Section 1: Product & Company Information

Product Identifier: n-Methyl Pyrrolidone

Other Means of Identification
Product Number: No data available.

Recommended Use and Restrictions on Use
Recommended Use: No data available.
Restrictions on Use: No data available.

Manufacturer/Importer/Supplier/Distributor Information
Company Name: CORECHEM Inc.
Address: 4520 Greenway Drive
Knoxville, TN 37918
USA

Information Telephone Number: 1-865-524-4239
Fax Number: 1-865-524-3375
Website: www.corecheminc.com
Contact Person: Regulatory Manager
E-mail: regulatory@corecheminc.com

Emergency Phone Number: Chemtrec™ 1-800-424-9300/ Outside USA 1-703-527-3887 (monitored 24 hours/day)

Section 2: Hazards Identification

GHS Hazard Classification(s)

Physical Hazard(s)
Not classified.

Health Hazard(s)
Corrosion/Irritation, Skin - 2
Corrosion/Damage/Irritation, Eye - 2A
Toxic to Reproduction - 1
Specific Target Organ Toxicity (STOT) Respiratory Irritation, Single exposure - 3

Environmental Hazard(s)
Not classified.

Label Elements
Signal Word
DANGER

Hazard Symbol(s)

Hazard Statement(s)
H315: Causes skin irritation.
H319: Causes serious eye irritation.
H335: May cause respiratory irritation.
H360: May damage fertility or the unborn child.

Precautionary Statements
General
Not applicable.

Prevention
P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P261: Avoid breathing dust/fume/gas/mist/vapors/spray.
P264: Wash face, hands and any exposed skin thoroughly after handling.
P271: Use only outdoors or in a well-ventilated area.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P281: Use personal protective equipment as required.

Response
P302 + P352: IF ON SKIN: Wash with plenty of soap and water.
P304 + P340: IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.

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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.
P312: Call a POISON CENTER or doctor/physician if you feel unwell.
P321: Specific treatment (see supplemental first aid instructions on this label).
P332 + P313: IF skin irritation occurs: Get medical advice/attention.
P337 + P313: IF eye irritation persists: Get medical advice/attention.
P362: Take off contaminated clothing and wash before reuse.

Storage
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P405: Store locked up.

Disposal
P501: Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Hazard(s) not otherwise classified (HNOC)
None known.

Section 3: Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Substance</th>
<th>Chemical Identity *</th>
<th>Common Name/Synonym(s)</th>
<th>CAS #</th>
<th>Weight %</th>
<th>Impurity or Stabilizing Additive</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Methyl-2-Pyrroldione</td>
<td>-</td>
<td>-</td>
<td>872-50-4</td>
<td>99-100%</td>
<td>No</td>
</tr>
</tbody>
</table>

1. Information regarding the composition and the percent ranges of the mixtures ingredients are not presented as it Confidential Business Information (CBI). Where a medical emergency exists (as determined by medical professional), timely disclosure of CBI is assured. The information omitted pertains to only the names of the substances and the concentration in the mixture (product) and can only be requested by a doctor/physician or Local/State/Provincial or Federal Authority.
2. Non-hazardous ingredients are not presented as to protect the proprietary formula of the product.
3. *—Indicates ingredient is a mixture and contains multiple ingredients or may have no identifying CAS number.

Section 4: First-Aid Measures

General Information
Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Wash contaminated clothing before reuse.

Inhalation
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

Skin Contact
Take off immediately all contaminated clothing. Wash off IMMEDIATELY with plenty of water for at least 15-20 minutes. Get medical attention immediately! Wash clothing separately before reuse. Destroy or thoroughly clean contaminated shoes.

Eye Contact
Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician or poison control center immediately.

Ingestion
Call a physician or poison control center immediately. Rinse mouth. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

Most important symptoms/effects, acute and delayed
Symptoms
Irritating to eyes, respiratory system and skin.

Indication of immediate medical attention and special treatment needed
Hazards
No data available.

Treatment
Treat symptomatically. Symptoms may be delayed.

Section 5: Fire-Fighting Measures

General Fire Hazards
In case of fire and/or explosion do not breathe fumes.

