


SAFTY DATA SHEET

I .CHEMICAL PRODUCT AND COMPANY IDENTIFACTION

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| Product Name : Butyraldehyde |
| Other name : |
| Suggested application and limitation : catalyst of rubber synthesizing |
| Manufacturer/Supplier/address : FORMOSA PLASTIC CORPORATION/ Formosa Industrial Park Mailiao Township, Yunlin Country 23-1 |
| Emergency Telephone/FAX : +886-5-6811095 / +886-5-6811530 |

II . IDENTIFACATION OF MATERIAL

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| Hazards Classification : flammable liquid class 2 、acute toxin class 5 (swallow) 、skin irritation material class 2 、sever eye irritation material class 2A 、inhalation hazards class 2 、specific organ system toxin ~single exposure class 3 |
| Warning mark : flame 、exclamation mark 、health hazard  |
| Warning description : DANGEROUS |
| Hazard warning information : Highly Flammable liquid and vapor May be harmful if swallowed Causes skin irritation Severe eye irritation May be harmful if inhaled Causes respiratory tract irritation |
| Hazard preventing measure : Close the container tightly Store in dry ,well-ventilate place Away from fire, No smoking! Wear proper protective clothing Do not vomit |
| Other Hazard : - |

III . IDETIFACTION OF MATERIAL

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| Product Name : Butyraldehyde |
| Synonym : Butal 、 Butaldehyde 、 Butalyde 、 Butanal 、 Butyral 、 n-Butyl aldehyde 、 Butyraldehyde 、 Butanaldehyde 、 Butyl aldehyde 、 Butyric aldehyde |
| CAS No. : 123-72-8 |
| Weight (%) : > 99% |

IV . FIRST AID

With different exposure ways:

Inhalation : **1.**Place unconscious person on the side in recovery position ◦ **2.**If respiratory problems ,artificial respiration/oxygen **3.**Get medical attention immediately ◦

Skin contact : **1.** Immediately remove contaminated clothing. Wash contaminated skin with water and soap over 15 minutes. **2.** Get medical attention immediately. **3.**Clean contaminated clothes before using them ◦
4.Destory contaminated shoes

Eye contact : **1.**Wash eyes with plenty of water over 15 minutes ◦ **2.** Get medical attention immediately

Ingestion : **1.**If ingestion ,do not vomit ◦ **2.** Get medical attention immediately

Symptom and health effect : Respiratory irritation 、Skin irritation 、Eye irritation 、Central nervous inhibition.

Protection of first-aid personnel : Wear protection equipment class C.

Hint for doctor : If inhalation, consider artificial oxygen. If ingestion, avoid vomiting or gastric lavage

V . Fire extinguish measures

Suitable fire-extinguishing chemical :

1.Aniti- alcohol foam 、Chemical powder 、Carbon dioxide 、Water spray ◦

2.If conflagration occurs ,using anti-alcohol foam or water spray.

Potential hazard :

1.Severe conflagration ◦ **2.**Higher vapor density then air and may travel considerable distance to source of ignition and flash back.**3.**Form explosive mixture with air.

Specific fire extinguishing step :

1.Remove container under safe situation **2.**Cooldown with water spray until the fire extinguished.**3.** Stay away from the container ◦ **4.** Confalgreation in storage area, use unmanned water spray or auto-fire aim to cool down the container until the fire put out. If it is not possible to extinguish the fire, separate the area and allow the fire burned out. ◦ **5.**Evacuate the area immediately when alarming **6.**Evacuaing radius :800m **7.**Do not try to extinguish before the chemical leaking stop. **8.**Extinguish fire with water spray ◦ **9.**Do not use high pressure water flow **10.** Stay leeward, leave low lying place **11.**Avoid any inhalation. **12.**It may be ineffective to put out the fire with water

Specific protective equipment for firefighter : Wear self-contained breathing apparatus and protective clothing.

VI . Accidental release measures

Personal precautions : **1.**Evacuate the area . ◦ **2.** Stay leeward, leave low lying place

Environmental precautions :**1.**Avoid heat 、flame 、spark and other source of ignition ◦ **2.** Remove source of ignition

Method of clean up : **1.**Try to stop leaking under safe situation. **2.**Dilute vapor with water spray ◦ **3.** Small amount of leaking: Cover with sand, dry lime, or soda ash then place in proper container

VII 、 Handling and storage

Handling : **1.** Avoid contact, including inhalation . **2.** Wear self-contained breathing apparatus , under vapor exposure. **3.** Handling in well-ventilate place. **4.** Do not enter unventilated space without air monitoring. **5.** No smoking or exposing under ignition source. **6.** No food or smoking ◦ **7.** Do not use plastic container. **8 . All metal container should be ground connected while decant the material.** **9.** Use anti-spark tools. **10.** Keep container close tightly. **11.** Avoid physical damage of the container. **12.** Make sure to wash hands with water and soap after handling ◦ **13.** Monitoring the air condition periodical.

