SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Product Name: 2-methylfuran
Manufacturer’s Name and Address: Penn A Kem. LLC
3324 Chelsea Avenue
Memphis, TN 38108
Synonyms: methylfuran
Stabilized methylfuran

Hazard Information Services**
Chemtrec Emergency Number US: 800 228 5635
800 424 9300
(877) 895 7366

SECTION 2: Composition/Information on Ingredients

CAS NO.: 534-22-5
EINECS/ELINCS: 208-594-5
Chemical Name: 2-methylfuran
Molecular Weight: 82.1
Chemical Formula: C₅H₆O
Percent: 98-100.%

Note: This material may be stabilized with a hindered phenol antioxidant, less than 0.04 wt%.

SECTION 3: Hazards Identification

Emergency Overview: This material is HAZARDOUS by OSHA Communication definition.
Signal Word: Danger.
NFPA Rating: Health: 2; Flammability: 3; Reactivity: 1
NHIS Rating: Health: 2; Flammability: 3; Reactivity: 1
Hazards: Highly flammable. Avoid oxidizing agents. Avoid prolonged or repeated breathing of gases, vapors or mists.
Primary Route of entry: Inhalation
Eye: May be irritating to eye.
Skin: May be irritating to skin.
Ingestion: May cause irritation of the digestive tract.
Inhalation: May cause respiratory tract and mucous membrane irritation. May cause unconsciousness or respiratory arrest.
Chronic: No information available.
Target Organs: No information available.

SECTION 4: First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash skin thoroughly with mild soap and water. Wash clothing before reuse. Get medical aid if ill effects or irritation develops.
Ingestion: Do not induce vomiting. Never give anything by mouth to an unconscious person. If conscious and alert, rinse mouth and drink water. Get medical aid.
Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if breathing difficulty persists.

SECTION 5: Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.
During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Cool containers with flooding quantities of water.

**Extinguishing Media:**
Small fire use water spray, dry chemical, carbon dioxide. Large fire use water spray, water fog dry chemical, carbon dioxide, or alcohol resistant foam. **DO NOT USE SOLID WATER STREAM.**

**Flash Point:**
-22°F, -30°C

**Auto ignition Temperature:**
842°F, 450°C

**Explosion limits, Lower:**
1.9
**Upper:**
14.0
**NFPA Rating:**
Health: 2; Flammability: 3; Reactivity: 1
**NHIS Rating:**
Health: 2; Flammability: 3; Reactivity: 1

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**SECTION 6: Accidental Release Measures**

**General Information:**
Eliminate all sources of ignition. Use proper personal protective equipment as indicated in Section 8.

**Spills/Leaks:**
Absorb spill with inert non-combustible material (e.g. vermiculite, sand or earth), then place in a suitable container. Clean up spills immediately using non-sparking tools. Provide ventilation.

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**SECTION 7: Handling and Storage**

**Handling:**
Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Handle empty containers with care. Vapor/residues may be flammable.

**Storage:**
Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

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**SECTION 8: Exposure Controls, Personal Protection**

**Engineering Controls:**
Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation and exhaust to keep airborne concentrations low.

**Exposure Limits:**

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>2-methylfuran</th>
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<tbody>
<tr>
<td>ACGIH:</td>
<td>Not reported</td>
</tr>
<tr>
<td>OSHA</td>
<td>Not Reported</td>
</tr>
</tbody>
</table>
Material Safety Data Sheet

2-Methylfuran
MSDS Date: 02/1/2011

SECTION 8: Exposure Controls, Personal Protection Cont’d

Personal Protective Equipment:

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles and face shield as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Hands: Wear appropriate protective gloves to prevent skin exposure. Butyl rubber, Viton, or 4H and Silver Shield brand.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

