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|---|-----------------------------------|--------|------------|------|-----|
|  | Material Safety Data Sheet (MSDS) | Rev.No | | 0 | |
| | D-SOL 280 | DATE | 2023.06.15 | PAGE | 1/8 |

* MSDS Registration No. : AA01312-0000000072

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

- 1) Product identifier: D- 280
- 2) Relevant identified uses of the substance or mixture and uses advised against:
 - Relevant identified uses: Cleaning and cleaning agents, anti- corrosion agents, heat transfer agents, lubricants and additives
 - Uses advised against: 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. +82 52 231 5582 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 .
- 3) Other hazards: NFPA Grade: Not applicable

3. COMPOSITION/INFORMATION ON INGREDIENTS

| Components | Common name | CAS No. | Concentration (wt%) |
|--|--|--|---------------------|
| Distillates (petroleum), hydrotreated light paraffinic | Hydrotreated kerosene, Distillate fuel | CAS No. 64742- 55- 8 EC No. 265- 158- 7 | 100 |

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|---|-----------------------------------|--------|------------|------|-----|
|  | Material Safety Data Sheet (MSDS) | Rev.No | | 0 | |
| | D-SOL 280 | DATE | 2023.06.15 | PAGE | 2/8 |

* MSDS Registration No. : AA01312-0000000072


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|--|--|-------------|--|--|--|
| | | oils, light | | | |
|--|--|-------------|--|--|--|

4. FIRST AID MEASURES

- 1) Following eye contact:
 - In case of contact with material, immediately flush eyes with running water for at least 15 minutes.
 - Seek immediate medical assistance.
- 2) Following skin contact:
 - In case of contact with material, immediately flush skin with running water for at least 15 minutes.
 - Remove and isolate contaminated clothing and shoes.
 - For minor skin contact, avoid spreading material on unaffected skin.
 - Seek immediate medical assistance.
- 3) Following inhalation:
 - If exposed or concerned, get medical advice/attention.
 - Move to fresh air.
 - Do not use mouth- to- mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one- way valve or other proper respiratory medical device.
 - Keep it warm and stable.
- 4) Following ingestion:
 - If exposed or concerned, get medical advice/attention.
 - Do not use mouth- to- mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one- way valve or other proper respiratory medical device.
- 5) Advice to physician:
 - Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
 - Exposures require specialized first aid with contact and medical follow- up.

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:
 - 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.

| | | | | | |
|---|-----------------------------------|--------|------------|------|-----|
|  | Material Safety Data Sheet (MSDS) | Rev.No | | 0 | |
| | D-SOL 280 | DATE | 2023.06.15 | PAGE | 3/8 |

* MSDS Registration No. : AA01312-0000000072

3) Special protective equipment for firefighters:

- Rescuers should put on appropriate protective gear.
- Evacuate area and fight fire from a safe distance.
- Substance may be transported in a molten form.
- 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.
- Isolate a contaminated area.
- Keep unnecessary and unprotected personnel from entering.
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- 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.
- Please note that materials and conditions to be avoided.

2) Environmental precautions:

- Prevent entry into waterways, sewers, basements or confined areas.


3) For cleaning up:

- Absorb spill with inert material (e.g., dry sand or earth), then place in a chemical waste container.
- Reduce airborne dust and prevent scattering by moistening with water.
- Absorb the liquid and scrub the area with detergent and water

7. HANDLING AND STORAGE

1) Precautions for safe handling:

- Follow all MSDS/label precautions even after container is emptied because they may retain product residues.

| | | | | | |
|---|-----------------------------------|--------|------------|------|-----|
|  | Material Safety Data Sheet (MSDS) | Rev.No | | 0 | |
| | D-SOL 280 | DATE | 2023.06.15 | PAGE | 4/8 |

* MSDS Registration No. : AA01312-0000000072

- Use care in handling/storage.
 - Loosen closure cautiously before opening.
 - Please note that materials and conditions to be avoided.
 - Do not handle until all safety precautions have been read and understood.
 - Avoid breathing dust/fume/gas/mist/vapors/spray.
 - Use only outdoors or in a well-ventilated area.
- 2) Conditions for safe storage (including any incompatibilities):
- Empty drums should be completely drained, properly bunged, and promptly returned to a drum reconditioner, or properly disposed of.
 - Store in a closed container.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

1) Chemical exposure limits, Biological exposure standard:

| Components | Occupational exposure limits (Domestic) | ACGIH | Biological limit values |
|--|---|-------------------|-------------------------|
| Distillates(petroleum),hydrotreated light paraffinic | No data available | No data available | No data available |

2) Appropriate engineering controls:


- Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

3) Personal protection equipment:

- Respiratory protection:
 - Under conditions of frequent use or heavy exposure, respiratory protection may be needed.
 - Wear a NIOSH/OSHA approved respirator.
- Eye protection:
 - Wear suitable protective goggles and face shields.
 - Provide emergency showers and eyewash.
- Hand protection:
 - Wear suitable protective gloves.
- Body protection:
 - Wear suitable protective clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

- 1) Appearance(Physical state, color, etc): Colorless liquid
- 2) Odor: Diesel odor
- 3) Odor threshold: No data available

| | | | | | |
|---|-----------------------------------|--------|------------|------|-----|
|  | Material Safety Data Sheet (MSDS) | Rev.No | | 0 | |
| | D-SOL 280 | DATE | 2023.06.15 | PAGE | 5/8 |

* MSDS Registration No. : AA01312-0000000072


- 4) pH: No data available
- 5) Melting point/freezing point: 0℃ at 101.325kPa
- 6) Initial boiling point and boiling range: 287 ~ 317℃
- 7) Flash point: 140℃
- 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: <0.1 hPa at 20℃
- 12) Solubility(ies): <1 mg/L at 20℃
- 13) Vapour density: No data available
- 14) Relative density: 0.80~ 0.90 @ 20℃
- 15) n- octanol/water partition coefficient: 1.99 ~ 18.02 at 20℃
- 16) Auto ignition temperature: No data available
- 17) Decomposition temperature: No data available
- 18) Viscosity: 5.0 ~ 6.0 cSt at 40℃
- 19) Molecular weight(mass): No data available

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.
- 2) Conditions to avoid:
 - Ignition source(heat, spark, flame)
- 3) Incompatible materials:
 - Combustibles, reducing material
- 4) Hazardous decomposition products:
 - Oxides of carbon.

