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SIGMA-ALDRICH

Material Safety Data Sheet

 Date Printed: 03/09/2005
 Date Updated: 03/11/2004
 Version 1.70

Section 1 - Product and Company Information

Product Name	Butyraldehyde, dry, 99%
Product Number	538191
Brand	Aldrich Chemical
Company	Sigma-Aldrich
Street Address	3050 Spruce Street
City, State, Zip, Country	SAINT LOUIS, MO 63103 US
Technical Phone:	314 771 5765
Fax:	800 325 5052
Emergency Phone: 414 273 3850 Ext. 5996	

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313	EC no	Annex I Index Number
BUTYRALDEHYDE	123-72-8	Yes	204-646-6	605-006-00-2
Formula	C4H8O			
Synonyms	Aldehyde butyrique (French), Aldeide butirrica (Italian), Bulal, Butaldehyde, Butalyde, Butanal, n-Butanal (Czech), Butanaldehyde, Butyl aldehyde, n-Butyl aldehyde, Bulyral, Butyraldehyd (German), n-Butyraldehyde, Butyric aldehyde, NCI-C56291			

Section 3 - Hazards Identification

Emergency Overview
 Flammable (USA) Highly Flammable (EU). Irritant.
 Irritating to eyes, respiratory system and skin.

HMIS Rating
 Health: 2 Flammability: 3 Reactivity: 1

NFPA Rating
 Health: 2 Flammability: 3 Reactivity: 1

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

Oral Exposure
 If swallowed, wash out mouth with water provided person is conscious. Call a physician.

Inhalation Exposure
 If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

Dermal Exposure
 In case of contact, immediately wash skin with soap and copious amounts of water.

Eye Exposure
 In case of contact, immediately flush eyes with copious amounts of water for at least 15 minutes.

Section 5 - Fire Fighting Measures

Flammable Hazards: Yes

Peroxide Former: Yes

Explosion Hazards

Vapor may travel considerable distance to source of ignition and flash back.
 Container explosion may occur under fire conditions.
 Forms explosive mixtures in air.

Flash Point: 23 °F -5 °C

Explosion Limits: Lower: 2 % Upper: 11.8 %

Autoignition Temp: 199 °C **Flammability:** Yes

Extinguishing Media
Suitable
 Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

Firefighting

Protective Equipment
 Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Specific Hazard(s)
 Flammable liquid. Emits toxic fumes under fire conditions.

Specific Method(s) of Fire Fighting
 Use water spray to cool fire-exposed containers.

Section 6 - Accidental Release Measures

Procedure to be Followed in Case of Leak or Spill
 Evacuate area. Shut off all sources of ignition.

Procedure(s) of Personal Precaution(s)
 Wear respirator, chemical safety goggles, rubber boots, and heavy rubber gloves.

Methods for Cleaning Up
 Cover with dry-lime, sand, or soda ash. Place in covered containers using non-sparking tools and transport outdoors. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

Handling
User Exposure
 Avoid breathing vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

Storage
Suitable
 Keep container closed. Keep away from heat, sparks, and open flame.

Special Requirements
 Stench. Do not distill to dryness.

Section 8 - Exposure Controls / PPE

Engineering Controls
 Safety shower and eye bath. Use nonsparking tools. Mechanical exhaust required.

Personal Protective Equipment
Respiratory
 Government approved respirator.

Hand
Compatible chemical-resistant gloves.
Eye
Chemical safety goggles.

General Hygiene Measures
Wash thoroughly after handling. Wash contaminated clothing before reuse.

Section 9 - Physical/Chemical Properties

Appearance	Physical State	Color	
	Clear liquid	Colorless	
Molecular Weight:	72.11 AMU		
pH	6 - 7	20 °C	Concentration: 71 g/l
BP/BP Range	74 - 75 °C		
MP/MP Range	-96 °C		
Freezing Point	N/A		
Vapor Pressure	80 mmHg	20 °C	
Vapor Density	2.5 g/l		
Saturated Vapor Conc.	N/A		
SG/Density	0.805 g/cm ³		
Bulk Density	N/A		
Odor Threshold	N/A		
Volatile%	N/A		
VOC Content	N/A		
Water Content	N/A		
Solvent Content	N/A		
Evaporation Rate	N/A		
Viscosity	0.43 Pas	20 °C	
Surface Tension	29.9 mN/m	24 °C	
Partition Coefficient	Log Kow: 0.79		
Decomposition Temp.	N/A		
Flash Point °F	23 °F		
Flash Point °C	-5 °C		
Explosion Limits	Lower: 2 % 1.8 % Upper: 11.8 % 8.0 %		
Flammability	N/A		
Autoignition Temp	199 °C		
Refractive Index	1.38		
Solubility			
Solubility in Water:	Soluble.		
Other Solvents:	SOLUBLE IN ETHANOL, ETHER, ETHYL ACETATE, ACETONE, TOLUENE, BENZENE.		

