MATERIAL SAFETY DATA SHEET (MSDS)

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form : Substance
EC index no : 616-001-00-X
EC no : 200-679-5
CAS No : 68-12-2
Product code : 00118
Formula : C3H7NO
Chemical structure :

\[
\begin{align*}
\text{H} & \quad \text{N} \quad \text{CH}_3 \\
\text{O} & \quad \text{CH}_3
\end{align*}
\]

Synonyms : DMF

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

Use of the substance/mixture : Laboratory chemicals, Manufacture of substances

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

LOBA CHEMIE PVT.LTD,
107 Wode House Road, Jehangir Villa, Colaba
400005 Mumbai - INDIA
T +91 22 6663 6663 - F +91 22 6663 6699
info@lobachemie.com - www.lobachemie.com

1.4. Emergency telephone number

Emergency number : + 91 22 6663 6663 (9:00am - 6:00 pm)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Flammable liquids, Category 3 : H226
Acute toxicity (dermal), Category 4 : H312
Acute toxicity (inhal.), Category 4 : H332
DIMETHYLFORMAMIDE AR/ACS
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Serious eye damage/eye irritation, Category 2
Reproductive toxicity, Category 1B

Full text of classification categories and H statements: see section 16

Classification according to Directive 67/548/EEC or 1999/45/EC
Repr. Cat.2; R61
Xn; R20/21
Xi; R36
Full text of R-phrases: see section 16

Adverse physicochemical, human health and environmental effects
No additional information available

2.2. Label elements

Labeling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP):

- GHS02
- GHS07
- GHS08

Signal word (CLP): Danger
Hazard statements (CLP):
- H226 - Flammable liquid and vapour
- H312+H332 - Harmful in contact with skin or if inhaled
- H319 - Causes serious eye irritation
- H360D - May damage the unborn child

Precautionary statements (CLP):
- P201 - Obtain special instructions before use
- P280 - Wear protective gloves/protective clothing/eye protection/face protection
- P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
- P308+P313 - IF exposed or concerned: Get medical advice/attention

2.3. Other hazards

This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII
This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

SECTION 3: Composition/information on ingredients

3.1. Substance

Name: DIMETHYLFORMAMIDE AR/ACS
CAS No: 68-12-2
EC no: 200-679-5
EC index no: 616-001-00-X
Full text of R- and H-phrases: see section 16

3.2. Mixture
Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures
First-aid measures general: IF exposed or concerned: Get medical advice/attention.
First-aid measures after inhalation: Remove person to fresh air and keep comfortable for breathing. Give oxygen or artificial respiration if necessary. If you feel unwell, seek medical advice.
First-aid measures after skin contact: Immediately call a POISON CENTER or doctor/physician. Wash with plenty of soap and water. Wash contaminated clothing before reuse.
First-aid measures after eye contact: 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.
First-aid measures after ingestion: Rinse mouth out with water. If you feel unwell, seek medical advice.

4.2. Most important symptoms and effects, both acute and delayed
Symptoms/injuries: May damage the unborn child.
Symptoms/injuries after skin contact: Repeated exposure to this material can result in absorption through skin causing significant health hazard. Harmful in contact with skin.
Symptoms/injuries after eye contact: Causes serious eye irritation.

4.3. Indication of any immediate medical attention and special treatment needed
Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media
Suitable extinguishing media: dry chemical powder, alcohol-resistant foam, carbon dioxide (CO2).
Unsuitable extinguishing media: Do not use a heavy water stream.

5.2. Special hazards arising from the substance or mixture
No additional information available

5.3. Advice for firefighters
Protection during firefighting: Do not attempt to take action without suitable protective equipment.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
6.1.1. For non-emergency personnel
Emergency procedures: Evacuate unnecessary personnel.

6.1.2. For emergency responders
Protective equipment: Use personal protective equipment as required.
Emergency procedures: Stop release.

6.2. Environmental precautions
Avoid release to the environment.

6.3. Methods and material for containment and cleaning up
Methods for cleaning up: Collect spillage. On land, sweep or shovel into suitable containers. Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible.
6.4. Reference to other sections
No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Precautions for safe handling : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood.
Hygiene measures : Wash ... thoroughly after handling.

7.2. Conditions for safe storage, including any incompatibilities
Storage conditions : Store in original container. Keep container tightly closed. Store in a dry place. Protect from moisture.

