1. PRODUCT AND COMPANY IDENTIFICATION

Product name: Butyraldehyde

Product Number: 20710
Brand: Fluka
Supplier: Sigma-Aldrich
       3050 Spruce Street
       SAINT LOUIS MO  63103
       USA
Telephone: +1 800-325-5832
Fax: +1 800-325-5052
Emergency Phone #: (314) 776-6555
Preparation Information: Sigma-Aldrich Corporation
Product Safety - Americas Region
1-800-521-8956

2. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards
Flammable liquid, Irritant

GHS Classification
Flammable liquids (Category 2)
Acute toxicity, Oral (Category 5)
Acute toxicity, Inhalation (Category 5)
Acute toxicity, Dermal (Category 5)
Eye irritation (Category 2A)
Acute aquatic toxicity (Category 3)

GHS Label elements, including precautionary statements

Pictogram

Signal word: Danger

Hazard statement(s)
H225 Highly flammable liquid and vapour.
H303 + H313 May be harmful if swallowed or in contact with skin.
H319 Causes serious eye irritation.
H333 May be harmful if inhaled.
H402 Harmful to aquatic life.

Precautionary statement(s)
P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

HMIS Classification
Health hazard: 2
Flammability: 3
Physical hazards: 0
NFPA Rating

- Health hazard: 2
- Fire: 3
- Reactivity Hazard: 0

Potential Health Effects

- **Inhalation**: May be harmful if inhaled. Causes respiratory tract irritation.
- **Skin**: May be harmful if absorbed through skin. Causes skin irritation.
- **Eyes**: Causes eye irritation.
- **Ingestion**: May be harmful if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

**Synonyms**: Butanal

**Formula**: \(C_4H_8O\)

**Molecular Weight**: 72.11 g/mol

<table>
<thead>
<tr>
<th>Component</th>
<th>Concentration</th>
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<tbody>
<tr>
<td>Butyraldehyde</td>
<td>&lt;= 100 %</td>
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<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>EC-No.</th>
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<tbody>
<tr>
<td>Butyraldehyde</td>
<td>123-72-8</td>
<td>204-646-6</td>
<td>605-006-00-2</td>
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</table>

4. FIRST AID MEASURES

**General advice**
Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

**If inhaled**
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

**In case of skin contact**
Wash off with soap and plenty of water. Consult a physician.

**In case of eye contact**
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

**If swallowed**
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIREFIGHTING MEASURES

**Conditions of flammability**
Flammable in the presence of a source of ignition when the temperature is above the flash point. Keep away from heat/sparks/open flame/hot surface. No smoking.

**Suitable extinguishing media**
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

**Special protective equipment for firefighters**
Wear self contained breathing apparatus for fire fighting if necessary.

**Hazardous combustion products**
Hazardous decomposition products formed under fire conditions. - Carbon oxides

**Further information**
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES
Personal precautions
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

7. HANDLING AND STORAGE

Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Use explosion-proof equipment. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

Conditions for safe storage
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Store under inert gas. Air sensitive. Stench. Dry residue is explosive.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
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<tr>
<td>Butyraldehyde</td>
<td>123-72-8</td>
<td>TWA</td>
<td>25 ppm</td>
<td>USA. Workplace Environmental Exposure Levels (WEEL)</td>
</tr>
</tbody>
</table>

Personal protective equipment

Respiratory protection
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. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove’s outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Splash contact
Material: butyl-rubber
Minimum layer thickness: 0.3 mm
Break through time: 30 min
Material tested: Butoject® (KCL 897 / Aldrich Z677647, Size M)
data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Eye protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin and body protection
impervious clothing, Flame retardant antistatic protective clothing, The type of protective equipment must be
selected according to the concentration and amount of the dangerous substance at the specific workplace.