11. TOXICOLOGICAL INFORMATION

- 1) Exposure route information
 - The substance can be absorbed into the body by inhalation of its vapour and by ingestion.
- 2) Health hazard information
 - Acute toxicity:
 - Oral: LD50 > 5,000 mg/kg (Rat, OECD TG 401, GLP)
 - Eye/Skin: LD50 > 5,000 mg/kg (Rabbit, OECD TG 402, GLP)
 - Inhalation (gas): No data available


| | | | | | |
|---|-----------------------------------|--------|------------|------|-----|
|  | Material Safety Data Sheet (MSDS) | Rev.No | | 0 | |
| | D-SOL 280 | DATE | 2023.06.15 | PAGE | 6/8 |

* MSDS Registration No. : AA01312-0000000072

- Inhalation (vapour): LC50>5mg/L (Rat, 4H, OECD TG 403, GLP)
- Inhalation (mist): No data available
- Skin corrosion/Irritation: (Cat. 2)
 - Non- irritating (Rabbit, OECD TG 404, GLP)
- Serious eye damage/irritation:
 - Non- irritating (Rabbit, OECD TG 405, GLP)
- Respiratory sensitization:
 - Not sensitizing (Guinea pig)
- Skin sensitization:
 - Not sensitizing (Guinea pig, OECD TG 406, GLP)
- Carcinogenicity:
 - Not classified (Mouse, Similar to OECE TG451)
- Germ cell mutagenicity:
 - In vitro - (Similar to OECD TG 473): Negative
 - OECD Guideline 471 (Bacterial Reverse Mutation Assay): Negative
 - In vivo - (OECD TG 474): Negative
- Reproductive toxicity:
 - At rat inhalation test, There was no evidence of any adverse compound effect on the dams, nor was there evidence of compound-induced terata, variation in sex ratio, embryotoxicity or inhibition of foetal growth and development.
 - Teratogenic test (NOAEL = 1000 mg/kg/day, OECD TG 414)
 - Reproductive Toxicity (NOAEL = 1000 mg/kg/day, OECD TG 416)
- Specific target organ toxicity (single exposure):
 - Not classified.
- Specific target organ toxicity (repeated exposure):
 - Not classified.
- Aspiration hazard: (Cat. 1)
 - Kinematic viscosity: about 3.58 cSt (centistokes)

12. ECOLOGICAL INFORMATION

- 1) Aquatic toxicity:
 - Fish : fathead minnow, LL50(96hr) > 100 mg/L, NOEL(96hr) ≥ 100 mg/L
 - Water fleas: Daphnia magna, EL50(48hr): > 10,000 mg/L, NOEL ≥ 10,000 mg/L
 - Alga: Pseudokirchneriella subcapitata, NOEL ≥ 100mg/L
- 2) Persistence and degradation:
 - Not readily biodegradable
 - Log Kow= 1.99 ~ 18.02
- 1) Bioaccumulative potential: 0.4~ 6,280 L/kg
- 2) Mobility in soil: No data
- 3) Other adverse effects: No data

| | | | | | |
|---|-----------------------------------|--------|------------|------|-----|
|  | Material Safety Data Sheet (MSDS) | Rev.No | | 0 | |
| | D-SOL 280 | DATE | 2023.06.15 | PAGE | 7/8 |

* MSDS Registration No. : AA01312-0000000072

13. DISPOSAL CONSIDERATIONS


- 1) Disposal methods:
 - Incinerate separated oil from oil and water, and treat the remaining water after separating at the water pollution control facilities.
 - Incinerate or stabilize residue treated by evaporation•concentration.
 - Incinerate residue treated by agglomeration•precipitation.
 - Refine by Separation•distillation•extraction•filtration•pyrolysis.
 - Incinerate or stabilize residue.
- 2) Precautions (including disposal of contaminated container of package):
 - Dispose of contents/container according to the relevant laws and regulations.

14. TRANSPORT INFORMATION

- 1) UN No.: Not applicable
- 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
- 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
 - 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

| | | | | | |
|---|-----------------------------------|--------|------------|------|-----|
|  | Material Safety Data Sheet (MSDS) | Rev.No | | 0 | |
| | D-SOL 280 | DATE | 2023.06.15 | PAGE | 8/8 |

* MSDS Registration No. : AA01312-0000000072

- EU Classification (Classification): Asp. Cat. 1; R65
- EU Classification (Risk Phrases): R65
- EU Classification (Safety Phrases): S2, S23, S24, S62

16. OTHER INFORMATION

1) Reference:

- Safety and Health Corporation MSDS Notice of Ministry of Labor 2014- 12
- 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
- RTECS
- NIOSH Pocket guide
- ESIS
- HPVIS

2) Print date: 2023. 06. 15

3) Number of revised/Date of last revision: 0

4) Other: No data available