



Furfural

1. Chemical Product and enterprise information

Product Name.....Furfural
Synonyms.....2-furaldehyde,furfuraldehyde,2-Furancarboxyaldehyde
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MSDS No.....HYFURF-061001-05
Effective Date.....October1, 2006

2. Composition/Information on Ingredients

Name	Furfural
Chemical Formula	C ₅ H ₄ O ₂
CAS No.	98-01-1
by Weight	≥98.5



3. Hazards Identification

♀ **Warning!**

Flammable liquid. Causes eye and skin irritation and possible burns. Harmful if inhaled or swallowed. Causes digestive and respiratory tract irritation. Air sensitive. Light sensitive. May cause liver and kidney damage. Possible sensitizer.

♀ **Target Organs:** Kidneys, liver, respiratory system, eyes, nervous system, skin.

♀ **Eye:** May cause irreversible eye injury. Causes eye irritation and possible burns.

♀ **Skin:** May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. May cause photosensitive skin reactions in certain individuals. Effects of contact may be delayed. Causes skin irritation and possible burns. Substance is readily absorbed through the skin.

♀ **Ingestion:** Harmful if swallowed. Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to



respiratory failure. Effects may be delayed 2 to 4 hours.

♀ **Inhalation:** Harmful if inhaled. May cause allergic respiratory reaction. Inhalation may be fatal as a result of spasm, inflammation, edema of the larynx and bronchi, chemical pneumonitis and pulmonary edema. Vapors may cause dizziness or suffocation. Causes irritation of the mucous membrane and upper respiratory tract.

♀ **Chronic:** Prolonged or repeated eye contact may cause conjunctivitis. May cause liver and kidney damage. Repeated exposure may cause sensitization dermatitis. Laboratory experiments have resulted in mutagenic effects. Animal studies have reported the development of tumors.

4. First-Aid Measures

♀ **Eye Contact:**

Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Get medical attention.

♀ **Skin Contact:**

In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

♀ **Serious Skin Contact:**

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

♀ **Inhalation:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

♀ **Serious Inhalation:**

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

♀ **Ingestion:**

If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.





5. Fire and Explosion Data

- ♀ **Flammability of the Product:** Flammable.
- ♀ **Flash Points:** CLOSED CUP: 60°C (140°F). OPEN CUP: 68°C (154.4°F) (Cleveland).
- ♀ **Auto-Ignition Temperature:** 392°C (737.6°F).
- ♀ **Flammable Limits:** LOWER: 2.1% UPPER: 19.3%
- ♀ **Products of Combustion:** These products are carbon oxides (CO, CO₂).
- ♀ **Fire Hazards in Presence of Various Substances:** Flammable in presence of open flames and sparks, of heat.
- ♀ **Explosion Hazards in Presence of Various Substances:**
 - ▶ Risks of explosion of the product in presence of mechanical impact: Not available.
 - ▶ Explosive in presence of open flames and sparks, of heat.
- ♀ **Fire Fighting Media and Instructions:**
 - ▶ Flammable liquid, soluble or dispersed in water.
 - ▶ Small fire: Use DRY chemical powder.
 - ▶ Large fire: Use alcohol foam, water spray or fog. Cool containing vessels with water jet in order to prevent.
 - ▶ pressure build-up, autoignition or explosion.
- ♀ **Special Remarks on Fire Hazards:**
 - ▶ When heated to decomposition it emits acrid smoke and irritating fumes.
 - ▶ Vapor forms flammable mixture with air.
 - ▶ Vapor may travel considerable distance to source of ignition and flash back.
 - ▶ Spontaneous occurs when furfural is mixed with sodium hydrogen carbonate.

6. Accidental Release Measures

- ♀ **Small Spill:**

Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
- ♀ **Large Spill:**

Flammable liquid. Poisonous liquid.

Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed.

7. Handling and Storage

- ♀ **Precautions:**

Keep locked up.. Keep away from heat. Keep away from sources of ignition. Ground all





equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, acids, alkalis.

♀ **Storage:**

Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame). Do not store below 8°C (46.4°F).

