

Material Safety Data Sheet

Version 4.0

Revision Date 03/13/2010

Print Date 04/09/2010

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : 2-Butanol

Product Number : 294810

Brand : Sigma-Aldrich

Company : Sigma-Aldrich Canada, Ltd
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2. HAZARDS IDENTIFICATION

Emergency Overview

WHMIS Classification

B2 Flammable liquid
D2B

Flammable liquid
Moderate respiratory irritant
Moderate eye irritant

GHS Label elements, including precautionary statements

Pictogram



Signal word : Warning

Hazard statement(s)

H226 : Flammable liquid and vapour.
H303 + H313 : May be harmful if swallowed or in contact with skin.
H319 : Causes serious eye irritation.
H371 : May cause damage to organs.

Precautionary statement(s)

P260 : Do not breathe dust/fume/gas/mist/vapours/spray.
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

Potential Health Effects

Inhalation : May be harmful if inhaled. Causes respiratory tract irritation. Vapours may cause drowsiness and dizziness.

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 : sec-Butyl alcohol

Formula : C₄H₁₀O
Molecular Weight : 74.12 g/mol

CAS-No.	EC-No.	Index-No.	Concentration
Butan-2-ol			
78-92-2	201-158-5	603-127-00-5	-

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. FIRE-FIGHTING MEASURES

Suitable extinguishing media

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.

Special protective equipment for fire-fighters

Wear self contained breathing apparatus for fire fighting if necessary.

Further information

Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

Environmental precautions

Do not let product enter drains.

Methods and materials for containment and cleaning up

Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.

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. Store in cool place.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value	Control parameters	Update	Basis
Butan-2-ol	78-92-2	TWA	100 ppm 303 mg/m3	2009-04-30	Canada. Alberta, Occupational Health and Safety Code (table 2: OEL)
		TWA	100 ppm	2006-11-29	Canada. British Columbia OEL
		TWAE V	100 ppm 303 mg/m3	2005-12-17	Canada. Ontario OELs
		STEV	150 ppm 454 mg/m3	2005-12-17	Canada. Ontario OELs
		TWAE V	100 ppm 303 mg/m3	2006-12-29	Canada. Quebec OELs

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.

Eye protection

Face shield and safety glasses

Skin and body protection

Choose body protection according to the amount and concentration of the dangerous substance at the work place.

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 liquid

Safety data

pH no data available

Melting point -115 °C (-175 °F) - lit.

Boiling point 98 °C (208 °F) - lit.

Flash point 27 °C (81 °F) - closed cup

Ignition temperature 390 °C (734 °F)

Lower explosion limit 1.7 %(V)

Upper explosion limit 9.8 %(V)

Vapour pressure 15.3 hPa (11.5 mmHg) at 20 °C (68 °F)
24.4 hPa (18.3 mmHg) at 25 °C (77 °F)

Density 0.808 g/cm3 at 25 °C (77 °F)

Water solubility soluble

Partition coefficient: log Pow: 0.61

n-octanol/water

Relative vapour density 2.56
 - (Air = 1.0)

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.

Materials to avoid

acids, Acid chlorides, Acid anhydrides, Oxidizing agents, Halogens, Peroxides

Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides

11. TOXICOLOGICAL INFORMATION

Acute toxicity

LD50 Oral - rat - 2,193 mg/kg

Remarks: Behavioral:Somnolence (general depressed activity). Behavioral:Ataxia. Behavioral:Coma.

LD50 Dermal - rat - > 2,000 mg/kg

Skin corrosion/irritation

no data available

Serious eye damage/eye irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

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.

Reproductive toxicity

Reproductive toxicity - rat - Inhalation

Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Effects on Embryo or Fetus: Fetal death. Specific Developmental Abnormalities: Musculoskeletal system.

Developmental Toxicity - rat - Inhalation

Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Specific target organ toxicity - single exposure (GHS)

May cause damage to organs.

May cause damage to organs.

May cause damage to organs.

Specific target organ toxicity - repeated exposure (GHS)

no data available

Aspiration hazard

no data available

Potential health effects

Inhalation

May be harmful if inhaled. Causes respiratory tract irritation. Vapours may cause drowsiness and dizziness.

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

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

Additional Information

RTECS: EO1750000

12. ECOLOGICAL INFORMATION

Toxicity

Toxicity to fish	LC50 - Pimephales promelas (fathead minnow) - 3,670 mg/l - 96 h
Toxicity to daphnia and other aquatic invertebrates.	EC50 - Daphnia magna (Water flea) - 4,227 mg/l - 48 h
	EC100 - Daphnia magna (Water flea) - 5,000 mg/l - 24 h

Persistence and degradability

no data available

Bioaccumulative potential

no data available

Mobility in soil

no data available

PBT and vPvB assessment

no data available

Other adverse effects

no data available

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. This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations. 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: 1120 Class: 3	Packing group: III
Proper shipping name: Butanols	
Marine pollutant: No	
Poison Inhalation Hazard: No	

IMDG

UN-Number: 1120 Class: 3	Packing group: III	EMS-No: F-E, S-D
Proper shipping name: BUTANOLS		
Marine pollutant: No		

IATA

UN-Number: 1120 Class: 3	Packing group: III
Proper shipping name: Butanols	

15. REGULATORY INFORMATION

DSL Status

All components of this product are on the Canadian DSL list.

WHMIS Classification

B2 Flammable liquid
D2B

Flammable liquid
Moderate respiratory irritant
Moderate eye irritant

16. OTHER INFORMATION**Further information**

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