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SIGMA-ALDRICH

Material Safety Data Sheet

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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), Butal, Butaldehyde, Butalyde, Butanal, n-Butanal (Czech), Butanaldehyde, Butyl aldehyde, n-Butyl aldehyde, Butyral, 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.

HMS 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.

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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	Color
Physical State	Colorless
Clear liquid	
Molecular Weight:	72.11 AMU
pH	6 - 7
BP/BP Range	74 - 75 °C
MP/MP Range	-96 °C
Freezing Point	N/A
Vapor Pressure	90 mmHg
Vapor Density	2.5 g/l
Saturated Vapor Conc.	N/A
SG/Density	0.805 g/cm3
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
Surface Tension	29.9 mN/m
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	50D		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: **Value:**
24.0 h 380 mg/l

Test Type
EC50 Daphnia
Species
Daphnia magna
Time: **Value:**
24.0 h 195 mg/l

Test Type
LC50 Fish
Species
Leuciscus idus
Time: **Value:**
48.0 h 57 - 114 mg/l

Test Type
LC50 Fish
Species
Pimephales promelas (Fathead minnow)
Time: **Value:**
96.0 h 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
De minimis: 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.