8. Exposure Controls/Personal Protection

♀ **Engineering Controls:**

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

♀ **Personal Protection:**

Splash goggles. Lab coat. Gloves.

♀ **Personal Protection in Case of a Large Spill:**

Splash goggles. Full suit, Boots, Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

9. Physical and Chemical Properties

♀ **Physical state and appearance:** Liquid. (Liquid).

♀ **Odor:** Almond-like. (Strong).

♀ **Taste:** distinct caramel.

♀ **Molecular Weight:** 96.09 g/mole.

♀ **Color:** Colorless. Amber.

♀ **pH (1% soln/water):** Not available.

♀ **Boiling Point:** 161.8°C (323.2°F).

♀ **Melting Point:** -38.7°C (-37.7°F).

♀ **Critical Temperature:** 397°C (746.6°F).

♀ **Specific Gravity:** 1.1598 (Water = 1).

♀ **Vapor Pressure:** 0.3 kPa (@ 20°C).

♀ **Vapor Density:** 3.3 (Air = 1).

♀ **Volatility:** Not available.

♀ **Odor Threshold:** 0.078 - 0.4 ppm.

♀ **Water/Oil Dist. Coeff:** The product is more soluble in oil; log(oil/water) = 0.4.

♀ **Dispersion Properties:** See solubility in water, diethyl ether, acetone.





♀ **Solubility:**

- ▶ Soluble in cold water, hot water, diethyl ether, acetone.
- ▶ Soluble in chloroform, petroleum ether, benzene, and ethanol.

10. Stability and Reactivity Data

♀ **Stability:** The product is stable.

♀ **Instability Temperature:** Not available.

♀ **Conditions of Instability:** Excess heat, ignition sources, incompatible materials

♀ **Incompatibility with various substances:** Reactive with oxidizing agents, acids, alkalis.

♀ **Special Remarks on Reactivity:**

- ▶ Light sensitive.
- ▶ Furfural may undergo a violent reaction when in the presence of strong mineral acids, alkalies, or oxidizing materials.
- ▶ It is also incompatible with ammonia, aliphatic amines, and aromatic amines.
- ▶ Many coatings and plastics are attacked by furfural.
- ▶ This material may spontaneously polymerize under certain conditions. Polymerization reactions are usually exothermic (heat releasing). Once initiated, it cannot be stopped until it reaches completion.

♀ **Polymerization:**

This material may spontaneously polymerize under certain conditions. Polymerization reactions are usually exothermic (heat releasing). Once initiated, it cannot be stopped until it reaches completion.

11. Toxicological Information

♀ **Routes of Entry:** Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

♀ **Toxicity to Animals:**

- ▶ Acute oral toxicity (LD50): 65 mg/kg [Rat.].
- ▶ Acute toxicity of the vapor (LC50): 175 ppm 6 hours [Rat.].

♀ **Chronic Effects on Humans:**

May cause damage to the following organs: kidneys, the nervous system, liver, upper respiratory tract, skin, eyes.

♀ **Other Toxic Effects on Humans:**

- ▶ Hazardous in case of skin contact (irritant), of ingestion, of inhalation (lung irritant).
- ▶ Slightly hazardous in case of skin contact (permeator).





12. Ecological Information

♀ **Ecotoxicity:** Ecotoxicity in water (LC50): 37.1 ppm 96 hours [Trout].

♀ **BOD5 and COD:** Not available.

♀ **Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

♀ **Toxicity of the Products of Biodegradation:** The products of degradation are less toxic than the product itself.

13. Disposal Considerations

♀ **Waste Disposal:**

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

14. Transport Information

♀ **Shipping Name:** furfural No information available

♀ **Hazard Class:** 6.1

♀ **UN Number:** UN1199

♀ **Packing group/risk group:** III

15. Rule of Law Information

no information

16. Other Information

The data in this Material Safety Data Sheet is believed to be correct. However, since conditions of use are outside our control it should not taken as a warranty of representation for which Henan Hongye Chemical Co., Ltd. assumes legal responsibility. This information is provided solely for your consideration, investigation, and verification.

