**MATERIAL SAFETY DATA SHEET**

**CHEMICAL NAME** : FORMIC ACID  
**C.A.S. No** : 64186  
**UN No** : 1779

### 1. CHEMICAL IDENTITY :  
- **Chemical Name** : FORMIC ACID  
- **Synonyms** : Formic acid, Formylic acid, Methanoic acid  
- **Trade Name** :

<table>
<thead>
<tr>
<th>Formula</th>
<th>C.A.S. No</th>
<th>UN No</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCOOH</td>
<td>64186</td>
<td>1779</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Regulated Identification</th>
<th>Shipping name</th>
<th>Hazchem code</th>
<th>Code/ Label</th>
<th>Hazardous Waste ID No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Formic Acid</td>
<td>2R</td>
<td>Corrosive Liquid</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hazardous Ingredients</th>
<th>C.A.S. No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formic Acid 99%</td>
<td>64186</td>
</tr>
</tbody>
</table>

### 2. PHYSICAL/CHEMICAL DATA  
- **Boiling Pt/Range** : 100.8 °C  
- **Physical state** :
- **Appearance** : Colourless  
- **Melting/Freezing pt** : 8.2 °C  
- **Vapour Pr. (mm Hg)** : 40 @35 °C  
- **Specific Gravity** : 1.22 @ 20 °C  
- **Vapour Density** : 1.59 (Water = 1)  
- **Odour** : Fuming liquid, pungent, penetrating @ 30 °C  
- **Solubility in water** : Miscible in water  

### 3. FIRE AND EXPLOSION HAZARD DATA  
- **Flammability** : Flammable  
- **LEL** : (90% sol.) 18%  
- **Flash point (OC)** : 69 °C  
- **UEL** : (90% sol.) 57 %  
- **Autoignition Temp.** : 600 °C  
- **Explosion sensitivity to impact** : Not known  
- **Explosion sensitivity to static electricity** : Not known  
- **Hazardous combustion product** : Carbon Monoxide  
- **Hazardous polymerisation** : Not known  
- **Combustible liquid** : YES  
- **Flammable material** : YES  
- **Explosive material** : NO  
- **Corrosive material** : YES  
- **Oxidiser** : NO  
- **Pyrophoric material** : NO  

### 4. REACTIVITY DATA.  
- **Chemical Stability** : Stable  
- **Incompatibility with other material** : Furfuryl alcohol, H₂O₂, P₂O₅, Nitromethane  
- **Reactivity** : Explodes when mixed with chemicals mentioned in Incompatibility column.  
- **Hazardous Reaction Product** : Not known
5. **HEALTH HAZARD DATA**

   **Routes of Entry**: Inhalation, Ingestion, Eyes and skin.

   **Effects of**: Irritating to eyes, skin mucous membrane.

   **Exposure/Symptoms**: Wash affected part of body with plenty of fresh water.

   **Emergency Treatment**: In case of inhalation, bring victim to fresh air, administer artificial respiration if necessary. Consult doctor.

   LD 50 (Oral-Rat): 1210 mg/kg

   TLV (ACGIH): 5 PPM

   Odour Threshold: ______________

6. **PREVENTIVE MEASURES**:

   **Personal Protective Equipment**: Do not breath vapours. Use rubber/PVC gloves, Shoes, apron, goggles.

   **Handling and Storage**: Store in cool, well ventilated place away from heat/fllame

   **Precautions**: ______________

7. **EMERGENCY / FIRST AID MEASURES**

   **FIRE**

   | Fire extinguishing: | CO₂, Dry Chemical powder |
   | Media: | Alcohol, foam |
   | Special Procedures: | - |

   **EXPOSURE**

   | First Aid Measures: | In case of inhalation, bring victim to fresh air. In case of spills on body or in eyes, wash with copious Fresh water for 15-20 minutes. Remove all contaminated clothings. Consult doctor. |

   | Antidotes/Dosages: | |

   **SPILLS**

   | Steps to be taken: | Profusely dilute and wash out spills. Observe “NO SMOKING”|

   | Waste Disposal Methods: | Dispose in vapour tight bags. |

8. **ADDITIONAL INFORMATION / REFERENCES**

   We are only occasionally using this material in very small quantity as laboratory reagent.

9. **MANUFACTURERS/SUPPLIERS DATA**

   **NAME OF FIRM**: Rashtriya Chemicals and Fertilisers Ltd.,
   Thal Unit - Alibag, Dist. Raigad, Maharashtra
   TEL No.02141 - 238001   FAX 238091
   IPD TEL 25523161 FAX 24045134

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# MATERIAL SAFETY DATA SHEET

## CHEMICAL NAME
**TRIMETHYL AMINE (ANHYDROUS)**

**C.A.S. No**: 75503  
**UN No**: 1083

## 1. CHEMICAL IDENTIFY:
- **Chemical Name**: Trimethyl Amine (Anhydrous)  
- **Synonyms**:  
- **Trade Name**: TMA  
- **Formula**: \((\text{CH}_3)_3\text{N}\)  
- **C.A.S. No**: 75503  
- **UN No**: 1083  
- **Regulated Identification**: Trimethyl Amine  
- **Hazchem code**: 2 PE  
- **Code/ Label**: Flammable Gas Class 2  
- **Hazardous Waste ID No**: 5  
- **Hazardous Ingredients**: 1.Trimethyl Amine 99.5% Other amines 0.3%

## 2. PHYSICAL/CHEMICAL DATA
- **Boiling Pt/Range**: 2.87 °C  
- **Physical state**: Gas, Liquid  
- **Appearance**: Colourless  
- **Melting/Freezing pt**: -117.1 °C  
- **Vapour Pr. (mm Hg)**: @ 35 °C  
- **Specific Gravity**: 0.662 @ 25 °C  
- **Vapour Density**: 2.00 (Water = 1)  
- **Solubility in water**: Soluble  
- **Odour**: Fishy to ammonical  
- **pH**: Alkaline

## 3. FIRE AND EXPLOSION HAZARD DATA
- **Flammability**: Highly flammable  
- **LEL**: 2.00 %  
- **UEL**: 11.60 %  
- **Flash point (OC) °C**: 190 °C  
- **Flash point (CC) °C**: -7  
- **Autoignition Temp.**: Not available  
- **Explosion sensitivity to impact**: Stable  
- **Explosion sensitivity to static electricity**: Not available  
- **Hazardous combustion product**: Toxic fumes of NOX  
- **Hazardous polymerisation**: Will not occur  
- **Combustible liquid**: YES  
- **Flammable material**: YES  
- **Explosive material**: NO  
- **Corrosive material**: NO  
- **Oxidiser**: NO  
- **Pyrophoric material**: NO

## 4. REACTIVITY DATA.
- **Chemical Stability**: Stable  
- **Incompatibility**: Ethylene Oxide  
- **Reactivity**: Can react vigorously with oxidising materials and acids  
- **Hazardous Reaction**: None particularly

## 5. HEALTH HAZARD DATA
- **Routes of Entry**: Inhalation, ingestion, eyes and skin. Irritation of eyes, respiration tract and lungs. burns, difficulty in breathing.  
- **Exposure/Symptoms**: Pulmonary edema. On chormic exposure causes conjunctivitis And bronchitis.  
- **Emergency Treatment**: Wash affected parts of body with plenty of fresh water. In case Of inhalation, bring victim to fresh air and administer artificial Respiration/oxygen therapy.
6. **PREVENTIVE MEASURES**

Personal Protective Equipment: Avoid contact with liquid or vapours. Provide rubber PVC hand gloves and apron/suit, goggles, rubber/PVC shoes and self-contained breathing apparatus.

Handling and Storage Precautions: Keep the chemical away from heat, flame and oxidising materials.

7. **EMERGENCY / FIRST AID MEASURES**

**FIRE**
- Fire extinguishing media: CO₂, Dry chemical powder, water.
- Special Procedures: If exposed to heat or fire, keep containers cool by spraying water. Flash back along vapour trail may occur.

**EXPOSURE**
- First Aid Measures: Remove victim to fresh air. If breathing is difficult or stopped, administer artificial respiration or oxygen therapy. In case of spills on body or eyes, remove contaminated clothes and wash with plenty of water for min. 15 minutes. Go to Doctor/Physician.

**SPILLS**
- Steps to be taken: Try to stop leak, if without risk. Dilute the leak with water. Contain leak using sand or earth. Floors should be washed with water. Seal waste in vapour tight bags or containers and then dispose.

8. ADDITIONAL INFORMATION / REFERENCES

i) Poison if ingested.

ii) A very dangerous fire hazard when exposed to heat or flame.

iii) Due to alkaline nature and very low temperature, severe eye injuries can occur if goes to eyes.

9. **MANUFACTURERS/SUPPLIERS DATA**

NAME OF FIRM: Rashtriya Chemicals and Fertilisers Ltd., Trombay Unit- Chembur, Mumbai 400074

TEL No. 25522245 FAX 25522231

TEL No.02141 - 238001 FAX 238091

IPD TEL 25523161 FAX 24045134

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MATERIAL SAFETY DATA SHEET

CHEMICAL NAME : MONOMETHYLAMINE (ANHYDROUS)
C.A.S. No : 74895
UN No : 1061

1. CHEMICAL IDENTIFY:

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Mono Methyl Amine (Anhydrous)</th>
</tr>
</thead>
</table>

Synonyms : Mono Methyl Amine (Anhydrous)

Trade Name: 

Formula : CH₃NH₂

C.A.S. No : 74895

UN No : 1061

Regulated Identification:

<table>
<thead>
<tr>
<th>Shipping name</th>
<th>Monomethyl Amine</th>
</tr>
</thead>
</table>

| Hazardous Waste ID No: | 5 |

Hazardous Ingredients:

<table>
<thead>
<tr>
<th>Code/ Label</th>
<th>Flammable gas class</th>
</tr>
</thead>
</table>

2. PHYSICAL/CHEMICAL DATA

<table>
<thead>
<tr>
<th>Boiling Pt/Range</th>
<th>6.3 °C</th>
</tr>
</thead>
</table>

Physical state : Gas, liquid

Appearance : Colourless

Melting/Freezing pt: -93.5 °C

Vapour Pr. (mm Hg) : @ 25°C Specific Gravity : 0.662

Vapour Density : 1.08 (Water = 1) Alkaline

Solubility in water : soluble

Odour : Fishy to ammonical

@ 30 °C

3. FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>Flammability</th>
<th>Highly flammable</th>
</tr>
</thead>
</table>

LEL : 4.95 %

UEL : 20.75 %

Flash point (OC) : -17.75°C

Autoignition Temp. : 430 °C

Explosion sensitivity to impact : Stable

Explosion sensitivity to static electricity : Not available

Hazardous combustion product : Toxic fumes of NOX

Hazardous polymerisation : will not occur

Combustible liquid : YES

Flammable material : YES

Explosive material : NO

Corrosive material : NO

Oxidiser : NO

Pyrophoric material : NO

Organic material : NO

4. REACTIVITY DATA.

Chemical Stability : Stable

Incompatibility : With nitromethane

Reactivity : Can react vigorously with oxidising materials and acids.