N/A = not available

Section 10 - Stability and Reactivity

Stability
Conditions of Instability
Protect from light.
Reactions to Avoid
Do not distill to dryness.
Conditions to Avoid
Normally stable; however, on long term storage, materials containing similar functional groups form peroxides of unknown stability.
Protect from heat.

Materials to Avoid
Oxidizing agents, Strong bases, Strong reducing agents, Strong acids.

Hazardous Decomposition Products
Hazardous Decomposition Products
Carbon monoxide, Carbon dioxide.

Hazardous Polymerization
Hazardous Polymerization
May undergo autopolymerization.

Section 11 - Toxicological Information

Route of Exposure
Skin Contact
Causes skin irritation.

Skin Absorption
May be harmful if absorbed through the skin.

Eye Contact
Causes eye irritation.

Inhalation
May be harmful if inhaled. Material is irritating to mucous membranes and upper respiratory tract.

Ingestion
May be harmful if swallowed.

Signs and Symptoms of Exposure

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

RTECS Number: ES2275000

Toxicity Data

Skin - Rabbit: 3,560 mg/kg(LD50)

Intraperitoneal - Rat: 800 MG/KG (LD50)

Subcutaneous - Rat: 10 GM/KG (LD50)

Remarks: Behavioral:General anesthetic.

Inhalation - Mouse: 44,610 mg/m³ (LC50)

Intraperitoneal - Mouse: 1140 MG/KG (LD50)

Subcutaneous - Mouse: 2700 MG/KG (LD50)

Remarks: Behavioral:General anesthetic.

Kidney, Ureter, Bladder:Hematuria.

Skin - Rabbit: 3560 UL/KG (LD50)

Inhalation - Mammal: 38,000 mg/m³ (LC50)

Oral - Rat: 2490 mg/kg (LD50)

Irritation Data

Skin - Rabbit:
Remarks: No irritation effect

Skin - Rabbit: 410 mg
Remarks: Open irritation test

Eyes - Rabbit: 20 mg 24H
Remarks: Moderate irritation effect

Chronic Exposure - Mutagen					
<u>Species</u>	<u>Dose</u>	<u>Cell Type</u>	<u>Mutation test</u>		
Rat	30 MMOL/L		liver	Unscheduled DNA synthesis	
Mouse	30 MG/KG	Intraperitoneal		sperm	
Mouse	15 GM/KG	Oral		sperm	
Hamster	9 MG/L		ovary	Sister chromatid exchange	
Hamster	3 MMOL/L		lung	Mutation in mammalian somatic cells.	
Mammal	100 MMOL/L		lymphocyte	DNA damage	

Section 12 - Ecological Information

Physical Properties Affecting Ecotoxicity
BOD: BOD after 5 Days: 28 - 43 %

Acute Ecotoxicity Tests

Test Type
 EC50 Algae
Time: 24.0 h **Value:** 380 mg/l

Test Type
 EC50 Daphnia

Species
 Daphnia magna

Time: 24.0 h **Value:** 195 mg/l

Test Type

LC50 Fish

Species

Leuciscus idus

Time: 48.0 h **Value:** 57 - 114 mg/l

Test Type

LC50 Fish

Species

Pimephales promelas (Fathead minnow)

Time: 96.0 h **Value:** 25.8 mg/l

Elimination

Section 13 - Disposal Considerations

Appropriate Method of Disposal of Substance or Preparation

Contact a licensed professional waste disposal service to dispose of this material.
 Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable.
 Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT

Proper Shipping Name: Butyraldehyde
UN#: 1129
Class: 3
Packing Group: Packing Group II
Hazard Label: Flammable liquid
PIH: Not PIH

IATA
Proper Shipping Name: Butyraldehyde
IATA UN Number: 1129
Hazard Class: 3
Packing Group: II

Section 15 - Regulatory Information

EU Directives Classification

Symbol of Danger: F
Indication of Danger
 Highly Flammable,
Risk Statements R: 11
 Highly flammable.
Safety Statements S: 9 29 33
 Keep container in a well-ventilated place. Do not empty into drains. Take precautionary measures against static discharges.

US Classification and Label Text

Indication of Danger
 Flammable (USA) Highly Flammable (EU). Irritant.
Risk Statements
 Irritating to eyes, respiratory system and skin.
Safety Statements
 Keep container in a well-ventilated place. Do not empty into drains. Take precautionary measures against static discharges.

United States Regulatory Information

SARA Listed: Yes
Demoln/MS: 1 %
Notes: This product is subject to SARA section 313 reporting requirements.

TSCA Inventory Item: Yes Yes

Canada Regulatory Information

WHMIS Classification
 This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.
DSL: Yes
NDSL: No

Section 16 - Other Information

Disclaimer

For R&D use only. Not for drug, household or other uses.

Warranty

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2005 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

