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Section 4 - First Aid Measures

The First-aid Information :

■ Inhalation :

1. Move the patient to an air-circulated place.
2. If the person is not breathing give Artificial Respiration immediately.
3. Seek medical attention immediately

■ Skin Contact :

1. Remove the contaminated clothes and shoes. Immediately wash the injured skin with water and shop above 15 minutes.
2. If necessary, seek medical attention immediately.
3. Clean and dry the contaminated clothes and shoes before reused.

■ Eye Contact :

1. Immediately flush the contaminated eyes with water above 15 minutes.
2. Seek medical attention immediately

■ Ingestion :

1. Immediately contact with local hazard center or physician.
2. If the patient is lost of consciousness, don't induce vomiting or given any liquids.
3. If patient vomit, lower the head below the hip to prevent inhalation of the vomit.
4. If the patient is lost of consciousness, move the head sideward.
5. Seek medical attention immediately

The Most Important Symptoms and Hazardous Effects : Irritation of the respiratory tract, skin, eyes.

Protection of First-aiders : Wear category C protective equipments to practice the first aid in the safety area.

Notes to a Physician : While swallowed, give gastric lavage and active carbon syrup.

Section 5 - Fire Fighting Measures

Extinguishing Media :

1. Anti-alcoholic foam, CO₂, Chemical powder, water spray
2. Big fire, use anti-alcoholic foam or water spray to put out a fire

Specific Hazards when Fire-fight :

1. If fire accident happens, it is ranked to the Medium fire hazard.
2. The temperature of the vapor/air mixes higher than the flash point and may cause explosion.
3. Vapor is heavier than air may spread far. Once the substance meet the source of fire, may cause tempering.

Specific Fire-fighting Procedure :

1. If safe to do so, move the undamaged containers from fire area.
2. Cool tanks or containers with water spray, till the fire is extinguished.
3. Away from the end of the storage.
4. Large fire in storage area, use unmanned operating spray controller or self swinging fire water monitor. If not working, to the following measures: Isolate the danger area, and no entry for non-related personnel. Try to evacuate from the fire area and let the fire burn out.
5. Evacuate immediately if the alarm of the Safety valve starts or changes colors due to fire.
6. Storage tank, delivery track or slot car, evacuate to 800m radius far.

Specific Protection of Firefighters : Fireman must wear full chemical protective clothing and



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self-contained breathing apparatus (SCBA). (wear aluminum mirage protecting coat if necessary)

Section 6 - Accidental Release Measures

Personal Precautions :

1. Restrict access the area until completion of clean up.
2. Ensure clean up is conducted by trained personnel only.
3. Wear proper personal protective equipments.
4. Evacuate the downwind personnel.

Environmental Precautions :

1. Process aeration in the area
2. Prevent entry into sewers.

Methods for Cleaning up :

1. If safe to do so, try to stop spilling.
2. Use water spray to lower down the vapor.
3. Small spill: Use the soil, dry sand or other non-combustible material to absorb the leakage.
4. Large spill: After the embanking surrounds, waste disposal manage.
5. Release into the water: Away from the water source and sewer.

Section 7 - Handling and Storage

Handling :

1. Avoid personal contact, include inhalation.
2. If under exposure, wear personal protective clothing.
3. Manage in the well ventilated place.
4. Avoid accumulation in the basin and cesspool.
5. Don't enter to the limited space.
6. Avoid smoking, exposing in the naked fire or ignition.
7. Avoid contact incompatible material.
8. No drinking, eating or smoking during operation.
9. Keep container closed if not using.
10. Avoid physical damage of the container
11. Wash hand with soap after manage is a must.
12. Working cloth should laundry separately.
13. Keep good occupational working habits.
14. Detecting the quality of the air regularly to make sure the safety of the working environment.
15. Avoid absorbing the chemical by the cloths and so to skin contact.

Storage :

1. Use glass container, metal container or drum to store.
2. Checking the containers and see if they are properly label and without leakage.
3. Avoid reacting with oxidizer.
4. Store in the original container.
5. Keep the container sealed if not use.
6. No smoking, exposing in the naked fire or ignition.
7. Store in a cool, dry, well ventilated place.
8. Away from incompatibles and food containers.
9. Avoid physical damage of the container and leak detecting regularly.



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Section 8 - Exposure Controls & Personal Protection

Engineering measures :			
1. Entirely aeration or locally exhausted device.			
2. Set up emergency shower equipment.			
Control parameters			
TWA	STEL	Ceiling	Biological standards
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Personal protective equipment :			
<ul style="list-style-type: none"> ■ Respiratory Protection : <ol style="list-style-type: none"> 1. If repeated overexposure, appropriate personal respiratory protective equipment is highly recommended. 2. Different equipments are required when exposure in different concentration. 3. Confirm the warning notice before using. 4. Use any anti-dust, mist or smoke filtering material respirator. Any high efficiency grain filtering material made air filter respirator. Any dynamic air filter respirator with dust, mist and smoke proof. Any dynamic air filter respirator with high efficiency grain filtering material made. 5. Unknown concentration or under condition of endanger to healthy and life: Wear any NIOSH approved full-face piece self-contained breathing apparatus and positive pressure demand. ■ Hand Protection : Wear chemical protective gloves. ■ Eye Protection : <ol style="list-style-type: none"> 1. Splash protective goggles 2. Face shield 3. Provide the emergency eye washing equipments or speedily shower equipments. ■ Skin and Body Protection : Chemical protective clothing which is made by Butyl rubber. 			
Hygiene measures :			
1. Remove contaminated clothes, clean thoroughly before reuse or disposal. Must advise the danger to the laundry worker.			
2. Smoking, eating and drinking are prohibited in work area.			
3. Wash hands thoroughly after handling this substance.			
4. Maintain a clean work environment.			