Hazardous Reaction : None particularly

5. HEALTH HAZARD DATA

Routes of Entry : Inhalation, Ingestion, Eyes and skin.
Effects of : Irritation of eyes respiratory tract and lungs, burns,

Exposure/Symptoms: difficulty in breathing, pulmonary edema. On chronic Exposure causes conjunctivitis and bronchitis.

Emergency Treatment : Wash affected parts of body with plenty of fresh water

In case of inhalation, bring victim to fresh air and administer Artificial respiration/oxygen therapy

LD 50 (Inh.mam): 2400 mg/m³

STEL : Not listed ppm

TLV (ACGIH) : 10 PPM

Odour Threshold : Not available
6. **PREVENTIVE MEASURES:**
   Personal Protective Equipment: Avoid contact with liquid or vapours provide rubber
   PVC hand gloves and apron/suit, goggles. Rubber/ PVC shoes and self contained breathing apparatus.
   Handling and Storage: Keep the chemical away from heat, flame and Oxidising materials.

7. **EMERGENCY / FIRST AID MEASURES**
   **FIRE**
   Fire extinguishing: CO2, Dry chemical powder, water.
   Special Procedures: If exposed to heat or fire, keep containers cool by spraying water.
   Unusual Hazards: Flash back along vapour trail may occur.

   **EXPOSURE**
   First Aid Measures: Remove victim to fresh air. If breathing is difficult or stooped, administer artificial respiration or Oxygen therapy. In case of spills on body/eyes, remove contaminated clothes and wash with plenty of fresh water for min.15 minutes. Go to doctor/Physician
   Antidotes/Dosages: Not available.

   **SPILLS**
   Steps to be taken: Try to stop leak if without risk. Dilute the leak with water. Contain leak using sand or earth. Floors should be washed with water. Seal waste in vapour tight bags or containers and then dispose.

8. **ADDITIONAL INFORMATION / REFERENCES**
   i) Poison if ingested.
   ii) A very dangerous fire hazard when exposed to heat or flame.
   iii) Due to alkaline nature and very low temperature, severe eye injuries can Occur.

9. **MANUFACTURERS/SUPPLIERS DATA**
   NAME OF FIRM Rashtriya Chemicals and Fertilisers Ltd., Trombay Unit- Chembur, Mumbai 400074
   Thal Unit - Alibag, Dist. Raigad. Maharashtra
   TEL No. 25522245 FAX 25522231
   TEL No.02141 -238001 FAX 238091
   IPD TEL 25523161 FAX 24045134

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MATERIAL SAFETY DATA SHEET

CHEMICAL NAME : TRIMETHYL AMINE (AQUEOUS 30%)
C.A.S. No : 75-50-3
UN No : 11297

1. CHEMICAL IDENTITY:
- Chemical Name: TRIMETHYL AMINE (AQUEOUS 30%)
- Synonyms: FLAMMABLE LIQUID (3.2)
- Trade Name: TRIMETHYL AMINE
- Formula: (CH3)3N
- C.A.S. No: 75-50-3
- UN No: 11297

Regulated Identification:
- Shipping name: TRIMETHYL AMINE (AQUEOUS SOLUTION)
- Hazchem code: 2PE
- Code/Label: Flammable liquid (3.2)
- Hazardous Waste ID No: 5

Hazardous Ingredients: NIL

2. PHYSICAL/CHEMICAL DATA
- Boiling Pt: 300°C
- Physical state: Clear liquid
- Appearance: Colourless solution
- Melting/Freezing pt: -30°C
- Vapour Pr. (mm Hg): 465mm/Hg @ 35°C
- Vapour Density: 2.0(Gas)
- Specific Gravity: 0.90 @ 25°C
- pH: Alkaline(11.9)
- Solubility in water: Complete soluble
- Odour: Fishy

3. FIRE AND EXPLOSION HAZARD DATA
- Flammability: YES
- LEL: 2.00%
- Flash point: (OC) <°C
- UEL: 11.6%
- Flash point (CC) <°C
- Autoignition Temp.: 190°C (Gas)
- Explosion sensitivity to impact: NIL
- Explosion sensitivity to static electricity: Not available
- Hazardous combustion product: CO, CO2 & Oxides of nitrogen
- Hazardous polymerisation: Does not occur

4. REACTIVITY DATA
- Chemical Stability: Stable
- Incompatibility: Mercury, ethylene Oxide, strong oxidising agent, acids.
- Reactivity with other material: Normally stable
- Hazardous Reaction: None reported
- Product:
5. HEALTH HAZARD DATA

Routes of Entry: Inhalation, ingestion, skin, eye contact.

Effects of Exposure/Symptoms: Nose, throat, lungs irritation. Very high concentration can cause pulmonary edema which may be fatal. Eye irritation: blurred vision. Corrosive to skin. Causes serious burn. On ingestion burning of digestive tract.

Emergency Treatment: In case of contact, immediately flush eyes or skin with plenty of water (at least for 15 mins.). Remove contaminated clothing and shoes. If vapours are inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult give oxygen. If swallowed do not induce vomiting. Give large quantity of water. Call physician.

LD 50 (Oral-Rat): (IV-Mouse) 90mg/kg  STEL: 15 ppm 36 mg/m³
TLV (ACGIH): 10 PPM 24mg/m³  Odour Threshold: 8.00021 ppm

<table>
<thead>
<tr>
<th>Health Signals</th>
<th>Flammability</th>
<th>Reactivity</th>
<th>Special Signals</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

6. PREVENTIVE MEASURES:

Personal Protective Equipment: Eye face protection (Chemical splash goggle, full length Face shield), chemical suit (PVC suit with hood), respiration full face mask with chemical cartridges for methyl Amines during concentration above TLV. During uncontrolled release, use SCBA.

Handling and Storage: Store in a well ventilated area away from heat, flame & sparks. Keep container tightly closed. Do not store with oxidising materials. Water scrubber and

7. EMERGENCY / FIRST AID MEASURES

FIRE | Fire extinguishing: Water spray, foam, dry chemical powder, CO₂ Media.  
Special Procedures: Keep container cool by water spray. Dilute solution with water spray.

EXPOSURE | First Aid Measures: In case of contact, immediately flush eyes or skin with plenty of water (at least for 15 mins.) remove contaminated clothing and shoes. If vapours are inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, do not induce vomiting. Give large quantity of water. Call physician. Wear proper protective equipment before rescue operation.

| Antidotes/Dosages: |  
| SPILLS | Steps to be taken: Evacuate area to upwind direction. Extinguish/remove all ignition sources.
| Waste Disposal Methods: Prevent from entering public sewer or water ways or confine spaces. Contain spill with earth. Flush area with water. Small spill can be neutralised with 5% H₂SO₄.

8. ADDITIONAL INFORMATION / REFERENCES

Nothing special in addition to above given.
9 MANUFACTURERS/SUPPLIERS DATA
NAME OF FIRM Rashtriya Chemicals and Fertilisers Ltd., Trombay Unit- Chembur, Mumbai 400074 Thal Unit - Alibag, Dist. Raigad, Maharashtra
TEL No. 25522245 FAX 25522231
TEL No. 02141 - 238001 FAX 238091
IPD TEL 25523161 FAX 24045134

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MATERIAL SAFETY DATA SHEET

CHEMICAL NAME : **MONOMETHYL AMINE (AQUEOUS 40%)**
C.A.S. No : 74-89-5
UN No : 1235

1. CHEMICAL IDENTITY :
   Chemical Name : MONOMETHYL AMINE (AQUEOUS 40%)
   Synonyms : MMA
   Trade Name : MONOMEHTYL AMINE (AQUEOUS)
   Formula : CH3NH2
   C.A.S. No : 74-89-5
   UN No : 1235
   Regulated Identification
   Shipping name : METHYL AMINE (AQUEOUS SOLUTION)
   Hazchem code : 2PE
   Code/ Label : Flammable liquid (3.1)
   Hazardous Waste ID No: 5
   Hazardous Ingredients : NIL
   C.A.S. No :

2. PHYSICAL/CHEMICAL DATA
   Boiling Pt : 48° C
   Physical state : Clear Liquid
   Appearance : Colourless
   Melting/Freezing pt : -38° C
   Vapour Pr. (mm Hg) : @ 35° C 300mm Hg
   Specific Gravity : 0.90 @ 25° C
   Vapour Density : L.I(GAS)
   (Air = 1) pH : Alkaline
   Solubility in water : Comple.Soluble
   Odour : Fishy
   @ 30° C

3. FIRE AND EXPLOSION HAZARD DATA
   Flammability : YES
   LEL : 4.9 %
   Flash point (OC) : °C
   UEL : 20.7 %
   Flash point (CC) : °C
   TDG Flammability:
   Autoignition Temp. : 430° C(GAS)
   Explosion sensitivity to impact : NO
   Explosion sensitivity to static electricity : YES
   Hazardous combustion product : not reported
   Hazardous polymerisation : No Polymerisation
   Combustible liquid : YES
   Flammable material : YES
   Explosive material : YES
   Oxidiser : NO
   Pyrophoric material : NO
   Organic Peroxide : NO

4. REACTIVITY DATA.
   Chemical Stability : Stable
   Incompatibility : May reacts explosively with mercury
   with other material
   Reactivity : NO
   Hazardous Reaction : N/A
   Product.