Suitable (and Unsuitable) Extinguishing Media
Suitable Extinguishing Media
Extinguishing powder, alcohol resistant foam, carbon dioxide, water fog

Unsuitable Extinguishing Media
No data available.

Specific Hazards Arising from the Chemical
This product is not flammable. May burn, but does not ignite readily.

Special Protective Equipment and Precautions for Firefighters
Section 6: Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures
Evacuate spill area. Isolate hazard area and deny entry to unnecessary or unprotected personnel. Stay upwind and keep out of low area. Remove all possible sources of ignition in the surrounding area. Wear appropriate personal protective equipment. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. See Section 8 of the SDS for Personal Protective Equipment. Ventilate contaminated area thoroughly. Shut off leaks if possible without personal risk.

Methods and Materials for Containment and Clean-Up
Absorb spill with vermiculite or another inert material, then place in a container for chemical waste. Clean surface thoroughly to remove residual contamination. Dike far ahead of larger spill for later recovery and disposal.

Notification Procedures
In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

Environmental Precautions
Do not contaminate water sources or sewer. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.

Section 7: Handling and Storage

Precautions for Safe Handling
Use caution when handling/transferring. Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Do not breathe mist or vapor. Use only with adequate ventilation. Wear appropriate personal protective equipment. Transfer and storage systems should be compatible. Observe good industrial hygiene practices.

Conditions for Safe Storage, including any Incompatibilities
Keep container tightly closed. Store in a cool, dry, well-ventilated place. Store away from incompatible materials (See Section 10). Ensure that all local regulations regarding handling and storage facilities are followed.

Section 8: Exposure Controls/Personal Protection

Control Parameters
Occupational Exposure Limits
The product does not contain any relevant quantities of hazardous materials with critical values that have to be monitored in the workplace.

Biological Limit Values

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>CAS #</th>
<th>Parameter</th>
<th>Value</th>
<th>Biological Specimen</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Methyl-2-Pyrrolidone</td>
<td>872-50-4</td>
<td>5-Hydroxy-N-methyl-2-</td>
<td>100 mg/l</td>
<td>Urine</td>
<td>ACGIH – Biological Exposure Indices (BEI)</td>
</tr>
</tbody>
</table>

| Remarks: Sampling time: End of shift |

Appropriate Engineering Controls
No data available.

Individual protection measures, such as personal protective equipment (PPE)

General Information
Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Eye wash facilities and emergency shower must be available when handling this product.

Eye/Face Protection
Wear safety glasses with side shields (or goggles) and a face shield. Wear a full-face respirator, if needed.

Skin Protection
Hand Protection
- Wear appropriate chemical resistant gloves.

Other
- Wear appropriate chemical resistant clothing.

Respiratory Protection
If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. Air-purifying respirator with an appropriate, government approved (where applicable), air-purifying filter, cartridge or canister. Contact health and safety professional or manufacturer for specific information.

Hygiene Measures
When using, do not eat, drink or smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated footwear that cannot be cleaned. Wash hands before breaks and immediately after handling the product. Wash contaminated clothing before reuse. Avoid contact with eyes, skin, and clothing.
Section 9: Physical and Chemical Properties

- **Appearance:**
  - Physical State: Liquid
  - Color: Colorless
  - Odor: Amines.
  - Odor Threshold: No data available.
  - pH: 7.7 - 8
  - Melting Point/Freezing Point: -25 °C
  - Initial Boiling Point and Boiling Range: 202 °C (101.3 kPa)
  - Flash Point: 96 °C (Open Cup)
  - Evaporation Rate (butyl acetate = 1): 0.06 (butyl acetate = 1)
  - Flammability (solid, gas): No data available.
  - Upper/Lower Limit on Flammability or Explosive Limits:
    - Flammability Limit – Upper: No data available.
    - Flammability Limit – Lower: No data available.
    - Explosive Limit – Upper: No data available.
    - Explosive Limit – Lower: No data available.
  - Vapor Pressure: 0.05 kPa (25 °C)
  - Vapor Density (air = 1): 3.4 AR = 1
  - Relative Density (water = 1): 1.03 (20 °C)
  - Solubility(iess):
    - Solubility in water: Miscible with water.
    - Solubility (other): No data available.
  - Partition coefficient (n-octanol/water): -0.54
  - Auto-Ignition Temperature: 346 °C
  - Decomposition Temperature: No data available.
  - Viscosity: No data available.

