills.
- Storage:
 - P405 : Store in lockable storage
- 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%)
1-Dodecanethiol	1-Dodecyl mercaptan	112-55-0	98.5~100

※ <1.5% by- product

Within the current knowledge of the supplier, Also within the applicable concentration
Classified as a hazard to health or the environment This product does not contain any
additives that should be reported in this section.

4. FIRST AID MEASURES

1) Following eye contact:

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- Small spills on the eyes may cause irreversible damage to the tissue, resulting in blindness.
- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- Continue to rinse your eyes with water as you move to hospital.
- Remove contact lenses.
- If eye irritation persists, seek medical advice.

2) Following skin contact:

- If skin irritation persists, seek medical advice.
- In case of contact with skin, wash with water.
- If it gets on your clothes, take off your clothes.
- If you do not cure skin corrosion, it will not heal easily and your recovery will be slow.

3) Following inhalation:

- If you lose consciousness, lay it down properly and seek a doctor.
- If symptoms persist, seek medical advice.

4) Following ingestion:

- Clear your prayers.
- Do not feed anything to an unconscious person.
- Transfer the patient to the hospital immediately.

5) Advice to physician:

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

5. FIRE FIGHTING MEASURES

1) Suitable (and unsuitable) extinguishing media:


- Dry chemical agent, foam, alcohol resistant foam, water spray, carbon dioxide
- Inadequate digestive medicine: use of high-pressure water

2) Special hazards arising from the substance or mixture:

- Do not let runoff from digestion work into sewer or drain.
- Generation of carbon oxides, sulfur oxides, which are harmful substances in decomposition.

3) Special protective equipment for firefighters:

- Wear self contained breathing apparatus for fire fighting if necessary.
- Collect contaminated fire water separately.
- Do not let this fire water drain into the drain.
- Dispose of fire residues and contaminated fire extinguishing water according to local regulations.

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6. ACCIDENTAL RELEASE MEASURES

- 1) Health considerations and protective equipment:
 - Wear personal protective equipment.
 - Allow proper ventilation.
- 2) Environmental precautions:
 - Do not allow product to enter drains.
 - Make sure there are no more leaks or spills in a safe way.
 - Report to the authorities when the product is contaminated with rivers, lakes or sewage.
- 3) For cleaning up:
 - Absorb with an inert absorbent material such as sand, silica gel, acid binders, common binders, sawdust, etc. and collect them.
 - Store in a tightly closed container for disposal.

7. HANDLING AND STORAGE


- 1) Precautions for safe handling:
 - Place bottles in a metal tray to prevent leakage during handling.
 - Do not breathe vapor or dust.
 - For personal protection see section 8.
 - Do not smoke, eat or drink in your area.
 - Dispose of the rinse water according to local and national government regulations.
 - Persons susceptible to skin sensitization, asthma, allergies, chronic or recurrent respiratory illness should not be admitted to the process in which this product is used.
- 2) Conditions for safe storage (including any incompatibilities):
 - Keep container tightly closed and dry and in a well- ventilated place.
 - Re- seal the opened container carefully and prevent it from leaking.
 - Electrical equipment / work materials comply with technical safety standards.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

- 1) Chemical exposure limits, Biological exposure standard:

Components	Occupational exposure limits (Domestic)	ACGIH	Biological limit values
1-Dodecanethiol	No data available	TWA 0.1 ppm	Not applicable

- 2) Appropriate engineering controls:
 - When selecting engineering controls and personal protective equipment, consider exposure limits, work activities and other substances in the workplace that are subject to the potential hazards of the substance (see section Hazards and Hazards)

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- Ventilate adequately to control airborne concentrations below exposure limits
- If engineering controls or work practices are not appropriate to prevent exposure to hazardous levels of the material, use the personal protective equipment listed below.
- Since protection is generally possible in a limited time or under certain circumstances, The user should read and understand all instructions and restrictions provided with the equipment.

3) Personal protection equipment:

- Respiratory protection:
 - If you are exposed to hazardous substances, wear a mask approved by the Korea Occupational Safety and Health Agency for the protection of work.
 - If ventilation or other engineering controls are not adequate to maintain a minimum oxygen content of 19.5% per volume at normal atmospheric pressure, wear a black ("inside") mask from KOSHA.
 - Air purification mask for organic steam. In the unlikely event of uncontrolled release, exposure levels not being known, or where the air- purifying mask does not provide adequate protection, use a positive- pressure air- supplied respirator.
- Eye protection:
 - Use chemical protective glasses and face shield.
 - Provide emergency showers and eyewash.
 - Protective eyewear designed to protect against harmful liquids. Wear safety glasses that can be used overwrite
- Hand protection:
 - Consult with the manufacturer of the protective gloves for their suitability for use in certain workplaces.
 - Observe the instructions on permeability and destruction time provided by the glove supplier.
 - Consider the specific site conditions in which the product is to be used, such as cutting hazards, wear and contact time.
 - Gloves should be discarded if disassembled or chemicals have penetrated.
- Body protection:
 - Wear protective equipment appropriate to the type of protective equipment, concentration and amount of dangerous substances, and the conditions of the particular workplace.
 - Use full protection of head, face and neck, rubber apron, chemical resistant protection footwear