5. HEALTH HAZARD DATA
   Routes of Entry : Inhalation, Ingestion, Skin, Eye contact.
   Effects of : Respiratory irritation & reversible haematological blood chemistry abnormalities. Irritation to mucous membrane
   Exposure/Symptoms: In case of contact immediately flush eyes or skin with plenty of Water (Atleast for 15 min.) Remove contaminated clothing& shoes
   Emergency Treatment : If vapours are inhaled, remove to fresh air. If not breathing give Artificial respiration. If breathing is difficult, give oxygen. If
   Swallowed, do not induce vomiting. Give large quantity of water. Call physician.
   LD 50 (Oral-Rat) : 100-200(Gas) mg/kg for 100% Amine
   STEL : (ACGIH)15ppm
   Permissible Exposure limit ppm
   TLV (ACGIH) : 10 PPM
   13mg/m³ Odour Threshold : <1 ppm mg/m³
   19mg/m³
6. **PREVENTIVE MEASURES**:

**Personal Protective Equipment**: Eye face protection (Chemical splash goggle, full length face shield), chemical suit (PVC suit with hood), Respiriratio full face mask with chemical cartridges for methyl amines during concentration above TLV uncontrolled Release/unknown conc. use

**Handling and Storage Precautions**: Store in well ventilated area away from heat, flame and sparks. Keep container tightly closed. Do not store with oxidising materials. Water scrubber and water sprinkler Deluge system for storage.

7. **EMERGENCY / FIRST AID MEASURES**

**FIRE**

| Fire extinguishing Media: Water spray, foam, dry chemical powder, CO₂ Media. |
| Special Procedures: Cool container with water spray. Dilute solution thoroughly with water spray if exposed to heat or Unusual Hazards: flame. Flash back if vapour reach source of ignition |

**EXPOSURE**

| First Aid Measures: In case of contact immediately flush eyes or skin with Plenty of water (atleast for 15 Min.) remove contaminated clothing and shoes. If vapours are inhaled, Remove to fresh air. If not breathing, give artificial Respiration. If breathing is difficult, give oxygen. If swallowed, do not induce vomiting. Give large Quantity of water. Call physician. Wear proper Protective equipments during rescue operation |

| Antidotes/Dosages: Corticosteroid spray (CSIR) |

**SPILLS**

| Steps to be taken: Review fire and explosion hazard and safety Precautions before proceeding with clean-up. Use Appropriate PPE. Evacuate area to upwind direction. Extinguish/remove all ignition sources. |

| Waste Disposal Methods: Do not flush to public sewer. Very dilute solution is biodegradable by acclimated bacteria. |

8. **ADDITIONAL INFORMATION / REFERENCES**

Nothing special in addition to above given.

9. **MANUFACTURERS/SUPPLIERS DATA**

**NAME OF FIRM**

Rashtriya Chemicals and Fertilisers Ltd.,
Trombay Unit- Chembur, Mumbai 400074
Thal Unit - Alibag, Dist. Raigad. Maharashtra

**TEL No.** 25522245  **FAX** 25522231
**TEL No.** 02141 - 238001  **FAX** 238091
**IPD** TEL 25523161  **FAX** 24045134

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CHEMICAL NAME :  DIMETHYLAMINE (ANHYDROUS)  
C.A.S. No : 124-40-3  
UN No : 1032  

1. CHEMICAL IDENTITY :  
   Chemical Name : Dimethylamine (Anhydrous)  
   Synonyms : Dimethyl Amine Anhydrous, N-Methylmethan amine  
   Trade Name :  
   Formula : C₂H₇N  
   C.A.S. No : 124-40-3  
   UN No : 1032  
   Shiping name : Dimethyl Amine  
   Hazchem code : 27  
   Code/ Label : Flammable Gas, Class 2  
   Hazardous Waste ID No : 5  
   Hazardous Ingredients : Dimethyl Amine  
   C.A.S. No : 124-40-3  

2. PHYSICAL/CHEMICAL DATA  
   Boiling Pt : 6.90 °C  
   Physical state :Liquified Compr.Gas  
   Appearance : Colourless  
   Melting/Freezing pt : -92.2 °C  
   Vapour Pr. (mm Hg) : @ 35 °C  
   Vapour Density : Not available (Water = 1)  
   Specific Gravity : 0.671 (Air = 1)  
   pH : Alkaline  
   Solubility in water : Soluble  
   Odour : Dead fish or Ammonical  
   Odour : Soluble in Alcohol  

3. FIRE AND EXPLOSION HAZARD DATA  
   Flammability : YES  
   LEL : 2.8 %  
   Flash point : C Not available(OC)  
   UEL : 14.4 %  
   Flash point : °C –6.65 (CC)  
   TDG Flammability : 2  
   Autoignition Temp. : 400 °C  
   Explosion sensitivity to impact : Stable  
   Explosion sensitivity to static electricity : Not available  
   Hazardous combustion product :  
   Emit toxic fumes of No₅  
   Hazardous polymerisation : Will not occur  
   Combustible liquid : YES  
   Flammable material : YES  
   Explosive material : NO  
   Corrosive material : NO  
   Oxidiser : NO  
   Pyrophoric material : NO  
   Organic Peroxide : NO  

4. REACTIVITY DATA.  
   Chemical Stability : Stable  
   Incompatibility : Strong Oxidisers, Chlorine, Mercury,fluorine,maleic anhydride and acrylaldehyde  
   with other material  
   Reactivity : Can react vigorously with Oxidising Materials.  
   Hazardous Reaction : None in particular  
   Product.  

5. HEALTH HAZARD DATA  
   Routes of Entry : Inhalation, Ingestion Eyes and Skin  
   Effects of :  
   Inhalation at high concentration(>100ppm)causes  
   nose and throat irritation,progress all the way to  
   Pulmonary edema. Eyes & Skin: Causes irritation.  
   Exposure/Symptoms :  
   Emergency Treatment :  
   Inhalation: Remove the victim to fresh air area. If  
   Breathing has stopped, administer artificial respiration or  
   Oxygen if necessary. Keep the victim warm and quiet. Do not  
  
Give stimulants. Eyes: flush thoroughly with plenty of water for 15 mins. Skin: Remove the contaminated clothing immediately and flush the affected area with large amounts of water. Seek medical aid.

LD 50 (Oral-Rat): Not listed mg/kg STEL: Not listed ppm; Not listed mg/m³
Permissible Exposure Limit Not listed ppm Not listed mg/m³
TLV (ACGIH): 10 PPM 18 mg/m³ Odour Threshold: 0.047 ppm 0.085 mg/m³

6. PREVENTIVE MEASURES:
Personal Protective Equipment: Avoid contact with liquid or vapours. Provide moulded rubber acid resistance hand gloves, Apron, shoes, face shield, self-contained breathing apparatus.
Handling and Storage Precautions: Keep the chemical away from heat, flame and oxidising materials.

7. EMERGENCY / FIRST AID MEASURES
FIRE
| Special Procedures: Keep the containers cool by spraying water if exposed to heat or flame.
| ! Unusual Hazards: Flashback along vapour trail may occur.

EXPOSURE | First Aid Measures: Inhalation: Remove the victim to fresh air. If breathing has stopped provide oxygen and keep the victim warm and quiet. Do not give stimulants. Eyes: Flush with plenty of water for 15 mins. Skin: Remove the contaminated clothes and wash the affected area with plenty of water. Seek Medical Aid.
| Antidotes/Dosages: Not available.

SPILLS | Steps to be taken: Shut off leaks if without risk. Contain leaking liquid on sand or earth. Wash the surface with water and soap.
| Waste Disposal Methods: Seal all the waste in vapour tight plastic bags for eventual disposal.

8. ADDITIONAL INFORMATION / REFERENCES
A poison by ingestion. A very dangerous fire hazard when exposed to heat or flame.

9. MANUFACTURERS/SUPPLIERS DATA
NAME OF FIRM: Rashtriya Chemicals and Fertilisers Ltd., Trombay Unit- Chembur, Mumbai 400074 Thal Unit - Alibag, Dist. Raigad. Maharashtra
TEL No. 25522245 FAX 25522231
TEL No. 02141-238001 FAX 238091
IPD TEL 25523161 FAX 24045134

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1. CHEMICAL IDENTITY:

   Chemical Name: DIMETHYL AMINE (AQUEOUS 40%)
   Synonyms: DMA
   Trade Name: DIMETHYL AMINE (AQUEOUS)

2. PHYSICAL/CHEMICAL DATA:

   Boiling Pt: 54 °C
   Physical state: Clear liquid
   Appearance: Colourless
   Melting/Freezing pt: -37 °C
   Vapour Pr. (mm Hg): @ 35 °C 215mmHg
   Vapour Density: 1.6(GAS) (Water = 1)
   Specific Gravity: 0.88
   pH: Alkaline (@11.9)
   Solubility in water: Complete soluble @ 30 °C

3. FIRE AND EXPLOSION HAZARD DATA:

   Flammability: YES
   LEL: 2.8 %
   Flash point (CC): -18 °C
   UEL: 14.4 %
   Flash point (OC): 0 °C
   Autoignition Temp.: 402 °C (GAS)
   Explosion sensitivity to impact: NIL
   Explosion sensitivity to static electricity: YES
   Hazardous combustion product: CARBON MONOXIDE & OXIDES OF NITROGEN
   Hazardous polymerisation: NO
   Combustible liquid: YES
   Flammable material: YES
   Explosive material: YES
   Corrosive material: YES
   Oxidiser: NO
   Pyrophoric material: NO
   Organic Peroxide: NO

4. REACTIVITY DATA:

   Chemical Stability: STABLE
   Incompatibility: With mercury (Reacts explosively), Acids, Acid Chlorides
   with other material: Acidic unhydride, Strong oxidising agents like fluorine chlorine
   Reactivity: May attack some form of rubber, plastics & coatings.
   Hazardous Reaction: Hazardous decomposition product - AMMONIA

5. HEALTH HAZARD DATA:

   Routes of Entry: Inhalation, ingestion, skin, eye contact.
   Effects of: Nose, throat, lung irritation. Very high concentration can cause pulmonary edema, which may be fatal.
   Exposure/Symptoms: In case of contact, immediately flush eyes or skin with plenty of water (at least FOR 15MINS.) remove contaminated clothing & shoes. If vapours are inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen. If swallowed, do not induce vomiting. Give large quantity of water. Call physician.

