MATERIAL SAFETY DATA SHEET

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product/Chemical Name: Dimethyl carbonate -99.5 PCT

Synonyms: Methyl carbonate

Chemical Formula: $C_3H_6O_3$

Structure Formula:

CAS Number: 616-38-6

General Use: It is a perfect methylating agent, carbonylating agent, methoxylating agent and methylolating agent with active chemical properties. It is an ideal substitute for toxic substances such as phosgene, dimethyl sulphate, and methyl chloraformate.

For information in Europe, call:

0032(0) 14575211

For emergency in China, call:

0086-532-3889090, 3889191

For emergencies in the US, call CHEMTREC:

800-424-9300

For emergencies in Europe, call:

0032(0) 14575299

SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS

CAS #	Chemical Name	DMC content%	EINECS #
616-38-6	Dimethyl carbonate	99.5	210-478-4

Hazard Symbols: F

Risk Phrases: 11

SECTION 3 - HAZARDS IDENTIFICATION

EMERENCY OVERVIEW

Appearance: colorless and transparent liquid. Flash Point: 21.7(open cup) and 16.7(closed cup). Danger! Extremely flammable liquid. The toxicological properties of this material have not been fully investigated. May cause central nervous system depression. Aspiration hazard if swallowed. Can enter lungs and cause damage. May cause irritation.

Target Organs: Central nervous system.

POTENTIAL HEALTH EFFECTS

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated. May cause drowsiness, unconsciousness, and central nervous system depression. Vapors may cause dizziness or suffocation.

Chronic: No information found.

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 immediately.

Skin: Get medical aid. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically

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. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. Use water spray to keep fire-exposed containers cool. Extremely flammable liquid and vapor. Containers may explode in the heat of a fire. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.

Extinguishing Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. Use water spray to cool fire-exposed containers. Water may be ineffective. Do NOT use straight streams of water. For large fires, use dry chemical, carbon dioxide, alcohol-resistant foam, or water spray.

Autoignition Temperature: Not available.

Flash Point: 21.7℃(open cup), 16.7℃(closed cup)

Explosion Limits, lower: 3.8 vol %

Explosion Limits, upper: 21.3 vol %

NFPA Rating: 1 - health, 3 - flammability, 1 - instability

SECTION 6 - ACCIDENTAL RELEASE MEASURES

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Remove all sources of ignition. Use a spark-proof tool. A vapor suppressing foam may be used to reduce vapors. Water spray may reduce vapor but may not prevent ignition in closed spaces.

SECTION 7 - HANDLING AND STORAGE

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Ground and bond containers when transferring material. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Take precautionary measures against static discharges. Keep container tightly closed. Avoid contact with heat, sparks and flame. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION

Engineering Controls: Use adequate general or local explosion-proof ventilation to keep airborne levels to acceptable levels.

EXPOSURE LIMITS

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Dimethyl carbonate	None listed	None listed	None listed

OSHA Vacated PELs:

Dimethyl carbonate: No OSHA Vacated PELs are listed for this chemical.

PERSONAL PROTECTIVE EQUIPMENT

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

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Physical State: transparent liquid

Color: colorless

Odor: Pleasant odor.

Density: 1.073(d_4^{20})

Melting point: 4℃

Boiling point: 90.1℃ (0.1MPa)

Vapor Pressure: 53 mbar 20℃

Vapor Density: 3.1 (air=1)

Evaporation Rate: Not available.
Viscosity: 0.664mPas(20℃)
Refractive index: n_d^{20}=1.3687
Heat of combustion: 3452kcal/kg
Solubility of DMC in water: 12.6 wt%
Solubility of water in DMC: 2.9 wt%
Solubility: slightly soluble in water, able to mixed at any proportion with organic solvent such as alcohol, aether, ketone, etc.
Latent heat of vaporization: 8382KJ/Kmol
Dielectric constant: 3.1 c/v.m
Molecular Formula: $C_3H_6O_3$
Molecular Weight: 90.08

SECTION 10 - STABILITY AND REACTIVITY

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, ignition sources, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents, potassium tert-butoxide.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

SECTION 11 - TOXICOLOGICAL INFORMATION

RTECS#:
CAS# 616-38-6: FG0450000
LD50/LC50:
CAS# 616-38-6: Oral, mouse: LD50 = 6 gm/kg; Oral, rat: LD50 = 13 gm/kg; Skin, rabbit: LD50 = >5 gm/kg.
Carcinogenicity:
Dimethyl carbonate -
Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.
Epidemiology:
No data available.
Teratogenicity:
No data available.
Reproductive Effects:
No data available.
Neurotoxicity:
No data available.
Mutagenicity:
No data available.
Other Studies:
No data available.

SECTION 12 - ECOLOGICAL INFORMATION

SECTION 13 - DISPOSAL CONSIDERATIONS

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. 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.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

SECTION 14 - TRANSPORT INFORMATION

Shipping Name: DIMETHYL CARBONATE

Hazard Class: 3.2

UN Number: UN1161

Packing Group: II

SECTION 15 - REGULATORY INFORMATION

US FEDERAL

TSCA

CAS# 616-38-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 616-38-6: acute, flammable.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

Dimethyl carbonate can be found on the following state right to know lists: New Jersey, Florida, Pennsylvania, Massachusetts.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: F

Risk Phrases:

R 11 Highly flammable.

Safety Phrases:

S 9 Keep container in a well-ventilated place.

S 16 Keep away from sources of ignition - No smoking.

S 29 Do not empty into drains.

S 33 Take precautionary measures against static discharges.

WGK (Water Danger/Protection)

CAS# 616-38-6: 1

Canada

CAS# 616-38-6 is listed on Canada's DSL List.

This product does not have a WHMIS classification.

CAS# 616-38-6 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits

SECTION 16 - ADDITIONAL INFORMATION

MSDS Creation Date: 2002.12.31, **Revision #3 Date:** 2003.06.20

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.