

Number: 029

Section 1. Product and Company Identification

Product name: Dipropylene glycol monomethyl ether
Synonyms: -
Recommended use and Restrictions on use: Solvent
Manufacturer, Importer, or Supplier: Shiny Chemical Industrial Co., Ltd. Address: No.5, Yeong Gong 1 st Rd, Yeong An Dist., Kaohsiung 82841, Taiwan, R.O.C. Telephone: +886-7-8619171 ext. 711~714
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Section 2. Hazards Identification

Classification: 1. Flammable liquids, Category 4
Label elements: Hazard pictograms: - Signal word: Warning Hazard Statements: Combustible liquid Precautionary statements: 1. Do not breathe gas/fumes/vapor/mist. 2. Take off the contaminated clothes. 3. Wear eye protect or face protect equipment.
Other Hazards: -

Section 3. Composition/Information on Ingredients

Pure substance

Chemical Name: Dipropylene glycol monomethyl ether
Synonyms:, 1-(2-Methoxy-2-methylethoxy)-2-propanol, 1,4dimethyl-3,6-dioxa-1-heptanol, Arcosolv DPM, DPGME, Dowanol DPM glycol ether, Glycol ether DPM, Propasol solvent DM, HCAR Solvent 2Im
CAS NO.: 34590-94-8
Weight: 100%

Section 4. First Aid Procedures

Description of first aid measures: • Inhalation: 1. Remove the pollutant sources, or move affected person to breath fresh air. 2. Seek medical attention immediately.
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- Skin contact:
 1. Wash thoroughly with warm water at least 5 minutes until the pollutants cleaned.
 2. If the irritation feeling did not release, wash the affected area again and again.
 3. Seek medical attention immediately.
 4. Clean the pollutant clothes, shoes and paper ornaments before discard or use them again.
- Eye contact:
 1. Hold eye lid open, flush eyes with warm water gently at least 5 minutes until the pollutant cleaned.
 2. If the irritation feeling did not release, wash the affected area again and again.
 3. Seek medical attention immediately.
- Ingestion:
 1. If the patient is going to lose of conscious, unconsciousness, or seizure, do not feed anything orally.
 2. Do not induce vomiting, instructs the patient to drink 240~300 mL water.
 3. If the patient spontaneous vomiting, instruct the patient to bent down to decrease the inhalation risk, also instruct the patient to gargle and keep drink.
 4. Seek medical attention immediately.

The most Important Symptoms and Hazardous Effects: -

Protection for emergency personnel: Apply appropriate personal protective equipment such as class C clothing to conduct first aid in a safety area.

Notes to Physicians: Consider gastric lavage while swallow the chemical material.

Section 5. Firefighting Measures

Suitable extinguishing media: Carbon dioxide, Chemical-resistant powder, alcohol-resistant foam, Polymer foam, water spray or mist.

Special hazards during firefighting: -

Firefighting procedures:

1. The firemen should wear the respirators, chemical resistant clothes and positive pressure self-contain air breathing apparatus (self-contain air breathing apparatus SCBA).
2. Move the container away from the firing place under the safety condition.
3. Cool down the temperature of the vessels, disperse the vapor, and do not use water in the vessels.

Protective equipment for firefighters: -

Section 6. Accidental Release Measures

Personal precautions:

1. Confine members to enter the pollutant area before the area cleaned thoroughly.
2. Make sure the trained people to finish the clean mission.
3. Wear the adequate personal protective equipment.

Environmental precautions:

1. Ventilate the area.
2. Put off or remove all firing sources.
3. Inform the Government's environmental health and safety-related units.

Methods for cleaning up:

1. Do not touch the leakage.
2. Avoid the leakage flowing to the sewer and drainage system or airtight space.
3. Trying to stop or decrease the leakage under the safety circumstance.
4. Absorb leakage substances with sands, dirt or other materials which do not react with the leakage substances and to contain it.
5. Remove the liquid with Hg or vacuum equipment, and store in the well labeled vessel which is sealed closely.
6. A small amount of leakage: Absorb the leakage substance with the materials which do not react with it. The pollutant absorbing materials is as dangerous as the leaking substance; discard them in the covered and labeled vessels. Pour the leakage area with water. The small amount of leakage can be diluted with large amount of water.
7. A large amount of leakage: Contact with the fire bureau, emergency processing units and the supplier for help.