LD 50 (Oral-Rat): 690 mg/kg body weight
STEL: 15ppm 28mg/m³
Permissible exposure limit: 10 ppm  18 mg/m³  Odour Threshold: 0.021 - 0.0

TLV (ACGIH): 10PPM  18mg/m³

Odour Threshold: 0.021 - 0.0

6. **PREVENTIVE MEASURES**:

   Personal Protective Equipment: Eye face protection (Chemical splash goggle, full length face shield), chemicals suit (PVC suit with hood), respiration full face mask with chemical cartridges for methyl amines, during concentration above TLV. During uncontrolled release use SCBA.

   Handling and Storage Precautions:
   - Store in a well ventilated area away from Heat, Flame & Sparks. Keep container tightly closed. Do not store with Oxidising materials. Water sprinklers, water scrubber or Deluge system for storage.

7. **EMERGENCY / FIRST AID MEASURES**

   **FIRE**
   - Fire extinguishing Media: Water, Foam, Dry chemical powder, CO₂.
   - Special Procedures: Cool tank/container with water spray. Dilute solution thoroughly with water spray.

   **EXPOSURE**
   - First Aid Measures: In case of contact, immediately flush eyes or skin with plenty of water (at least for 15 min.). Remove contaminated clothing and shoes. If vapours are inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, do not induce vomiting. Give large quantity of water. Call physician. Wear proper protection before rescue operation.

   **SPILLS**
   - Steps to be taken: Review fire & explosion hazard & safety precautions. Before proceeding with clean-up. Use appropriate PPE. Evacuate area to upwind direction. Extinguish/remove all ignition sources.

   **Antidotes/Dosages**: Carticosteroid spray (CSIR)

8. **ADDITIONAL INFORMATION / REFERENCES**

   Nothing special in addition to above given.

9. **MANUFACTURERS/SUPPLIERS DATA**

   NAME OF FIRM: Rashtriya Chemicals and Fertilisers Ltd., Trombay Unit- Chembur, Mumbai 400074
   - Thal Unit - Alibag, Dist. Raigad. Maharashtra

   TEL No. 25522245  FAX 25522231
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MATERIAL SAFETY DATA SHEET

CHEMICAL NAME : SULPHURIC ACID
C.A.S. No : 7664-93-9
UN No : 1830

1. CHEMICAL IDENTITY : SULPHURIC ACID
Synonyms : Oil of Vitreol, Battery Acid, Chamber Acid, Spent Sulphuric Acid.
Trade Name:
Formula : \( H_2SO_4 \)
C.A.S. No : 7664-93-9
UN No 1830
Regulated Identification:
| Hazchem code | 2 P |
| Code/ Label | Corrosive, Class & |
| Hazardous Waste ID No | 16 |
Hazardous Ingredients : Sulphuric Acid
C.A.S. No : 7664-93-9

2. PHYSICAL/CHEMICAL DATA
Boiling Pt : 290\(^\circ\) C
Appearance : Colourless, oily
Melting/Freezing pt : 10.49 \(^\circ\) C
Vapour Pr. (mm Hg) : @ 35\(^\circ\) C
Vapour Density : Not available
Specific Gravity : 1.84 at (Water = 1)
Physical state : Liquid
pH : <1
Solubility in water : Miscible

3. FIRE AND EXPLOSION HAZARD DATA
Flammability : NO
Flash point : Flash point \(^\circ\) C Not pertinent (OC).
UEL : Not pertinent %
Flash point : Flash point \(^\circ\) C Not pertinent (CC)
Autoignition Temp. \(^\circ\) C : Not pertinent
Explosion sensitivity to impact : Stable
Explosion sensitivity to static electricity : Stable
Hazardous combustion product : Emits toxic fumes of So\(_x\)
Hazardous polymerisation : Will not occur
Combustible liquid : NO
Flammable material : NO
Explosive material : NO
Corrosive material : YES
Oxidiser : YES
Pyrophoric material : NO
Organic Peroxide : NO
Others

4. REACTIVITY DATA.
Chemical Stability : Stable
Incompatibility : Organic Chlorates, Carbides, Fulminates, Picrates, metals.
with other material
Reactivity : Powerful Acidic oxidiser, ignites or explodes on contact with many materials like Acetic Acid, Acetone Cyanohydrin, (Acetone+HNO\(_3\)), (Acetone+K\(_2\)Cr\(_2\)O\(_7\)), Acetonitrile, Acrolein, Acrylonitrile.
Hazardous Reaction : Reacts with many metals to form flammable Hydrogen Gas
Product : Which forms explosive mixtures with air. Reacts with water to Produce heat and toxic and corrosive fumes.
5. **HEALTH HAZARD DATA**

Routes of Entry: Inhalation, Ingestion, Eyes and Skin.

Effects of Exposure/Symptoms: Inhalation of vapour from hot conc. acid may injure lungs. Contact with skin or eyes causes severe burns. Very dilute Soln. Causes dermatitis. Exposure causes bronchitis.

Emergency Treatment: Seek Medical Aid immediately for all types of exposures. Observe victim for delayed pulmonary reaction. Move him to fresh Air. Give artificial respiration. Skin: Remove clothes and shoes. Do Not use oil or ointment. Flush affected area with plenty of water. Eyes: Wash with plenty of water for 15 mins. Ingestion: Give Plenty of water to drink, do not induce vomiting.

<table>
<thead>
<tr>
<th>LD 50 (Oral-Rat):</th>
<th>mg/kg</th>
<th>STEL</th>
<th>PPM</th>
<th>Odour Threshold</th>
</tr>
</thead>
</table>

6. **PREVENTIVE MEASURES:**

Personal Protective Equipment: Avoid contact with liquid. Do not eat or drink at work Place.

Handling and Storage Precautions: Store in a cool, well ventilated area, away from Oxidisers. Acids of 98% stored in M.S. or C.I.tanks/drums.

7. **EMERGENCY / FIRST AID MEASURES**

**FIRE**

| Fire extinguishing Media: | Dry chemical or Carbon Dioxide. Do not use water. |
| Special Procedures: | Keep the containers cool by spraying water if exposed to heat or flame. |
| Unusual Hazards | Poisonous gas may be produced. |

**EXPOSURE**

| First Aid Measures: | If inhaled, remove the victim to fresh air area, provide Artificial respiration or oxygen if required. If eyes are affected wash with plenty of water for 15 mins. Or more. If skin is affected remove contaminated Clothes and shoes and wash the affected area with Plenty of water and soap. Seek Medical Aid immediately for all types of exposures. |
| Antidotes/Dosages: | Not available. |

**SPILLS**

| Steps to be taken: | Shut off leaks if without risk. Contain leaking liquid on Sand or earth. Do not absorb on sawdust or other Combustibles. |
| Waste Disposal Methods: |

8. **ADDITIONAL INFORMATION / REFERENCES**

A common air contaminant. Sensitivities to Sulphuric Acid mists or vapours varies with Individuals. Normally 0.125-0.5 ppm may be mildly annoying, 1.5-2.5 ppm may definitely be unpleasant, 10-20 ppm unbearable. Contact with water creates violent reaction generating much heat and splattering of hot acid. Attacks many metals, liberating Hydrogen which is inflammable and forms explosive mixture with air.

9. **MANUFACTURERS/SUPPLIERS DATA**

NAME OF FIRM: Rashtriya Chemicals and Fertilisers Ltd., Trombay Unit- Chembur, Mumbai 400074

TEL No. 25522245  FAX 25522231

IPD TEL 25523161  FAX 24045134

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CHEMICAL NAME : NITRIC ACID
C.A.S. No : 7697-37-2
UN No : 2031

1. CHEMICAL IDENTITY : NITRIC ACID
Chemical Classification: Inorganic Acid
Synonyms : Aquaforties, Hydrogen Nitrate, Azotic Acid
Trade Name :
Formula : HNO₃ C.A.S. No 7697-37-2 UN No 2031
Regulated Identification | Shipping name : Nitric Acid
| Hazchem code : 2 P E
| Code/ Label : Corrosive, Oxidiser, Class 8
| Hazardous Waste ID No: 16
Hazardous Ingredients : Nitric Acid
C.A.S. No : 7697-37-2

2. PHYSICAL/CHEMICAL DATA
Boiling Pt : 86 °C
Physical state : Watery liquid
Appearance : Colourless to Brown
Melting/Freezing pt : -42 °C
Vapour Pr. (mm Hg) : @ 35 °C Not available
Specific Gravity : 1.49 @ 20 °C
Vapour Density : Not available (Water = 1)
(Air = 1) pH Acidic Solubility in water : Soluble
Odour: Choking Odour
@ 30 °C

3. FIRE AND EXPLOSION HAZARD DATA
Flammability : NO LEL : Not pertinent %
Flash point : °C Not pertinent(OC)UEL : Not pertinent : %
Flash point : °C Not pertinent(CC)TDG Flammability : 8
Autoignition Temp. : Not pertinent °C
Explosion sensitivity to impact : Stable
Explosion sensitivity to static electricity : Stable
Hazardous combustion product : May emit poisonous Oxides of Nitrogen And Acid fumes.
Hazardous polymerisation :
Combustible liquid : NO Flammable material : NO
Explosive material : NO Corrosive material : YES
Oxidiser : YES Pyrophoric material : NO
Organic Peroxide : NO

4. REACTIVITY DATA.
Chemical Stability : Stable
Incompatibility with other material
Reactivity : Can react explosively with many reducing agents. Reacts With water and steam to produce heat and toxic, corrosive and Flammable vapours. Explosive reaction with Acetic Anhydride, Acetone+Acetic acid (in storage)
Hazardous Reaction Product : Reacts with water and steam to produce toxic, corrosive and Flammable vapours.
5. HEALTH HAZARD DATA
Routes of Entry: Inhalation, Ingestion, Skin and Eyes.
Effects of Exposure/Symptoms: Vapours irritate eyes and respiratory tract, lung injury may not become apparent for several hours following exposure. Liquid May cause severe burns of eyes and skin.
Emergency Treatment: Inhalation: Remove the victim to fresh air area. Provide Artificial respiration if required. Ingestion: Give large volumes Of water. Do not induce vomiting. Skin & Eyes: Flush the affected Area with plenty of water for long time. Seek Medical Aid immediately.