7.3. Specific end use(s)
No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters
No additional information available

8.2. Exposure controls
Hand protection : protective gloves
Eye protection : Chemical goggles or safety glasses
Skin and body protection : Wear suitable protective clothing
Respiratory protection : Wear respiratory protection

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties
Physical state : Liquid
Colour : Clear Colorless.
Odour : fishy pungent & amine like.
Odour threshold : No data available
pH : 6.7
Relative evaporation rate (butylacetate=1) : 0.17
Melting point : -61 °C
Freezing point : No data available
Boiling point : 153 °C
Flash point : 580 °C
Auto-ignition temperature : 4450 °C
Decomposition temperature : No data available
DIMETHYLFORMAMIDE AR/ACS
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<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammability (solid, gas)</td>
<td>Flammable</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>2.7 at 20°C</td>
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<tr>
<td>Relative vapour density at 20 °C</td>
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<tr>
<td>Relative density</td>
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<td>Density</td>
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<tr>
<td>Solubility</td>
<td>Water: Complete</td>
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<td>Log Pow</td>
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<td>Viscosity, kinematic</td>
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</tr>
<tr>
<td>Viscosity, dynamic</td>
<td>No data available</td>
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<tr>
<td>Explosive properties</td>
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<tr>
<td>Oxidising properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosive limits</td>
<td>0.022 - 0.152 vol %</td>
</tr>
</tbody>
</table>

9.2. Other information
No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity
No additional information available

10.2. Chemical stability
Stable under normal conditions.

10.3. Possibility of hazardous reactions
No additional information available

10.4. Conditions to avoid
Direct sunlight. Air contact. Moisture.

10.5. Incompatible materials
No additional information available

10.6. Hazardous decomposition products
No additional information available

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity: Dermal: Harmful in contact with skin. Inhalation: Harmful if inhaled.

Skin corrosion/irritation: Not classified
pH: 6.7

Serious eye damage/irritation: Causes serious eye irritation.
pH: 6.7

Respiratory or skin sensitisation: Not classified

Germ cell mutagenicity: Not classified

Carcinogenicity: Not classified
Reproductive toxicity: May damage the unborn child.
Specific target organ toxicity (single exposure): Not classified
Specific target organ toxicity (repeated exposure): Not classified
Aspiration hazard: Not classified

Potential adverse human health effects and symptoms: Harmful in contact with skin.

SECTION 12: Ecological information

12.1. Toxicity
No additional information available

12.2. Persistence and degradability
No additional information available

12.3. Bioaccumulative potential

<table>
<thead>
<tr>
<th>DIMETHYLFORMAMIDE AR/ACS (68-12-2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log Pow</td>
</tr>
</tbody>
</table>

12.4. Mobility in soil
No additional information available

12.5. Results of PBT and vPvB assessment

<table>
<thead>
<tr>
<th>DIMETHYLFORMAMIDE AR/ACS (68-12-2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII</td>
</tr>
<tr>
<td>This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII</td>
</tr>
</tbody>
</table>

12.6. Other adverse effects
No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods
Product/Packaging disposal recommendations: Dispose of contents/container to...

SECTION 14: Transport information
In accordance with ADR / RID / IMDG / IATA / ADN
14.1. UN number

| UN-No. (ADR) | : 2265 |
| UN-No. (IMDG) | : 2265 |
| UN-No.(IATA) | : 2265 |
| UN-No.(ADN) | : 2265 |
| UN-No. (RID) | : 2265 |

14.2. UN proper shipping name

| Proper Shipping Name (ADR) | : N,N-DIMETHYLFORMAMIDE |
| Proper Shipping Name (IMDG) | : N,N-DIMETHYLFORMAMIDE |
| Proper Shipping Name (IATA) | : N,N-DIMETHYLFORMAMIDE |
| Proper Shipping Name (ADN) | : N,N-DIMETHYLFORMAMIDE |
| Proper Shipping Name (RID) | : N,N-DIMETHYLFORMAMIDE |

| Transport document description (ADR) | : UN 2265 N,N-DIMETHYLFORMAMIDE, 3, III, (D/E) |
| Transport document description (IMDG) | : UN 2265 N,N-DIMETHYLFORMAMIDE, 3, III (58°C c.c.) |
| Transport document description (IATA) | : UN 2265 N,N-DIMETHYLFORMAMIDE, 3, III |
| Transport document description (ADN) | : UN 2265 N,N-DIMETHYLFORMAMIDE, 3, III |
| Transport document description (RID) | : UN 2265 N,N-DIMETHYLFORMAMIDE, 3, III |

14.3. Transport hazard class(es)

ADR

Transport hazard class(es) (ADR) : 3
Danger labels (ADR) : 3

IMDG

Transport hazard class(es) (IMDG) : 3
Danger labels (IMDG) : 3

IATA

Transport hazard class(es) (IATA) : 3
Hazard labels (IATA) : 3

ADN

Transport hazard class(es) (ADN) : 3
Danger labels (ADN) : 3
RID
Transport hazard class(es) (RID) : 3
Danger labels (RID) : 3