Section 7. Handling and Storage

Handling:

- Advice on safe handling:
1. The chemical substance is flammable and toxic liquid, while handling, start the engineer control and make the best use of personal protective apparatus; the workers should know the danger of the substance and be well trained to use the substance safely.
 2. Remove all ignition sources and keep away from heat and incompatible materials.
 3. Set up the "No Smoking" sign in the working area.
 4. The empty barrels, vessels and pipe line may remain the dangerous residual. Do not precede welding, cutting, drilling or other task which could heat these things mentioned above until they are cleaned.
 5. Avoid making mist or vapor, operating at the well ventilated area and applying

<p>the minimum dose, separating the operation area and storage area.</p> <ol style="list-style-type: none"> Do not use the chemical substance with incompatible materials (such as strong oxidative reagent) to avoid increasing the risk of firing and explosion. Store the chemical substance in the vessels composed of compatible substances, be careful not to spill out while packaging. Do not pour the contaminated liquid back to the vessels. Label the vessels, and keep them well sealed which will not be damaged.
<p>Storage:</p> <ul style="list-style-type: none"> Requirements for storage areas and containers: <ol style="list-style-type: none"> Stored at the cool, dry, well ventilation and free of direct sunlight, keep away from heating source, firing source and incompatible substances. Storage area should be separated from the working area; keep away from the lift, building, room entrance or the main storage avenue. Around the storage area should set the adequate fire-extinguish devices and leakage processing devices. Examine the new vessels are well labeled and not broken. The empty barrel may have hazardous residual, keep them sealed closely and keep them away from the storage area. Follow the chemical manufacture or supplier's instruction to store at the right temperature. If necessary, install the temperature detection warning devices to detect the temperature. The storage tank should be built on the ground, and the base should be blocked in case of leakage. Build the anti-liquid embankment around the tank to contain the entire capacity of leakage.

Section 8. Exposure controls

Engineering controls:			
<ol style="list-style-type: none"> General (dilution) ventilation system. If some mist produced in heating procession, take advantage of ventilation system. Provide fresh air to complement the air expelled by the exhaust system. 			
Control parameters			
TWA	STEL	CEILING	BEIs
100 ppm (skin)	125 ppm (skin)	-	-
Personal protective equipment:			
<ul style="list-style-type: none"> Respiratory protection: <ol style="list-style-type: none"> Below 600 ppm: Ventilation type of respiratory protective apparatus (SAR), Air respirator (self-contain breathing protection apparatus SCBA). Unknown concentration or IDLH: Positive pressure self-contain air breathing 			

apparatus (self-contain breathing protection apparatus, SCBA). 3. Use together with positive pressure full face type of self-contain air breathing apparatus and Auxiliary type of positive pressure breathing apparatus (self-contain breathing protection apparatus SCBA). 4. Life Saving: Gas mask with organic vapor filter, Life-saving type self-contain breathing apparatus. (Self Contain Breathing Apparatus, SCBA). <ul style="list-style-type: none"> • Hand protection: Anti-leaking glove: Butyl rubber is better (durable more than 8 hours), the second choice is Chloroprene rubber (durable for more than 4 hours). • Eye protection: Chemical anti-spam spectacle. • Skin and physical protection: -
Hygiene measures: 1. Taking off the clothes of pollution quickly after finishing the work, do not dress or abandon before cleaning, and the laundry must be informed the danger of the pollutants. 2. Forbid smoking or diet in the workplace. 3. After dealing with the material, washing hands thoroughly. 4. Keep the working place clean.

Section 9. Physical and Chemical Properties

Appearance: Colorless liquids	Odor: Light ether taste, slightly eye irritant
Odor threshold: 35 ppm	Melting point: -83°C
pH: -	Boiling point/Boiling range: 190°C
Flammability (solid, gas): -	Flash point: 86°C
Decomposition temperature: -	Test method: close cup
Auto-ignition temperature: -	Explosion limits: 1.1% ~ 3.0% (200°C)
Vapor pressure: 0.38 mmHg (25°C)	Vapor density: 5.11 (air=1)
Density: 0.949 (water=1)	Solubility: Entirely water-soluble
Partition coefficient (log K _{ow}): -	Volatility rate: 0.02 (Butyl acetate=1)

