



**SIGMA-ALDRICH**

## Material Safety Data Sheet

Date Printed: 06/07/2006  
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Version 1.80

### Section 1 - Product and Company Information

Product Name	BUTYRALDEHYDE, STAB.
Product Number	20710
Brand	Fluka Chemical
Company	Sigma-Aldrich
Street Address	3050 Spruce Street
City, State, Zip, Country	SAINT LOUIS, MO 63103 US
Technical Phone:	800-325-5832
Fax:	800-325-5052
Emergency Phone:	314-776-6555

### 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.

**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.

**Flesh Point:** 23 °F      -5 °C

**Explosion Limits:** Lower: 2 %      Upper: 11.8 %

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

#### Extinguishing Media

##### Suitable

For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.

#### 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**

Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate - use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air 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

<b>pH</b>	6 - 7	20 °C	Concentration: 71 g/l
<b>BP/BP Range</b>	74 - 75 °C		
<b>MP/MP Range</b>	-96 °C		
<b>Freezing Point</b>	N/A		
<b>Vapor Pressure</b>	90 mmHg	20 °C	
<b>Vapor Density</b>	2.5 g/l		
<b>Saturated Vapor Conc.</b>	N/A		
<b>SG/Density</b>	0.805 g/cm <sup>3</sup>		
<b>Bulk Density</b>	N/A		
<b>Odor Threshold</b>	N/A		
<b>Volatile%</b>	N/A		
<b>VOC Content</b>	N/A		
<b>Water Content</b>	N/A		
<b>Solvent Content</b>	N/A		
<b>Evaporation Rate</b>	N/A		
<b>Viscosity</b>	0.43 Pas	20 °C	
<b>Surface Tension</b>	29.9 mN/m	24 °C	
<b>Partition Coefficient</b>	Log Kow: 0.79		
<b>Decomposition Temp.</b>	N/A		
<b>Flash Point °F</b>	23 °F	Method: closed cup	
<b>Flash Point °C</b>	-5 °C	Method: closed cup	

**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**

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.

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/m<sup>3</sup> (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/m<sup>3</sup> (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 (Falhead 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  
**Deminimis:** 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 2006 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

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