SECTION 9: Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>Liquid</td>
</tr>
<tr>
<td>Appearance</td>
<td>Clear, colorless to yellow to amber.</td>
</tr>
<tr>
<td>Odor</td>
<td>Ether-like odor.</td>
</tr>
<tr>
<td>pH</td>
<td>Not available</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>155 mm Hg @ 25 °C (77 °F)</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>2.84 (calculated)</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>Not available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not available</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>63 °C</td>
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<tr>
<td>Freezing/Melting Point</td>
<td>-89 °C</td>
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<tr>
<td>Autoignition Temperature</td>
<td>842°F, 450°C</td>
</tr>
<tr>
<td>Solubility: water</td>
<td>Insoluble.</td>
</tr>
<tr>
<td>Specific Gravity/Density</td>
<td>0.91 g/cc.</td>
</tr>
<tr>
<td>Molecular Formula</td>
<td>C₅H₆O</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>82.1</td>
</tr>
</tbody>
</table>

SECTION 10: Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, excess heat, strong oxidants.

Incompatibilities with other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Not reported.

SECTION 11: Toxicological Information

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
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<tbody>
<tr>
<td>LD50</td>
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<tr>
<td>LC50</td>
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<tr>
<td>Carcinogenicity</td>
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<tr>
<td>Epidemiology</td>
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<tr>
<td>Sensitization</td>
<td>No information available.</td>
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</tbody>
</table>
Material Safety Data Sheet

Eye
Liquid and vapor is irritating to eyes.

Skin
No information available.

Teratogenicity:
No information available.

Reproductive Effects:
No information available.

Genetic toxicity:
No information available.

Neurotoxicity:
No information available.

Other Studies:
No information available.

SECTION 12: Ecological Information

Acute toxicity fish
No information available.

Invertebrates
No information available.

Aquatic plants
No information available.

Microorganisms
No information available.

Other Studies:
No information available.

SECTION 13: Disposal Considerations

Contaminated products, oil or water may be a US RCRA or OSHA hazardous waste due to a potentially low flash point. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

SECTION 14: Transport Information

<table>
<thead>
<tr>
<th>US DOT</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Shipping Name</td>
<td>2-methylfuran</td>
</tr>
<tr>
<td>Hazard Class</td>
<td>Flammable liquid</td>
</tr>
<tr>
<td>UN Number</td>
<td>UN2301</td>
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<tr>
<td>Packing Group</td>
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</table>

<table>
<thead>
<tr>
<th>International</th>
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<tbody>
<tr>
<td>Shipping Name</td>
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<td>UN2301</td>
</tr>
<tr>
<td>Packing Group</td>
<td>II</td>
</tr>
</tbody>
</table>

SECTION 15: Regulatory Information

US FEDERAL:

TSCA (Toxic Substance Control Act): 2-methylfuran is listed on the TSCA inventory.

TSCA Section 12b: Not listed.

CERLA Hazardous Substances and Corresponding RQs:
SARA Section 302 (Superfund Amendments and Reauthorizations Act):
SARA 311/312 Based on available information, 2-methylfuran is classified as follows: Fire Hazard

313 Reportable Ingredients: None of the chemicals are reportable under Section 313.

Clean Air Act: This material does not contain any Class 1 Ozone depletors, or Class 2 Ozone depletors.

Clean Water Act: None of the chemicals in this product are listed as Hazardous Substances, Priority Pollutants, or Toxic Pollutants under the CWA.

STATE:

California Prop 65: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives:
Hazard Symbols: .
Risk Phrases: R11– Highly Flammable.
Safety Phrases: • S 24/25, Avoid contact with skin and eyes.
• S 33, Take precautionary measures against static discharges.
• S 37, Wear suitable gloves.
• S 45, In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
• S 28A, In case of skin contact, wash immediately with plenty of water.

WGK (Water Danger/Protection):
Canada – DSL/NDSL: This chemical is listed on the DSL/NDSL list.

Canadain Ingredient Disclosure List: None.

SECTION 16: Additional Information

MSDS Creation Date: 01/02/2011
Revision #1 Date: 01/03/2012 added Chemtrec info

The data contained herein is based on information currently available to Penn A Kem LLC, and believed to be factual and the opinions expressed to be those of qualified experts; however, this data is not to be taken as a warranty or representation for which Penn A Kem assumes legal responsibility.