9. PHYSICAL AND CHEMICAL PROPERTIES

- 1) Appearance(Physical state, color, etc): Colorless liquide
- 2) Oder: A skunk smell

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- 3) Oder threshold: 0.48 ppm
- 4) pH: No data available
- 5) Melting point/freezing point: - 8 °C
- 6) Initial boiling point and boiling range: 266- 285 °C
- 7) Flash point: 126 °C
- 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: 0.00853 mmHg @ 25 °C
- 12) Solubility(ies): 0.7563 mg/L @ 20 °C (Water solubility: insoluble)
- 13) Vapour density: 7.0
- 14) Relative density: 0.849((16C))
- 15) n- octanol/water partition coefficient: 6.18(Estimate)
- 16) Auto ignition temperature: 230 °C
- 17) Decomposition temperature: No data available
- 18) Viscosity: No data available
- 19) Molecular weight(mass): 202.41

10. STABILITY AND REACTIVITY

- 1) **Stability and hazardous reactivity:**
This material does not cause adverse reactions when handled at the recommended temperature and storage conditions.
- 2) Conditions to avoid: Ignition source(heat, spark, flame)
- 3) Incompatible materials: May react with strong oxidizing agents such as oxygen and chlorates, nitrates, peroxides and the like.
- 4) Hazardous decomposition products: Carbon oxides, sulfur oxides

11. TOXICOLOGICAL INFORMATION

- 1) Exposure route information
 - Short term exposure may cause irritation, nausea, difficulty breathing, headache, bluish skin color, and convulsions.
 - Short term exposure may cause gastritis, headache, convulsions, and coma.
 - Short term, long term exposure may cause irritation, allergic reactions.
 - Short- term, long- term exposure to irritation.
- 2) Health hazard information
 - Acute toxicity:
 - Oral: LD50>5000 mg/kg (Rat)
 - Dermal: LD50 5600 mg/kg (Rabbit)

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- Inhalation(Vapor): Not applicable
- ☐ Skin corrosion/Irritation:
 - Extremely corrosive and destructive to tissue.
- ☐ Serious eye damage/irritation:
 - May cause irreversible eye damage.
- ☐ Respiratory sensitization:
 - No data available
- ☐ Skin sensitization:
 - May cause sensitization by skin contact.
- ☐ Carcinogenicity:
 - Not applicable
- ☐ Germ cell mutagenicity:
 - Not applicable
- ☐ Reproductive toxicity:
 - Not applicable
- ☐ Specific target organ toxicity (single exposure):
 - Not applicable
- ☐ Specific target organ toxicity (repeated exposure):
 - Skin allergy, skin tickling, exanthema.
- ☐ Aspiration hazard:
 - May be harmful if swallowed and enters airway

12. ECOLOGICAL INFORMATION

- 1) Aquatic toxicity:
 - Fish: LC50 100 mg/L 96hr Oncorhynchus mykiss
 - Crustacean: EC50 1- 10mg/l 48hr Daphnia magna
 - Aquatic algae: EC50 0.0145 mg/L 72hr Pseudokirchneriella subcapitata
- 2) Persistence and degradation: log Kow 6.18(Estimate)
- 3) Bioaccumulative potential: Bioconcentration factor (BCF): 234 (Estimate based on individual component values)
- 4) Mobility in soil: Not applicable
- 5) Other adverse effects:
 - Environmental hazards can not be excluded if they are handled or disposed of by non-experts. Very toxic to aquatic organisms due to long- term effects.

13. DISPOSAL CONSIDERATIONS

- 1) Disposal methods:
 - Dispose of contents and container in accordance with local regulations.
- 2) Precautions (including disposal of contaminated container of package):

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- Do not allow product to enter drains, water courses, or the soil.
- Do not contaminate ponds, waterways or ditches with chemical- based containers.
- Handle in a licensed waste management company.


14. TRANSPORT INFORMATION

- 1) UN No.: 1760
- 2) Proper shipping name: CORROSIVE LIQUIDS, N.O.S,(N- DODECYL MERCAPTAN)
- 3) Class or division: 8
- 4) Packing group: III
- 5) Marine pollutant: Not applicable
- 6) Special safety response for transportation or transportation measure: Not applicable
 - Emergency measures in case of fire : F- A
 - Emergency measures in the effluent : S- B

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(Non- aqueous) 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): 453.599(kg)
 - 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): Available
 - 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

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- 1) Reference:
 - Korea Occupational Safety & Health Agency MSDS 2018
 - ECHA
- 2) Print date: 2023 .06. 15
- 3) Number of revised/Date of last revision: 0
- 4) Other: No data available