- **Other Information:**
  - Molecular Weight: 99.13 g/mol
  - Formula: C₇H₁₄N₆O₄

Section 10: Stability and Reactivity

- **Reactivity:**
  - No dangerous reaction known under conditions of normal use.

- **Chemical Stability:**
  - Material is stable under normal conditions.

- **Possibility of Hazardous Reactions:**
  - Hazardous polymerization does not occur.

- **Conditions to Avoid:**
  - Excessive heat.

- **Incompatible Materials:**

- **Hazardous Decomposition Products:**
  - Thermal decomposition may produce oxides of carbon and nitrogen.

Section 11: Toxicological Information

- **Information on routes of exposure**
  - **Ingestion:** May be harmful if swallowed.
  - **Inhalation:** Spray mist may irritate the respiratory system.
  - **Skin Contact:** Causes skin irritation.
  - **Eye Contact:** Causes serious eye irritation.

- **Information on Toxicological Effects**
  - **Acute Toxicity (List all possible routes of exposure)**
    - **Oral**
      - n-Methyl Pyrrolidone: LD50 (Mouse): 5,130 mg/kg
      - n-Methyl Pyrrolidone: LD50 (Rat): 3,914 mg/kg
    - **Dermal**
      - n-Methyl Pyrrolidone: LD50 (Rabbit): 8,000 mg/kg
    - **Inhalation**
      - No data available.
    - **Repeated Dose Toxicity**
      - No data available.
Skin Corrosion/Irritation
Causes skin irritation.

Serious Eye Damage/Eye Irritation
Causes serious eye irritation.

Respiratory/Skin Sensitization
Not a skin sensitizer.

Carcinogenicity
IARC Monographs on the Evaluation of Carcinogenic Risks to Humans
No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

US. National Toxicology Program (NTP) Report on Carcinogens
No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)
No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Germ Cell Mutagenicity
In Vitro
No mutagenic components identified.

In Vivo
No mutagenic components identified.

Reproductive Toxicity
May damage fertility or the unborn child.

Specific Target Organ Toxicity – Single Exposure
Respiratory tract irritation.

Specific Target Organ Toxicity – Repeated Exposure
None known.

Aspiration Hazard
Not classified.

Other Effects
None known.

Section 12: Ecological Information

Ecotoxicity
Acute Hazards to the Aquatic Environment
Fish
No data available.

Aquatic Invertebrates
No data available.

Toxicity to Aquatic Plants
No data available.

Chronic Hazards to the Aquatic Environment
Fish
No data available.

Aquatic Invertebrates
No data available.

Toxicity to Aquatic Plants
No data available.

Persistence and Degradability
Biodegradation
This material is expected to biodegrade.

BOD/COD Ratio
No data available.

Bioaccumulative Potential
Bioconcentration Factor (BCF)
No data available on bioaccumulation.

Partition Coefficient n-octanol / water (log Kow)
Log Kow: -0.54

Mobility in Soil
The product is water soluble and may spread in water systems.

Other Adverse Effects
The product components are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

**Section 13: Disposal Considerations**

**Disposal Instructions**
Collect and reclaim or dispose in sealed containers at licensed waste disposal site. This material and its container must be disposed of as hazardous waste. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations.

**Contaminated Packaging**
Handle contaminated packages in the same way as the substance itself. Emptied containers may retain hazardous residue and explosive vapors. Keep away from heat, sparks, and flames. Do not cut, puncture, or weld on or near this container. Follow label warnings until container is thoroughly cleaned or destroyed.

**Section 14: Transportation Information**

**US Department of Transportation (DOT)**
This material is not regulated as a hazardous material for transport by the U.S. Department of Transportation in accordance with 49 CFR 172.101.

**Section 15: Regulatory Information**

**US Federal Regulations**
- **Toxic Substance Control Act (TSCA), Chemical Substance Inventory, Section 8(b)**
  This product or ingredient(s) are listed on the TSCA inventory. Any impurities present in this product are exempt from listing.

- **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Hazardous Substance List (40 CFR 302.4)**
  No chemical(s) in this material are subject to the reporting requirements of CERCLA.