---

LD 50 (Oral-Rat): Not listed mg/kg
STEL: 4 ppm 10 mg/m³
Permissible Exposure Limit 2 ppm 5 mg/m³
TLV (ACGIH): 2PPM 5mg/m³ AvailableOdour Threshold: Not ppm Not mg/m³
NFPA Hazard: Health 3 Flammability 0 Reactivity 0 Special Signals

---

6. PREVENTIVE MEASURES:
Personal Avoid contact with liquid or vapours
Protective Equipment: Provide air mask, rubber acid suit, hood, boots, gloves, face shield. Water shower, eye wash basin should be provided near to the work Place.
Handling and Storage: Store in a well ventilated, cool, dry area, away from oxidizing agents Precautions.

---

7. EMERGENCY / FIRST AID MEASURES
FIRE
| Fire extinguishing: Not flammable Media. |
| Special Procedures: Keep the containers cool by spraying water if exposed to heat or flame. |
| Unusual Hazards: Poisonous gases are produced. |

EXPOSURE
| First Aid Measures: If eyes and skin are affected wash with plenty of water. If inhaled, remove the victim to fresh air area. If Ingested, do not induce vomiting. Seek Medical Aid Immediately for any type of exposure to this chemical |
| Antidotes/Dosages: Not available |

SPILLS
| Steps to be taken: Dilute with water and neutralise with alkali and drench |
| Waste Disposal Methods: Seal all the waste in vapour tight plastic bags for eventual disposal. |

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8. ADDITIONAL INFORMATION / REFERENCES
A powerful oxidiser and corrosive material. Flammable by chemical reaction with reducing Agents.

---

9. MANUFACTURERS/SUPPLIERS DATA
NAME OF FIRM: Rashtriya Chemicals and Fertilisers Ltd., Trombay Unit- Chembur, Mumbai 400074
TEL No. 25522245 FAX 25522231
IPD TEL 25523161 FAX 24045134
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MATERIAL SAFETY DATA SHEET

CHEMICAL NAME : DIMETHYL FORMAMIDE
C.A.S. No. : 5954507
UN No. : 2265

1. CHEMICAL IDENTITY :
Chemical Name: DIMETHYL FORMAMIDE
Synonyms: N-FORMYLDIMETHYLAMINE
Trade Name : DIMETHYL FORMAMIDE
Formula : C₃H₇NO  C.A.S. No 5954507  UN No 2265
Regulated Identification :
| Shipping name | DIMETHYL FORMAMIDE |
| Hazchem code | 2PE |
| Code/ Label | Flammable liquid  Class - 3 |
| Hazardous Waste ID No. | 5 |
Hazardous Ingredients : 1. DIMETHYL FORMAMIDE
C.A.S. No : 5954507

2. PHYSICAL/ CHEMICAL DATA
Boiling Pt : 152.8 °C  Physical state : Liquid
Appearance : Colourless  Melting/Freezing pt : -61° C
Vapour Pr. (mm Hg) : 3.7 mm @ 25 °C  Specific Gravity : 0.9445 @ 25° C
Vapour Density : 2.51 (Water = 1)
(Air = 1)  pH : Slightly Acidic.
Solubility in water Soluble @30°C

3. FIRE AND EXPLOSION HAZARD DATA
Flammability : Yes  LEL : 2.2 %
Flash point : Not available. UEL : 15.2 %
Autoignition Temp. : 833 °C
Explosion sensitivity to impact : Stable.
Explosion sensitivity to static electricity : Not available.
Hazardous combustion product : Not known.
Hazardous polymerisation : Will not occur.

Combustible liquid : Yes  Flammable material : Yes
Explosive material : No  Corrosive material : No
Oxidiser : No  Pyrophoric material : No
Inorganic material : No  3

4. REACTIVITY DATA.
Chemical Stability : Stable
Incompatibility : Strong oxidisers, Halogenated hydrocarbons, CCl₄,C₆Cl₆, with other material Organic nitrates, P₂O₃, Cr₂O₃, Al(C₂H₅)₃
Reactivity : Can react vigorously with oxidising materials and hydrocarbons.
Hazardous Reaction Product : Not available.
5. **HEALTH HAZARD DATA**

Routes of Entry: Inhalation, Ingestion, eye and skin.

Effects of Exposure/Symptoms: Inhalation at high concentration causes nose and throat irritation. Eye and skin irritation on exposure.

Emergency Treatment: Remove the victim to the fresh air area, if breathing has stopped, administer artificial respiration and oxygen if necessary. Keep the victim warm and quiet. Do not give stimulants. Eyes: Flush thoroughly with plenty of water for 15 mins. Skin: Remove the contaminated clothing immediately and flush the affected area with large amount of water. Seek medical aid.

LD 50 (Oral-Rat): 2800 mg/kg  
STEL: Not listed

TLV (ACGIH): 10 PPM  
Odour Threshold: Not listed

6. **PREVENTIVE MEASURES**: Avoid contact with liquid and vapours.

Personal Protective Equipment: Provide moulded rubber acid resistant hand gloves, apron, shoes, face shield.

Handling and Storage: Keep the chemicals away from heat, flame, oxidising material.

7. **EMERGENCY / FIRST AID MEASURES**

FIRE  
| Fire extinguishing | CO2, Dry Chemical Powder, Foam Media. |
| Special Procedures | Keep the container cool by spraying water. If exposed to heat or flame. |

EXPOSURE  
| First Aid Measures | Remove the victim to the fresh air area, if breathing has stopped, administer artificial respiration and oxygen if necessary. Keep the victim warm and quiet. Do not give stimulants. Eyes: Flush thoroughly with plenty of water for 15 mins. Skin: Remove the contaminated clothing immediately and flush the affected area with large amount of water. Seek medical aid. |
| Antidotes/Dosages | Not available. |

SPILLS  
| Steps to be taken | Shut off leaks if without risk. Contain the liquid on sand or earth. |
| Waste Disposal Methods | Seal all waste in vapour tight plastic bags for eventual disposal. |

8. **ADDITIONAL INFORMATION / REFERENCES**

Nothing special in addition to above given.

9. **MANUFACTURERS/SUPPLIERS DATA**

**NAME OF FIRM**  
Rashtriya Chemicals and Fertilisers Ltd., Thal Unit - Alibag, Dist. Raigad, Maharashtra  
TEL No.02141 - 238001  FAX 238091

**IPD TEL 25523161 FAX 24045134**

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# MATERIAL SAFETY DATA SHEET

**CHEMICAL NAME**: DIMETHYL ACETAMIDE

<table>
<thead>
<tr>
<th>C.A.S. No</th>
<th>127195</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN No</td>
<td>--</td>
</tr>
</tbody>
</table>

## 1. CHEMICAL IDENTITY:

- **Chemical Name**: DIMETHYL ACETAMIDE
- **Synonyms**: DIMETHYLAMIDE ACETATE, DIMETHYL ACETONEAMIDE
- **Trade Name**: DIMETHYL ACETAMIDE
- **Formula**: C₄H₉NO
- **Regulated Identiﬁcation**:
  - **Shipping name**: DIMETHYL ACETAMIDE
  - **Hazchem code**: 2PE
  - **Code/Label**: Flammable liquid
  - **Class**: 3
  - **Hazardous Waste ID No**: 5
- **Hazardous Ingredients**: 1. DIMETHYL ACETAMIDE

<table>
<thead>
<tr>
<th>C.A.S. No</th>
<th>127195</th>
</tr>
</thead>
</table>

## 2. PHYSICAL/CHEMICAL DATA

- **Boiling Pt**: 165 °C
- **Physical state**: Liquid
- **Appearance**: Colourless
- **Melting/Freezing pt**: -20 °C
- **Vapour Pr. (mm Hg)**: 1.3 mm @ 25 °C
- **Vapour Density**: 3.01 @ 25 °C (Water = 1)
- **pH**: Slightly Acidic.
- **Specific Gravity**: 0.945 @ 25 °C
- **Solubility in water**: Soluble
- **Solubility at 30 °C**: Soluble

## 3. FIRE AND EXPLOSION HAZARD DATA

- **Flammability**: Yes
- **LEL**: 2.0 %
- **Flash point**: 171 F
- **UEL**: 11.5 %
- **Autoignition Temp.**: Not given
- **Explosion sensitivity to impact**: Stable.
- **Explosion sensitivity to static electricity**: Not given.
- **Hazardous combustion product**: Emits toxic fumes of NOx
- **Hazardous polymerisation**: Not given.
- **Combustible liquid**: Yes
- **Flammable material**: Yes
- **Explosive material**: No
- **Corrosive material**: No
- **Oxidiser**: No
- **Pyrophoric material**: No
- **Inorganic material**: No

## 4. REACTIVITY DATA

- **Chemical Stability**: Stable
- **Incompatibility**: Strong oxidisers with other material
- **Reactivity**: Can react vigorously with oxidising materials
- **Hazardous Reaction**: Not available.
- **Product**: 
5. **HEALTH HAZARD DATA**

Routs of Entry: Inhalation, Ingestion, eye and skin.

Effects of: Inhalation at high concentration causes nose and throat irritation. Eye and skin irritation on exposure.

Emergency Treatment: Remove the victim to the fresh air area, if breathing has stopped, administers artificial respiration and oxygen if necessary. Keep the victim warm and quiet. Do not give stimulants. Eyes: Flush thoroughly with plenty of water for 15 mins. Skin: Remove the contaminated clothing immediately and flush the affected area with large amount of water. Seek medical aid.

LD 50 (Oral-Rat): 5090 mg/kg

STEL: Not listed

LDV (ACGIH): 10 PPM

Odour Threshold: Not listed

6. **PREVENTIVE MEASURES**

Avoid contact with liquid and vapours.

Personal Protective Equipment: Provide moulded rubber acid resistant hand gloves, apron, shoes, face shield.

Handling and Storage: Keep the chemicals away from heat, flame, oxidising material.