**Hygiene measures**
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

#### Appearance
- **Form**: clear, liquid
- **Colour**: colourless

#### Safety data
- **pH**: 6.0 - 7.0 at 71 g/l at 20 °C (68 °F)
- **Melting point/freezing point**: -96 °C (-141 °F) - lit.
- **Boiling point**: 75 °C (167 °F) - lit.
- **Flash point**: -5 °C (23 °F) - closed cup
- **Ignition temperature**: 190 °C (374 °F)
- **Auto-ignition temperature**: no data available
- **Lower explosion limit**: 1.8 %(V)
- **Upper explosion limit**: 8 %(V)
- **Vapour pressure**: 120 hPa (90 mmHg) at 20 °C (68 °F)
- **Density**: 0.8 g/mL at 25 °C (77 °F)
- **Water solubility**: soluble
- **Partition coefficient**: log Pow: 0.79
- **Relative vapour density**: 2.49 - (Air = 1.0)
- **Odour**: unpleasant
- **Odour Threshold**: no data available
- **Evaporation rate**: no data available

### 10. STABILITY AND REACTIVITY

#### Chemical stability
Stable under recommended storage conditions.

#### Possibility of hazardous reactions
Vapours may form explosive mixture with air.

#### Conditions to avoid
Heat, flames and sparks. Extremes of temperature and direct sunlight.

#### Materials to avoid
Oxidizing agents, Strong bases, Strong reducing agents, Strong acids

#### Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - no data available

Contains the following stabiliser(s):
- BHT (0.1 %)
- Water (1 %)
11. TOXICOLOGICAL INFORMATION

**Acute toxicity**

**Oral LD50**
LD50 Oral - rat - 2,490 mg/kg

**Inhalation LC50**
LC50 Inhalation - mouse - 2 h - 44,610 mg/m³

**Dermal LD50**
LD50 Dermal - rabbit - 3,560 mg/kg

**Other information on acute toxicity**
no data available

**Skin corrosion/irritation**
Skin - rabbit - No skin irritation

**Serious eye damage/eye irritation**
Eyes - rabbit - Moderate eye irritation - 24 h

**Respiratory or skin sensitisation**
no data available

**Germ cell mutagenicity**
Positive result(s) from mutagenicity tests in mammals. Evidence that the substance has potential to cause mutations to germ cells

- Genotoxicity in vitro - Hamster - ovary
- Sister chromatid exchange
- Genotoxicity in vitro - Hamster - Lungs
- Mutation in mammalian somatic cells.
- Genotoxicity in vitro - rat - Liver
- Unscheduled DNA synthesis
- Genotoxicity in vitro - Mammal - lymphocyte
- DNA damage
- Genotoxicity in vivo - mouse - Oral
- sperm
- Genotoxicity in vivo - mouse - Intraperitoneal
- sperm

**Carcinogenicity**

carcinogenic effects

- IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
- ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
- NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
- OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

**Reproductive toxicity**

no data available

**Teratogenicity**
Specific target organ toxicity - single exposure (Globally Harmonized System)  
no data available

Specific target organ toxicity - repeated exposure (Globally Harmonized System)  
no data available

Aspiration hazard  
no data available

Potential health effects

Inhalation  
May be harmful if inhaled. Causes respiratory tract irritation.

Ingestion  
May be harmful if swallowed.

Skin  
May be harmful if absorbed through skin. Causes skin irritation.

Eyes  
Causes eye irritation.

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

Synergistic effects  
no data available

Additional Information
RTECS: ES2275000

12. ECOLOGICAL INFORMATION

Toxicity

Toxicity to fish  
LC50 - Pimephales promelas (fathead minnow) - 25.8 mg/l - 96 h

Toxicity to daphnia and other aquatic invertebrates  
EC50 - Daphnia magna (Water flea) - 195 mg/l - 24 h

Persistence and degradability

Biodegradability

Bioaccumulative potential  
no data available

Mobility in soil  
no data available

PBT and vPvB assessment  
no data available

Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Harmful to aquatic life.

13. DISPOSAL CONSIDERATIONS

Product

Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 1129  
Class: 3  
Packing group: II
Proper shipping name: Butyraldehyde
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG
UN number: 1129  Class: 3  Packing group: II  EMS-No: F-E, S-D
Proper shipping name: BUTYRALDEHYDE
Marine pollutant: No

IATA
UN number: 1129  Class: 3  Packing group: II
Proper shipping name: Butyraldehyde

15. REGULATORY INFORMATION

OSHA Hazards
Flammable liquid, Irritant

SARA 302 Components
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

<table>
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SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard

Massachusetts Right To Know Components

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Pennsylvania Right To Know Components

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New Jersey Right To Know Components

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California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Further information
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