Section 9 - Physical & Chemical Properties

Appearance : colorless to yellowish liquid	Odor : fish smell
Color : Transparent	Melting Point: -24 ~ -23 °C
pH value : 7.7-8.0 (10 % solution)	Boiling point/boiling range : 202-204 °C
Flammability: --	Flash point : 86 °C
Decomposition temp : --	Test method : closed cup
Auto ignition temp : 346 °C	Explosion properties : 1.3 % ~ 9.5 %
Vapor pressure : 0.29 mmHg @ 20 °C	Vapor density : 3.4 (air=1)
Density : 1.026-1.033 (water=1)	Solubility : Solved together with water. Be solved in acetone, ethers.



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log Kow : --	Evaporation Rate : 0.06 (butyl acetate =1)
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Section 10 - Stability & Reactivity Data

Stability : Stable under normal temperatures and pressures.
Possible hazardous reactions under specific conditions : 1. Acid: incompatible 2. Oxidizers (strong) - Fire and explosion hazard.
Conditions to avoid : 1. Avoid contact with heat, sparks, flames, or other sources of ignition. 2. May cause break or explosion of the container while under exposure of the heating.
Materials to avoid : Aacid, oxidizers.
Hazardous decomposition products : Thermal decomposition products may include Carbon oxides, nitrogen oxides

Section 11 - Toxicological Information

Route of exposure : Skin, inhalation, ingestion, eyes
Symptoms : Coughing, headache, Dizziness, mental disorder, nausea, skin irritation, eye irritation burning feel of the eye, pain on eye and eye lid, tearing, inflammation of the conjunctivae, Transient Corneal blurring, gastrointestinal tract irritation.
Immediate Toxicity : 1. Skin : 1.1 Cause mild irritation while contacting. 1.2 May be absorbed to the invivo from skin. 2. Inhalation : 2.1 Exposure to very high concentrations may cause coughing, headache, dizziness, mental disorder, nausea. 2.2 Under the condition of inhale concentration of 180-200 mg/m ³ and inhale saturated vapor for 6 hours, doesn't not cause death of mouse and rat. 3. Eye : 3.1 Exposure with vapor may cause irritation. 3.2 Direct contact may cause burning pain, eye and eyelid irritation tearing, inflammation of the conjunctivae, transient corneal blurring, gastrointestinal inappropriate. 4. Ingestion : Causes gastrointestinal tract irritation. ● LD ₅₀ : 3914 mg/kg (rat, oral) , 8 gm/kg (rabbit, skin) ● LC ₅₀ : --
Specific effects : 1. Long term exposure to very high concentrations may cause Coughing, headache, Dizziness, mental disorder, nausea. 2. Found in the occupational expose, a 23 year-old pregnant technician was presenting the stillbirth in the initial pregnancy. 3. In animal studies, repeated exposure of 50 ppm 8 hours daily for 20days or 370ppm 6 hours daily for 10days result no abnormality in the tissue pathology. 4. Repeated or long term exposure may cause inflammation of the conjunctivae. 5. In the 90 days animal ingestion studies, highest dose to 1% didn't cause any toxicology effect.



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6. Repeated dose of 2500ppm to small mouse for 3 months cause absolute and increase the average of the weight of the liver.
7. Exposure under 7500ppm and 1800ppm dose cause nervous behavioral change in big mouse.
8. From the studies, expose to very high concentrations cause embryonic toxicity of the big mouse and small mouse.

Section 12 - Ecological Information

Ecotoxicology :
■ LC ₅₀ (fish) : --
■ EC ₅₀ (Aquatic Invertebrates) : --
■ Bioconcentration factor (BCF) : 0.23 (approx.)
Persistence and degradability :
1. If release to soil, evaporation from soil surface is not expected to be an important flow mechanism. The half life of the clay, loam, and sand are 4.0, 8.7 and 11.5 days.
2. If released into water, NMP is not absorbing to suspended solids and sediment based. Volatilization from water surface is not expected to be an important flow mechanism. Because lack of hydrolysis based, NMP is not expected to process hydrolysis function.
3. If released into air, NMP will present as vapor in the hemisphere. The vapor will react with hydroxyl radical, the product of Photochemistry. Half-life is about 5 hours.
■ Half-Life (Air) : --
■ Half-Life (Water surface) : --
■ Half-Life (Groundwater) : --
■ Half-Life (Soil) : --
Bioaccumulative potential : Low aquatic organisms of bioconcentration is expected
Mobility in soil : Very high mobility in the soil is expected.
Other adverse effects : --

Section 13 - Disposal Considerations

Methods of disposal :
1. Refer to the related regulation
2. Recycle any unused portion of the material for its approved use or return it to the manufacturer or supplier.
3. Bury the disposal waste in the certified landfill or incinerate in the approved incineration furnace.
4. If possible, recycle the containers or dispose in the certified landfill.

Section 14 - MSDS Transport Information

UN classification number : --
Proper D.O.T Shipping Name : --
Hazard Class : --
Packing Group : --
Marine pollution : --
Specific precautionary transport measures and conditions : --



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Section 15 - Regulatory Information

Regulations :
1. Regulations for Labor Safety and Health Installations
2. Regulations for Chemical Hazard Communication
3. Industrial Waste Storage and Disposal Regulations and Facility Standards
4. Public Hazardous Materials and Flammable Pressurized Gases Establishment Standards and Safety Control Regulations

Section 16 - Other Information

Literature references	1. RTECS Database , TOMES CPS Disc , Vol.71 , 2007		
	2. ChemWatch Database , 2007-1		
	3. OHS MSDS Database , 2007		
	4. HSDB Database , TOMES CPS Disc , Vol.71 , 2007		
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