Section 10. Stability and Reactivity

Chemical stability: Stable in normal environment
Possibility of hazardous reactions: Contact to strong Oxidants will increase the risk of fire explosion.
Conditions to avoid: Air, sunlight, temperature higher than 86°C.
Materials to avoid: Strong Oxidants
Hazardous decomposition products: -

Section 11. Toxicological Information

Exposure Route: Skin, inhalation, ingestion, eye
Symptoms: Irritation to nose and throat, headache, nausea, dizzy, drowsiness, motion uncoordinated, unconsciousness.
<p>Acute toxicity:</p> <ul style="list-style-type: none"> • Inhalation: <ol style="list-style-type: none"> 1. High concentration of vapor and mist drops may cause the irritation of nose and throat; if exposed to the concentration over 100 ppm, the affected person will feel unpleasant and irritation. The threshold of human irritation is 74 ppm. 2. The vapor concentration is impossible to be over 500 ppm unless the mist drops formed; the concentration which can influence central nervous system is over 1,000 ppm, the classical adverse effect includes: headache, nausea, dizzy, drowsiness, motion uncoordinated, unconsciousness. • Skin: <ol style="list-style-type: none"> 1. Long term exposed to the undiluted solution will not have the irritation feeling. 2. Skin absorption is one of the pathways, if exposed to the chemical substance for a long time or wide area; the symptoms may be similar to inhale. • Eyes: <ol style="list-style-type: none"> 1. Highly concentration of vapor and mist drops will cause slightly and temporarily irritation. • Ingestion: <ol style="list-style-type: none"> 1. In animal model, the toxicity of DPGHE is low. In common use, it is impossible to swallow too much to induce the toxicity. 2. Swallow large doses may affect the central nervous system, and cause the similar symptoms as inhalation. • LD₅₀ (animal test, entry): 5.22 mg/kg (rat, swallow) • LC₅₀ (animal test, entry): - • 500 mg/24 hour(s): induce slightly irritation (rabbit, eyes)
Chronic/Long-term toxicity: -

Section 12. Ecological Information

<p>Ecological toxicity:</p> <ol style="list-style-type: none"> 1. LC₅₀ (fish): - 2. EC₅₀ (aquatic invertebrates): - 3. Bioconcentration factor (BCF): -
<p>Persistence and degradability:</p> <ul style="list-style-type: none"> • BOD (5 and 20 days) of absorbing DPGME is 0% and 31%, it shows it's degrade duration needs a domestication period. • DPGME is mainly decomposed by biodegrade in water, photolysis, hydrolysis and evaporation is not important.

- Its half-life in air is about 3.4 hours, except for photolysis; it can also be removed by rain washed.
- Half-life (Air): -
- Half-life (Water surface): -
- Half-life (Groundwater): -
- Half-life (Soil): -

Bioaccumulative potential: -

Mobility in soil: DPGME is easy to infiltrate to groundwater with it is highly mobility in soil. DPGME can be biodegraded in wet soil, or be evaporated in the dry soil surface.

Other adverse effects: -

Section 13. Disposal Considerations

Waste disposal:

1. Consult the relevant regulation to deal with.
2. Deal with the waste according to the storage conditions.
3. Adopt specific incineration or sanitary landfills methods to deal with.

Section 14. Transport Information

United Nations Number (UN No.): -

UN Proper Shipping Name: -

Transport Hazard classes: -

Packaging Group: -

Marine pollutant (Yes/No): No

Specific Transport Measures and Precautionary Conditions: -

Section 15. Regulatory Information

Applicable Regulations:

1. Occupational Safety and Health Act
2. Regulations for the Labeling and Hazard Communication of Hazardous Chemicals
3. Ordinance on Prevention of Organic Solvent Poisoning
4. Standards of Permissible Exposure Limits of Airborne Hazardous Substances in Workplace
5. Rules on Road Traffic Safety
6. Methods and Facilities Standards for the Storage, Clearance and Disposal of Industrial Waste
7. Public Hazardous Substances & Flammable Pressurized Gases Establishment Standards & Safety Control Regulations

Section 16. Other Information

References	1. CHEMINFO Database, CCINFO CD, 2005-3 2. RTECS Database, TOMES PLUS CD, Vol.65, 2005 3. HSDB Database, TOMES PLUS CD, Vol.65, 2005 4. ChemWatch Database, 2005-1
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Notes	The symbol " - " in this sheet indicates no available information; the symbol " / " indicates the information is not applicable to the substance.