14.4. Packing group
Packing group (ADR) : III
Packing group (IMDG) : III
Packing group (IATA) : III
Packing group (ADN) : III
Packing group (RID) : III

14.5. Environmental hazards
Dangerous for the environment : No
Marine pollutant : No
Other information : No supplementary information available

14.6. Special precautions for user
- Overland transport
Classification code (ADR) : F1
Limited quantities (ADR) : 5L
Excepted quantities (ADR) : E1
Packing instructions (ADR) : P001, IBC03, LP01, R001
Mixed packing provisions (ADR) : MP19
Portable tank and bulk container instructions (ADR) : T2
Portable tank and bulk container special provisions (ADR) : TP2
Tank code (ADR) : LGBF
Vehicle for tank carriage : FL
Transport category (ADR) : 3
Special provisions for carriage - Packages (ADR) : V12
Special provisions for carriage - Operation (ADR) : S2
Hazard identification number (Kemler No.) : 30
Orange plates : 30
Tunnel restriction code (ADR) : D/E
EAC code : •2Y

- Transport by sea
Limited quantities (IMDG) : 5 L
DIMETHYLFORMAMIDE AR/ACS
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Excepted quantities (IMDG) : E1
Packing instructions (IMDG) : P001, LP01
IBC packing instructions (IMDG) : IBC03
Tank instructions (IMDG) : T2
Tank special provisions (IMDG) : TP2
EmS-No. (Fire) : F-E
EmS-No. (Spillage) : S-D
Stowage category (IMDG) : A
Flash point (IMDG) : 58°C c.c.
MFAG-No : 129

- Air transport
PCA Excepted quantities (IATA) : E1
PCA Limited quantities (IATA) : Y344
PCA limited quantity max net quantity (IATA) : 10L
PCA packing instructions (IATA) : 355
PCA max net quantity (IATA) : 60L
CAO packing instructions (IATA) : 366
CAO max net quantity (IATA) : 220L
ERG code (IATA) : 3L

- Inland waterway transport
Classification code (ADN) : F1
Limited quantities (ADN) : 5 L
Excepted quantities (ADN) : E1
Carriage permitted (ADN) : T
Equipment required (ADN) : PP, EX, A
Ventilation (ADN) : VE01
Number of blue cones/lights (ADN) : 0

- Rail transport
Classification code (RID) : F1
Limited quantities (RID) : 5L
Excepted quantities (RID) : E1
Packing instructions (RID) : P001, IBC03, LP01, R001
Mixed packing provisions (RID) : MP19
Portable tank and bulk container instructions (RID) : T2
Portable tank and bulk container special provisions (RID) : TP2
Tank codes for RID tanks (RID) : LGBF
Transport category (RID) : 3
Special provisions for carriage – Packages (RID) : W12
Colis express (express parcels) (RID) : CE4
Hazard identification number (RID) : 30

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

15.1.1. EU-Regulations

No REACH Annex XVII restrictions
N,N-dimethylformamide is on the REACH Candidate List
DIMETHYLFORMAMIDE AR/ACS is not on the REACH Annex XIV List

15.1.2. National regulations

Germany
AwSV/VwVwS Annex reference Water hazard class (WGK) 2, hazardous to water (KBwS-Beschluss; WGK No 83)
12th Ordinance Implementing the Federal Immission Control Act - 12.BImSchV Is not subject of the 12. BImSchV (Hazardous Incident Ordinance)

Denmark
Recommendations Danish Regulation Young people below the age of 18 years are not allowed to use the product
Pregnant/breastfeeding women working with the product must not be in direct contact with the product
The requirements from the Danish Working Environment Authorities regarding work with carcinogens must be followed during use and disposal

15.2. Chemical safety assessment
No additional information available

SECTION 16: Other information

Full text of R-, H- and EUH-phrases:

| Acute Tox. 4 (Dermal) | Acute toxicity (dermal), Category 4 |
| Acute Tox. 4 (Inhalation) | Acute toxicity (inhal.), Category 4 |
| Eye Irrit. 2 | Serious eye damage/eye irritation, Category 2 |
| Flam. Liq. 3 | Flammable liquids, Category 3 |
| Repr. 1B | Reproductive toxicity, Category 1B |
| H226 | Flammable liquid and vapour |
| H312 | Harmful in contact with skin |
| H319 | Causes serious eye irritation |
| H332 | Harmful if inhaled |
| H360D | May damage the unborn child |
| R20/21 | Harmful by inhalation and in contact with skin |
| R36 | Irritating to eyes |
| R61 | May cause harm to the unborn child |
| Xi | Irritant |
| Xn | Harmful |
This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.