7. **EMERGENCY / FIRST AID MEASURES**

FIRE

| Fire extinguishing: CO2, Dry Chemical Powder, Foam Media. | Special Procedures: Keep the container cool by spraying water. If exposed to heat or flame. |

EXPOSURE

| First Aid Measures: Remove the victim to the fresh air area, if breathing has stopped, administers artificial respiration and oxygen if necessary. Keep the victim warm and quiet. Do not give stimulants. Eyes: Flush thoroughly with plenty of water for 15 mins. Skin: Remove the contaminated clothing immediately and flush the affected area with large amount of water. Seek medical aid. Antidotes/Dosages: Not available. |

SPILLS | Steps to be taken: Shut of leaks if without risk. Contain the liquid on sand or earth. Waste Disposal: Seal all waste in vapour tight plastic bags for eventual disposal. |

8. **ADDITIONAL INFORMATION / REFERENCES**

Nothing special in addition to above given.

9. **MANUFACTURERS/SUPPLIERS DATA**

NAME OF FIRM: Rashtriya Chemicals and Fertilisers Ltd., Thal Unit - Alibag, Dist. Raigad. Maharashtra

TEL No. 02141 - 238001 FAX 238091

IPD TEL 25523161 FAX 24045134

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CHEMICAL NAME : **ARGON (Pressurised cryogenic liquid)**

| C.A.S. No | 7440371 |
| UN No | 1951 |

1. **CHEMICAL IDENTITY** :
   - **Chemical Name** : ARGON
   - **Synonyms** : ARGON, Liquid Pressurised
   - **Trade Name** : N/A
   - **Formula** : Ar.
   - **Regulated Identification** :
     - **Shipping name** : Liquid Argon
     - **Hazchem code** : 2RE
     - **Label** : Inflammable Gas
     - **Hazardous Waste ID No** : N/A
   - **Hazardous Ingredients** : NIL
   - **C.A.S. No** :
   - **N/A**

2. **PHYSICAL/CHEMICAL DATA**
   - **Boiling Pt** : -185.7
   - **Physical state** : Liquefied gas
   - **Appearance** : Soft Silvery White Metal
   - **Melting/Freezing pt** : -189.2 C
   - **Vapour Pr. (mm Hg)** : Lighter than air
   - **Specific Gravity (Water=1)** : 1.784
   - **Vapour Density (Air=1)** : N.A.
   - **Solubility in water** : Insoluble
   - **pH** : N/A

3. **FIRE AND EXPLOSION HAZARD DATA - NON Flammable**
   - **Flammability** : LEL : % N/A
   - **Flash point** : UEL : % N/A
   - **Auto ignition Temp.** : N/A
   - **Explosion sensitivity to impact** : No.
   - **Explosion sensitivity to static electricity** : No.
   - **Hazardous combustion product** : N/A
   - **Hazardous polymerisation** : N/A
   - **Combustible liquid** : NO
   - **Flammable material** : N/A
   - **Corrosive material** : NO
   - **Explosive material** : NO
   - **Oxidiser** : NO
   - **Pyrophoric material** : No.
   - **Inorganic material** : YES

4. **REACTIVITY DATA**
   - **Chemical Stability** : Inert
   - **Incompatibility** : None
   - **Reactivity** : None
   - **Hazardous Reaction Product** : N/A

5. **HEALTH HAZARD DATA**
   - **Routes of Entry** : Inhalation
   - **Effect of exposure** : Frost Bite (cold burns), Respiratory ailments. At ambient temp. liquid converts to gas, at 50 % conc of gas 2/3 % of Oxygen gets displaced. At 75% conc is fatal in minutes.
   - **Due to asphyxia mental alertness is diminished and muscular coordination is impaired. As asphyxia is progresses there may be nausea and vomiting, prostration and loss of consciousness and finally convulsions deep coma and death**
   - **TLV (8-hours)** : N/A
   - **STEL(15min)** : N/A
6. **PREVENTIVE MEASURES**

   **Personal Protective Equipment**: To avoid exposure personnel must be equipped with special clothing designed to prevent freezing of body tissue. Full body protection. Respiratory protective equipment is must when handling leakage.

   **Handling and Storage**: Storage area should be dry and well ventilated.

   **Precautions**: Cryogenic liquid can be vaporised rapidly at ambient temp. One must consider the consequences of rapidly filling an inhabited space with vapour i.e. displacement of Oxygen. Rescue operation shall be carried out with proper full body and respiratory protection.

7. **EMERGENCY / FIRST AID MEASURES**

   **FIRE**
   - Fire extinguishing:
   - **Special Procedures**:

   **EXPOSURE**
   - First Aid Measures:
     - In case of exposure to liquid wash affected area with water.
     - In case of asphyxia remove victim to fresh air.
     - Give artificial respiration if unconscious and call medical aid.

   **SPILLS**
   - Steps to be taken:
     - Restrict access to the area.
     - Clean-up by trained personnel only.
     - Disperse gas with water spray.

   **Antidotes/Dosages**:

   **Waste Disposal**

8. **ADDITIONAL INFORMATION / REFERENCES**

9. **MANUFACTURERS/SUPPLIERS DATA**

   **NAME OF FIRM**
   - Rashtriya Chemicals and Fertilisers Ltd.,
     - Trombay Unit- Chembur, Mumbai 400074
     - Thal Unit - Alibag, Dist. Raigad. Maharashtra

   **TEL No.**
   - 25522245   **FAX** 25522231
   - 02141 - 238001   **FAX** 238091
   - IPD TEL 25523161   **FAX** 24045134

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8. **EMERGENCY / FIRST AID MEASURES**

**FIRE:** Flood with water or use appropriate medium for extinguishing surrounding fire.

**Special Procedures:** Fire fighter should wear self-contained breathing apparatus and full protecting clothing. Use water spray to cool, near by container and structure expose to fire. This product may fuse or melt in large fires and using water to extinguish may cause the scattering of molten material. In such conditions, water should not be applied to molten salt baths.

**EXPOSURE:**

**First Aid Measures:** If inhaled: Remove to fresh air. Give artificial respiration if not breathing. In case of eye contact, immediately flush eyes with lots of running water for 15 minutes. Lifting upper and lower eyelids occasionally. If swallowed - if conscious, immediately induce vomiting by giving 2 glasses of water and sticking a finger down the throat. Get immediate medical attention. Do not give anything to an unconscious or convulsing person.

**Antidotes/Dosages:** Not available.

**SPILLS**

**Steps to be taken:** Wear protective equipments including rubber shoes, rubber gloves, rubber apron and a self contained breathing apparatus. (Pressure demand mode) or a supplied air respirator. If spill or leak is small, a full-face piece air purifying cartridge respirator equipped with particular filters may be satisfactory. Always wear eye protection. For small spill, sweep up and dispose off into proper containers. For large spill, shovel into proper container. Keep out of sewers, storm drains, surface water and soils. **Avoid friction, heat or shocks.**

**Waste Disposal:** Dispose off contaminated product and materials used in cleaning up spill or leaks in a manner approved for these materials. **Avoid friction, heat or shocks.**

9. **ADDITIONAL INFORMATION / REFERENCES**

**Disaster Hazard:** Dangerous due to Fire & Explosion hazard. If decomposition takes place in large amount, disastrous situation may take place due to toxic fumes of Nox. Avoid friction, heat or shocks. Avoid contact with acids, organic materials & reducing agents.

**References (Source of information):**

Dangerous Properties of Industrial Materials (VIth Edition) - N. Irving Sax
MSDS by Canadian Centre for Occupational Heath & Safety

10. **MANUFACTURERS/SUPPLIERS DATA**

**NAME OF FIRM** Rashtriya Chemicals and Fertilisers Ltd., Trombay Unit- Chembur, Mumbai 400074

**TEL No.** 25522245  **FAX** 25522231

**IPD TEL** 25523161  **FAX** 24045134

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MATERIAL SAFETY DATA SHEET

CHEMICAL NAME : AMMONIUM BICARBONATE
C.A.S. No : 10766337
UN No : Not available

1. CHEMICAL IDENTIFICATION:
   Chemical Name : Ammonium Bicarbonate
   Synonyms : Ammonium Hydrogen Carbonate
   Trade Name : Ammonium Bicarbonate
   Formula : $\text{NH}_4 \text{HCO}_3$
   Regulated Identification : Ammonium Bicarbonate
   Shipping name : Ammonium Bicarbonate
   Hazchem code : --
   Label : --
   Hazardous Waste ID No : 17
   Hazardous Ingredients : Ammonium Bicarbonate
   C.A.S. No : 10766337

2. PHYSICAL/CHEMICAL DATA
   Boiling Pt : NA
   Appearance : White
   Melting/Freezing pt : 107.5\degree C
   Vapour Pr. (mm Hg) : NA
   Specific Gravity : (Water = 1)
   Vapour Density : (Air = 1)
   pH : NA
   Solubility in water : Soluble

3. FIRE AND EXPLOSION HAZARD DATA - Non Flammable
   Flammability : NO
   LEL : --\%
   Flash point : NA
   UEL : --\%
   Auto ignition Temp. : NA
   Explosion sensitivity to impact : NA
   Explosion sensitivity to static electricity : NA
   Hazardous combustion product : On decomposition emits NOx & Ammonia
   Hazardous polymerisation : NA
   Combustible liquid : NO
   Flammable material : NO
   Corrosive material : NO
   Explosive material : NO
   Oxidiser : NO
   Pyrophoric material : NO
   Inorganic material : YES

4. REACTIVITY DATA.
   Chemical Stability : Stable at room temp., volatile, decomposes at 60 \degree C
   Incompatibility : Not Available
   Reactivity : Not Available
   Hazardous Reaction : Not Available
   Product.
5. HEALTH HAZARD DATA (Used as a Food Additive)
   Routs of Entry: Inhalation, Ingestion.
   Effect of exposure : NA
   TLV (8-hours) : Not Applicable
   STEL(15min) : Not Applicable
   LD50 - MUS 245 mg/kg

6. PREVENTIVE MEASURES:
   Personal Protective Equipment : Dust Mask
   Handling and Storage: Store in well-ventilated area away from source of the heat.
   Precautions:

7. EMERGENCY / FIRST AID MEASURES
   FIRE
   Fire extinguishing : Use Water spray.
   Special Procedures: In case of decomposition and emission of toxic fumes of NOx, NH3 use Self-contained Breathing Apparatus.
   EXPOSURE
   First Aid Measures: - If exposed to Ammonia, remove victim to fresh air
   Antidotes/Dosages: . Not Available
   SPILLS
   Steps to be taken : - Collect in drums
   Waste Disposal : After collection, residuals, wash it with water
   Methods

8. ADDITIONAL INFORMATION / REFERENCES

9. MANUFACTURERS/SUPPLIERS DATA
   NAME OF FIRM
   Rashtriya Chemicals and Fertilisers Ltd., Trombay Unit- Chembur, Mumbai 400074
   TEL No. 25522245 FAX 25522231

   IPD TEL 25523161 FAX 24045134

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MATERIAL SAFETY DATA SHEET

CHEMICAL NAME: AMMONIA

C.A.S. No: 7664-41-7
UN No: 1005

1. CHEMICAL IDENTITY:

   Chemical Name: AMMONIA
   Synonyms: Liquid Ammonia, Ammonia Gas, Ammonia Anhydrous
   Trade Name: 
   Formula: NH₃
   Regulated Identification | Shipping name AMMONIA
   | Hazchem code: 2 PE
   | Label: Non Flammable Gas, Class 2
   | Hazardous Waste ID No: 17
   Hazardous Ingredients: 
   C.A.S. No: 7664-41-7

2. PHYSICAL/CHEMICAL DATA

   Boiling Pt: -33.4 °C
   Physical state: Liquified Compr. Gas
   Appearance: Colourless
   Melting/Freezing pt: -77.77 °C
   Vapour Pr. (mm Hg): Specific Gravity: 0.771
   Vapour Density: 0.60 (Water = 1) Very soluble
   (Air = 1) pH: 1N aq.Sol.11.6
   Solubility in water: 

3. FIRE AND EXPLOSION HAZARD DATA - NON Flammable

   Flammability: NO
   LEL 16.0 %
   Flash point: °C
   Not pertinent
   UEL 25.0 %
   Auto ignition Temp. °C 651.0
   Explosion sensitivity to impact: Stable
   Explosion sensitivity to static electricity: Not available
   Hazardous combustion product: Emits toxic fumes of NH₃ & NOₓ
   Hazardous polymerisation: Will not occur
   Combustible liquid: YES
   Flammable material: NO
   Corrosive material: NO
   Explosive material: NO
   Oxidiser: NO
   Pyrophoric material: NO
   Organic Peroxide: NO

4. REACTIVITY DATA.

   Chemical Stability: Stable
   Incompatibility: Strong oxidisers, Calcium, hypochlorite, Gold, Mercury, Silver,
   Halogens, Acetaldehyde, Acrolein
   Reactivity: Reacts with silver chloride, silver nitrate, silver azide, chlorine, bromine, iodine, heavy metals and their compounds. Incandescent reaction when heated with calcium.
   Hazardous Reaction: Reaction with silver chloride, silver nitrate, silver azide and silver oxide from explosive silver nitride.
5. **HEALTH HAZARD DATA**

**Routes of Entry:** Inhalation, Skin or Eyes

**Effect of exposure:** 700 ppm causes eye irritation and permanent injury. May result if prompt medical remedial measures are not Taken. 5000ppm may cause death from spun inflammation, or edema of the larynx. Contact of the liquid with skin freezes the tissues and causes the caustic burns.

**Emergency Treatment:** Inhalation: Remove the victim to fresh air area and provide artificial respiration or oxygen, if needed. Skin and Eyes: Wash the affected area with plenty of water for 15 mins. Seek Medical Aid.

**LD₅₀ (Oral-Rat):** 350 mg/kg

**Permissible Exposure Limit:** 25 ppm 18 mg/m³

**Odour Threshold:** 46.8 ppm 32.53 mg/m³

**STEL(15min):** 35ppm 27 mg/m³

**TLV(ACGIH):** 25 ppm 18 mg/m³

**NFPA Hazard Signals:** Health: 2  Flammability: 1  Reactivity: 0  Special:

6. **PREVENTIVE MEASURES:**

**Personal Protective Equipment:** Avoid contact with liquid or vapours. Provide rubber boots, safety goggles, self-contained Breathing apparatus, gas mask and protective clothing in case of liquid Ammonia.

**Handling and Storage:** Avoid storing along with oxidizing materials and away from all possible sources of ignition. Store in well ventilated, flame resistant locations.

7. **EMERGENCY / FIRST AID MEASURES**

**FIRE:**

| Fire extinguishing Media | Stop flow of gas. Use water spray or fog.
| Special Procedures: Keep the containers cool by spraying water if exposed to heat or flame.
| Unusual Hazards Gas is suffocating

**EXPOSURE:** Inhalation: Remove the victim to fresh air area, provide artificial respiration or oxygen, if needed. Skin: Remove the contaminated clothes and was the affected area with plenty of water and soap. Eyes: Flush with plenty of water for 15 mins. Seek Medical Aid.

**Antidotes/Dosages:** Not available

**SPILLS:** Contain leaking liquid on sand or earth, allow to evaporate. Dilute the vapours with plenty of water.

**Waste Disposal Methods:** Seal all waste in vapour tight plastic bags for eventual disposal.
8. ADDITIONAL INFORMATION / REFERENCES

LCLO: 30,000 ppm/SM(ihl-hmn). A human poison by an unspecified route. Difficult to ignite. \( \text{NH}_3 \) and air in a fire, can detonate. Potentially violent or explosive reactions on contact with interhalogens. Forms sensitive explosive mixture with air and hydrocarbons. Those affected with eye and pulmonary diseases should avoid exposure to Ammonia.

9 MANUFACTURERS/SUPPLIERS DATA

<table>
<thead>
<tr>
<th>NAME OF FIRM</th>
<th>Rashtriya Chemicals and Fertilisers Ltd., Trombay Unit- Chembur, Mumbai 400074 Thal Unit - Alibag, Dist. Raigad. Maharashtra</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
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</tr>
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10 DISCLAIMER (Source of Data: Irvin Sax)

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*****
# MATERIAL SAFETY DATA SHEET

**CHEMICAL NAME**: CALCIUM CARBONATE  
**C.A.S. No**: 1317653  
**UN No**: Not Listed

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### 1. CHEMICAL IDENTITY:
- **Chemical Name**: CALCIUM CARBONATE  
- **Synonyms**: CHALK, DOMOLITE, LIMESTONE  
- **Trade Name**: CALCIUM CARBONATE (CHALK)  
- **Formula**: Ca CO3  
- **C.A.S. No**: 1317653  
- **UN No**: Not Listed  
- **Regulated Identification**:  
  - **Shipping name**: -- CALCIUM CARBONATE / LIMESTONE  
  - **Hazchem code**: -- Not listed  
  - **Code/ Label**: -- Not listed  
  - **Hazardous Waste ID No**: --  
- **Hazardous Ingredients**: CALCIUM CARBONATE (C.A.S. No: 1317653)

---

### 2. PHYSICAL/ CHEMICAL DATA
- **Boiling Pt**: -- Not Available  
- **Physical state**: Solid  
- **Appearance**: White powder  
- **Melting/Freezing pt**:  
- **Vapour Pr. (mm Hg)**: -- Not Available  
- **Specific Gravity**: -- Not Available  
- **Vapour Density**: -- Not Available  
- **Solubility in water**: Soluble  
- **@ 30 °C**:  
- **PH**: -- : Not Pertinent  
- **Solubility in water**:  
- **pH**: -- : Not Pertinent

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### 3. FIRE AND EXPLOSION HAZARD DATA
- **Flammability**: Non Flammable  
- **Flash point**:  
- **Autoignition Temp.**: Not Pertinent  
- **Explosion sensitivity to impact**: Stable  
- **Explosion sensitivity to static electricity**: Stable  
- **Hazardous combustion product**: Not pertinent  
- **Hazardous polymerisation**: Will not occur  
- **Combustible liquid**: NO  
- **Flammable material**: NO  
- ** Explosive material**: NO  
- **Corrosive material**: NO  
- **Oxidiser**: NO  
- **Pyrophoric material**: NO  
- **Inorganic material**: NO

---

### 4. REACTIVITY DATA.
- **Chemical Stability**: Stable  
- **Incompatibility**: Fluorine  
- **With other material Reactivity**: Stable  
- **Hazardous Reaction**: Reacts violently with F2, (Mg + H2)  
- **Product**: 
5. **HEALTH HAZARD DATA**
   Routs of Entry: Inhalation (dust), Ingestion, Skin absorption and eye
   Effects of: Not Pertinent
   Exposure/Symptoms:
   Emergency Treatment: Exposed parts to be washed with water.

   LD 50 (Oral-Rat): -- Not Pertinent mg/kg
   STEL: -- Not Pertinent
   TLV(ACGIH): -- Not Pertinent ppm
   Odour Threshold: -- Not Pertinent

6. **PREVENTIVE MEASURES**:
   Personal Protective Equipment: Use Dust masks, Goggles, Gloves and coverall.
   Handling and Storage: Precautions.

7. **EMERGENCY / FIRST AID MEASURES**
   FIRE | Fire extinguishing: Non flammable Media.
   | Special Procedures:
   EXPOSURE | First Aid Measures: Wash exposed parts with plenty of water. See medical aid.
   | Antidotes/Dosages: Not Available.
   SPILLS | Steps to be taken: Collect in Jute / HDPE bags.
   | Waste Disposal: Not Pertinent

8. **ADDITIONAL INFORMATION / REFERENCES**
   Nothing special in addition to above given.