- **Clean Air Act (CAA), Section 112(r)**
  No chemical(s) in this material are subject to the reporting requirements of CAA.

- **Emergency Planning and Community Right-To-Know Act (EPCRA)**
  **EPCRA 302 Extremely Hazardous Substance**
  No chemical(s) in this material are subject to the reporting requirements of SARA Title III, Section 302.

  **EPCRA 304 Emergency Response Notification**
  No chemical(s) in this material are subject to the reporting requirements of SARA Title III, Section 304.

- **EPCRA311/312 Emergency and Hazardous Materials Reporting**
  **Fire Hazard:** No
  **Sudden Release of Pressure:** No
  **Reactive:** No
  **Acute (Immediate) Health Hazard:** Yes
  **Chronic (Delayed) Health Hazard:** Yes

- **EPCRA 313 Toxic Chemical Release Inventory (TRI) Reporting**
  The following chemical(s) in this material are subject to reporting levels established by SARA Title III, Section 313:
  - n-Methyl Pyrrolidone (CAS# 872-50-4)

**US State Regulations**
- **California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65)**
  This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

*Important Note: Due to the changing nature of regulatory requirements, the information in this document should NOT be considered all-inclusive or authoritative. Users should make their own investigations to determine the suitability of the information for their particular purposes. International, Federal, State and Local regulations should be consulted to determine compliance with all required reporting requirements.*

**Section 16: Other Information**

**Hazardous Materials Identification System (HMIS®) Classification**
- **Health Hazard:** 2
- **Chronic Health Hazard:** *
- **Flammability:** 1
- **Physical Hazard:** 0
  #Hazard Rating: 0 – Minimal / 1 – Slight / 2 – Moderate / 3 – Serious / 4 – Severe

**National Fire Protection Association (NFPA 704) Rating**
- **Health Hazard:** 2
- **Fire Hazard:** 1
- **Reactivity Hazard:** 0
- **Special:** N/A
  #Hazard Rating: 0 – Minimal / 1 – Slight / 2 – Moderate / 3 – Serious / 4 – Severe

Prepared By: Regulatory Manager
Version #: 001
Issue Date: August 19, 2015
Key to Abbreviations and Acronyms

ATE - Acute Toxicity Estimate
BCF - Bioconcentration Factor
EC50 - Effective concentration, 50%
IDHL – Immediately Dangerous to Life and Health
Kg – Kilogram
L – Liter
lb – Pound
LC50 - Lethal Concentration, 50%
LD50 - Lethal Dose, 50%
mg - milligram
ml – milliliter
N/A – Not Applicable
N/D – Not Determined
PEL – Permissible Exposure Limit
REL – Recommended Exposure Limit
STEL – Short-term Exposure Limit
TWA – Time weighted average

ACGIH – American Conference of Industrial Hygienists
AIHA – American Industrial Hygiene Association
BEI – Biological Exposure Indices
CAS – Chemical Abstracts Service
DOT – USD Department of Transportation
EPA – US Environmental Protection Agency
GHS – Globally Harmonized System of Classification and Labelling of Chemicals
IARC – International Agency for Research on Cancer
IATA – International Air Transport Association
IBC – Intermediate Bulk Container
IMDG – International Maritime Dangerous Goods
NIOSH – National Institute for Occupational Safety and Health
NTP – National Toxicology Program
OSHA – US Occupational Health and Safety Administration
SARA – US EPA Superfund Amendments and Reauthorization Act
TSCA – US EPA Toxic Substances Control Act
UN – United Nations

References

HSDB* - Hazardous Substances Data Bank

Disclaimer

The information in this SDS was obtained from sources which we believe are reliable. HOWEVER, THE INFORMATION IS PROVIDED WITHOUT ANY WARRANTY, EXPRESS OR IMPLIED, REGARDING ITS CORRECTNESS. The conditions or methods of handling, storage, use, and disposal of the product are beyond our control and may be beyond our knowledge. FOR THIS AND OTHER REASONS, WE DO NOT ASSUME RESPONSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE HANDLING, STORAGE, USE OR DISPOSAL OF THE PRODUCT. This SDS was prepared and is to be used only for this product. If the product is used as a component in another product, this SDS information may not be applicable.