Storage : **1. Check the safety label and make sure no leaking.** **2.** Avoid reacting with oxidant 、 base 、 acid or strong reducing agent. ◦ **3.** Avoid contact with strong acid. **4.** Storage in the original container ◦ **5.** Keep container closed ◦ **6.** Storage in cool, dry and in well-ventilate place. **7.** Avoid physical damage and check leaking periodical. **8.** Storage temperature: **10-25°C** **9.** Do not use mild steel or zinc container.

VIII 、 Exposure controls

Engineering controls : **1.** Offer mechanical exhaust or fixed the material in process. ◦ **2.** If the concentration is over explosion limit, use explosion-proof mechanical exhaust.

Personal protection equipment :

Respiratory protection : Government approved respirator.

Hand protection : **1.** Chemical protection gloves ◦

Eye protection : **1.** Chemical Safety goggles ◦ **2.** MASK ◦ **3.** Emergency eye washing equipment or fast shower equipment ◦

Skin and body protection : **1.** Chemical protecting garment ◦

九 、 Physical and chemical property

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| Physical state : colorless liquid | Odor : Obvious |
| Olfactory threshold : - | Melting point : -96°C |
| pH : - | Boiling point / range : 75-76°C |
| inflammability : - | Flash point : -22°C |
| Decompose temp. : - | Test method : closed cup |
| Auto ignition temp : 218°C | Explosion limit : 1.9%~12.5% |
| Vapor pressure : 91.5mmHg@20°C | Vapor density : 2.5 (Air=1) |
| Density : 0.817 (Water=1) | Solubility in water : 7% , Soluble in ethanol 、 ether 、 acetone 、 benzene 、 toluene |
| Log octanol-water partition : - | Evaporate speed : - |

十 、 Stability and reactivity

Stability : Stable under normal temperature and pressure

Hazard under specific situation : **1.** Base : no reaction ◦

2. Oxidant(strong) : Cause explosion ◦

3. Chlorosulfuric acid 、 Nitric acid 、 sulfuric acid 、 Fuming sulfuric acid :
Rising temperature and pressure ◦

Situation should be avoid : **1.** Heat 、 flame 、 spark and other source of ignition **2.** Container may break or explode under exposure of heat source' .

Material should be avoid : Oxidant 、 Acid 、 Base ◦

Hazardous decomposition product : Produce carbon oxide(COx) under heat decomposition

十一、Toxicological information

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| Route of exposure : Skin contact 、inhalation 、ingestion、eye contact |
| Symptoms : Inhalation : 1. May be irritating to mucous membranes and upper respiratory tract Skin contact : Cause skin irritation Eye contact : Cause eye irritation ingestion : Harmful if swallowed LD₅₀ (animal、process) : 2490 mg/kg (mouse、ingestion) LD₅₀ (animal、process) : 3560 μl/kg (rabbit、skin) LC₅₀ (animal、process) : 6400 ppm/4H (mouse、inhalation) 410 mg (rabbit、skin) light irritation 20 mg/24H (rabbit、eye) moderate irritation |

XII、Ecological information

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| Environmental toxicity : LC₅₀ (fish) : 16000 μg/L/96 H (<i>Pimephales promelas</i>) EC₅₀ : — BCF : 3 (estimation) |
| Environmental fate : 1. Release into soil, this material is expected evaporate from the surface of soil. 2. Release into water, this material is expected to quickly evaporate. The half-life time in river is 5.2hour and lake is 5.3 days. 3. When releases into air, this material exist in vapor phase, and expected to be degraded by reacting with photochemically produced hydroxyl radicals and the half-life is about 16.4 hour. |
| Bio-accumulate : Expected low bio-accumulate in water ° |
| Mobility in soil : Expected high mobility in soil |
| Other effect : — |

XIII、Disposal considerations

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| Substance disposal : 1. Dispose with suitable legislation 2. Contact a licensed professional waste disposal service to dispose this material 3. Burn the waste in proper place. 4. Recycle the container if possible. ° |
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XIV、Transport information

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| UN# : 1129 |
| UN shipping name : Butyraldehyd |
| Transportation hazard classification : Class 3 |
| Package classification : II |

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| Severe marine pollution (Yes/No) : No |
| Special transportation method : - |

XV、Legislation Information

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| Suitable legislation : | |
| <ol style="list-style-type: none"> 1. Regulation of Labelling and Hazard Communication of Dangerous and Harmful Materials 2. Methods and Facilities Standards for the Storage, Clearance and Disposal of Industrial Waste 3. Public Hazardous Substances & Flammable Pressurized Gases Establishment Standards & Safety Control Regulations 4. Other ROC relative laws | |
| Reference | <ol style="list-style-type: none"> 1. RTECS DATA Base , TOMES CPS Disk , Vol. 71 , 2007 2. ChemWatch DATA Base , 2007-1 3. OHS MSDS DATA Base , 2007 4. HSDB DATA Base , TOMES CPS Disk , Vol. 71 , 2007 5. ROC OSHA GHS website |
| Department of compiler | Name : FORMOSA PLASTIC CORPORATION NBA Department Address /telephone : Formosa Industrial Park Mailiao Township, Yunlin Country 23-1 / 05-6811095 / 05-6811535 |
| Compiler | Title : Engineer Name (Signature) : LAI CHUN CHOU |
| Date | 103. 12. 01 |
| Note | " - " means nodata , " / " means not proper for this material . |