9. **MANUFACTURERS/SUPPLIERS DATA**
   NAME OF FIRM: Rashtriya Chemicals and Fertilisers Ltd., Trombay Unit- Chembur, Mumbai 400074
   TEL No. 25522245 FAX 25522231
   IPD TEL 25523161 FAX 24045134

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MATERIAL SAFETY DATA SHEET

CHEMICAL NAME : METHANOL
C.A.S. No : 67-56-1
UN No : 1230

1. CHEMICAL IDENTITY :
   Chemical Name: METHANOL
   Synonyms : Methyl Alcohol, Wood Alcohol, Wood, Spirit, Colonial Spirit
   Trade Name :
   Formula : CH₃OH
   Regulated Identification |
   Shiping name : Methanol |
   Hazchem code : 2PE |
   Code/ Label : Flammable liquid, Class 3 |
   Hazardous Waste ID No: 17
   Hazardous Ingredients Methyl Alcohol :

2. PHYSICAL/CHEMICAL DATA
   Boiling Pt : 64.5 °C
   Physical state : Liquid
   Appearance : Colourless, watery
   Melting/Freezing pt : -97.8 °C
   Vapour Pr. (mm Hg) : @ 35 °C 100mm Hg at 21.2°C
   Vapour Density : 1.10 @ 30 °C (Liq)
   Vapour Pt (Air = 1) :
   pH :
   Solubility in water : Miscible @ 30 °C

3. FIRE AND EXPLOSION HAZARD DATA
   Flammability : YES LEL : 6 %
   Flash point : °C 16.1 (OC). UEL : 36.5 %
   Flash point : °C 12.2 (CC) TDG Flammability : 3
   Autoignition Temp. : 0 C 463.8
   Explosion sensitivity to impact : Stable
   Explosion sensitivity to static electricity : Vapours are explosive
   Hazardous combustion product : Emits acrid smoke and irritating fumes
   Hazardous polymerisation : Will not occur
   Combustible liquid : YES Flammable material : YES
   Explosive material : NO Corrosive material : NO
   Oxidiser : NO Pyrophoric material : NO
   Organic Peroxide : NO

4. REACTIVITY DATA.
   Chemical Stability : Stable
   Incompatibility : Strong Oxidisers, Beryllium Dihydride, Metals(K,Mg), Carbon
   Tetrachloride+Metals(al,Mg,Zn), Dichloromethane, Oxidants
   Reactivity : Violent reaction with Alkyl Aluminium Salts, Acetyl Bromide,
   Chloroform+NaOH, CrO₃, Nitric Acid, HClO₄, P₂O₅
   Hazardous Reaction Product : Not available
5. **HEALTH HAZARD DATA**

**Routes of Entry**
- Inhalation, Ingestion, Eyes, Skin

**Effects of Exposure**
- Exposure to vapours causes eye irritation, headache, fatigue
- Drowsiness. High concentration can produce central nervous system depression and optic nerve damage. 50,000 ppm will probably cause death in 1-2 hrs. Can absorb through skin.

**Emergency Treatment**
- Swallowing may cause death or eye damage.
- Inhalation: Remove the victim from exposed area & apply artificial respiration if breathing has stopped. Ingestion: Induce vomiting, give 2 teaspoons of baking soda in a glass of water. Skin or Eyes: Flush with plenty of water for 15 minutes. Seek Medical Aid.

| LD 50 (Oral-Rat) | 5628 mg/kg
| STEL | 250(Skin) ppm 310(Skin)mg/m³
| Permissible Exposure Limit: | 200(Skin) ppm 200(Skin) mg/m³
| TLV (ACGIH): | 200(Skin) PPM 200(Skin) mg/m³
| Odour Threshold: | 100 ppm 130.87 mg/m³

6. **PREVENTIVE MEASURES**

**Personal**
- Avoid contact with liquid or vapours

**Protective Equipment**
- Provide air-supplied respirator (Do not use organic canister mask), wear boots, safety goggles, protective apron and rubber gloves. Provide eye wash and basin nearby.

**Handling and Storage**
- Store away from heat, ignition source, sparks. Keep away from heat and flame.

7. **EMERGENCY / FIRST AID MEASURES**

**FIRE**
- **Fire extinguishing Media:** CO₂, Dry chemical powder, Alcohol Foam, Water Mist Fog.
- **Special Procedures:** Keep the containers cool by spraying water if exposed to heat or flame.
- **Unusual Hazards:** Containers may explode in fire.

**EXPOSURE**
- **First Aid Measures:** If substance entered the eyes, immediately wash with plenty of water for 15 minutes. If skin is affected, remove the soaked clothes and wash the affected area with plenty of water and soap. If inhaled, remove the victim to fresh air area. Seek Medical Aid immediately.
- **Antidotes/Dosages:** Baking soda in glass of water.

**SPILLS**
- **Steps to be taken:** Shut off leaks if without risks. Drench with water
- **Waste Disposal:** Seal all waste in vapour tight plastic bags for eventual disposal.

8. **ADDITIONAL INFORMATION / REFERENCES**

A human poison by ingestion. Poison also by skin contact. The main toxic effect is extended to the nervous system, particularly optic nerves & retina which may lead to permanent blindness. Once absorbed, it is slowly eliminated. Coma by severe exposure may last for 2-4 days. Persons with eye, liver, kidney & lung problems should avoid contact. Periodic medical check up is recommended. Dangerous fire hazard when exposed to heat, flame and oxidisers.
9 MANUFACTURERS/SUPPLIERS DATA

NAME OF FIRM  Rashtriya Chemicals and Fertilisers Ltd.,
               Trombay Unit- Chembur, Mumbai 400074
               TEL No. 25522245  FAX 25522231
IPD  TEL 25523161  FAX 24045134

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any particular purpose
MATERIAL SAFETY DATA SHEET

CHEMICAL NAME: AMMONIUM NITRATE
C.A.S. No : 6484-52-2
UN No : 1942

1. CHEMICAL IDENTITY:
   Chemical Name : Ammonium Nitrate
   Synonyms : Nitram, Nitric Acid, Ammonium Salt
   Trade Name
   Formula : NH₄NO₃  C.A.S. No 6484-52-2  UN No 1942
   Regulated Identification | Shipping name : Ammonium Nitrate
   | Hazchem code : S
   | Code/ Label : Oxidiser, Class 5. Flammable liquid
   | Hazardous Waste ID No: 17
   Hazardous Ingredients : Ammonium Nitrate
   C.A.S. No : 6484-52-2

2. PHYSICAL/CHEMICAL DATA
   Boiling Pt/Range : Decomp. > 210°C  Physical state : Solid
   Appearance : Grayish white crystals  Melting/Freezing pt : 169.6°C
   Vapour Pr. (mm Hg) : @ 35°C  Specific Gravity : 1.72 @ 25°C
   Vapour Density : Not pertinent (Water = 1)
   (Air = 2)  pH 0.1 M Soln. 5.43 : Solubility in water : Soluble @ 30°C
   Odour: Odourless  Others: Soluble in alcohol and methanol

3. FIRE AND EXPLOSION HAZARD DATA
   Flammability : NO  LEL : Not pertinent %
   Flash point (°C) : Not pertinent (OC).  UEL : Not pertinent %
   Flash Point (°C) : Not pertinent (CC)
   Autoignition Temp. °C : Not pertinent
   Explosion sensitivity to impact : Stable
   Explosion sensitivity to static electricity : Stable
   Hazardous combustion product : Emirates highly toxic fumes of NOₓ
   Hazardous polymerisation
   Combustible liquid : NO  Flammable material : NO
   Explosive material : NO  Corrosive material : NO
   Oxidiser : Yes  Pyrophoric material : NO
   Inorganic material :
4. **REACTIVITY DATA.**
Chemical Stability: Stable
Incompatibility: With\((NH_4)Cl+Heat\), Organic Matter, P, NaOCl, NaClO_4
with other material
Reactivity: Spontaneous reaction with Acetic anhydride+Nitric Acid, Ammonium Sulfate+K.Copper, Iron(II) sulfide, Saw dust, urea, barium nitrate, hot water, ammonium chloride+water, ammonium chloride+water+Zn
Hazardous: Reaction with alkali metals forms an explosive product.

5. **HEALTH HAZARD DATA**
Routs of Entry: Inhalation, Ingestion, Eyes
Effects of: Causes irritation of eyes and mucous membrane.
Exposure/Symptoms: Absorption via inhalation or ingestion causes urination or acid urine. Large amount causes systematic acidosis and methemoglobinemia.
Emergency Treatment: Remove the victim from the exposure-Symptoms are reversible. Seek medical aid.
Odour Threshold: Odourless
NFPC Hazard: Signals Health 2
Flammability: 0 Reactivity: 3 Special: Oxy

6. **PREVENTIVE MEASURES:**
Personal Protective Equipment: Avoid contact with solid or dust. Provide full personal protective equipment such as hand gloves, face shield, self-contained breathing apparatus. Body overclothing and shoes.
Handling and Storage: A relatively stable explosive, which has however caused many industrial explosions. It is important that the mass of the materials be kept cool. Well ventilated. Prevent contact with combustible substances and reducing materials.

7. **EMERGENCY / FIRST AID MEASURES**
| Special Procedures:
EXPOSURE | First Aid Measures: Remove victim from the exposed area to fresh air-symptoms are reversible. Seek medical aid
| Antidotes/Dosages: Not available.
SPILLS | Steps to be taken: Transfer spillage into large container of water. Add soda ash and neutralize with HCL. After few hours can be drained with large amount of water.
| Waste Disposal: Slowly collect the material and seal in vapour tight plastic bags
| Waste Disposal Methods for eventual disposal
8. ADDITIONAL INFORMATION / REFERENCES
A powerful oxidizer. A relatively stable explosive which has however, caused industrial
explosions. Forms heat or shock sensitive. Explosive mixtures with acetic
acid. Aluminium + Calcium + Formamide (a blasting explosive).
Ammonia, charcoal + Metal oxides, Chloride salts, fertilizers, hydrocarbon oils, powdered
metals, non-metals, organic fuels, potassium permanganate, sugar, sulphur and
trinitroanisole. Reaction with Alkali metals forms an explosive product. Ignites on contact
with Ammonium Potassium dichromate, Potassium chromate, Barium chloride, sodium
chloride, potassium nitrate and chromium (VI) salts. Can ignite when mixed with acetic
acid. Occasional explosions in presence of oils. \( \text{(NH}_4\text{)}\text{2SO}_4 \), with K or Na.

9 MANUFACTURERS/SUPPLIERS DATA
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Rashtriya Chemicals and Fertilisers Ltd.,
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TEL No. 25522245  FAX 25522231

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