

**SIGMA-ALDRICH****Material Safety Data Sheet**Version 3.4  
Revision Date 11/19/2007  
Print Date 04/16/2009**1. PRODUCT AND COMPANY IDENTIFICATION**

Product name : Ethanol

Product Number : E7023  
Brand : Sigma-Aldrich

Company : 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

**2. COMPOSITION/INFORMATION ON INGREDIENTS**

Synonyms : Ethyl alcohol

Formula : C<sub>2</sub>H<sub>6</sub>O  
Molecular Weight : 46.07 g/mol

CAS-No.	EC-No.	Index-No.	Concentration
<b>Ethanol</b>			
64-17-5	200-578-6	603-002-00-5	-

**3. HAZARDS IDENTIFICATION****Emergency Overview****OSHA Hazards**

Flammable Liquid  
Target Organ Effect  
Irritant

**Target Organs**

Nerves., Liver, Heart

**HMIS Classification**

Health Hazard: 2  
Chronic Health Hazard: \*  
Flammability: 3  
Physical hazards: 0

**NFPA Rating**

Health Hazard: 2  
Fire : 3  
Reactivity Hazard: 0

**Potential Health Effects**

Sigma-Aldrich Corporation  
www.sigma-aldrich.com

Sigma-Aldrich - E7023  
Delivery 0832003423-000010 Purchase Order CC/041609TP

Page 1 of 6

**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.

**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**

Flush eyes with water as a precaution.

**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****Flammable properties**

Flash point 14.0 °C (57.2 °F) - closed cup

Ignition temperature 363 °C (685 °F)

**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**

Avoid breathing vapors, 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.

**Methods for 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).

**7. HANDLING AND STORAGE****Handling**

Avoid inhalation of vapour or mist.

Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

**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 in cool place.

Sigma-Aldrich - E7023  
Delivery 0832003423-000010 Purchase Order CC/041609TP

Sigma-Aldrich Corporation  
www.sigma-aldrich.com

Page 2 of 6

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### Components with workplace control parameters

Components	CAS-No.	Value	Control parameters	Update	Basis
Ethanol	64-17-5	TWA	1,000 ppm 1,880 mg/m <sup>3</sup>	1996-05-18	US. American Conference of Governmental and Industrial Hygienists Threshold Limit Values for Chemical Substances in the Work Environment; Annual Reports for the Year 2004; Committees on Threshold Limit Values (TLVs ) and Biological Exposure Indices (BEIs)
Remarks	Refers to Appendix A -- Carcinogens. 1996 Adoption				
		TWA	1,000 ppm 1,900 mg/m <sup>3</sup>	1989-03-01	US. Department of Labor - Occupational Safety and Health Administration (OSHA) 29 CFR 1910.1000 Z-1-A
		TWA	1,000 ppm 1,900 mg/m <sup>3</sup>	1993-06-30	US. Department of Labor - Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PEL) 29 CFR 1910.1000 Air Contaminants.

### 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

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, clear  
Colour colourless

## Safety data

pH no data available  
Melting point -144.0 °C (-227.2 °F)  
Boiling point 78.0 - 80.0 °C (172.4 - 176.0 °F)  
Flash point 14.0 °C (57.2 °F) - closed cup  
Ignition temperature 363 °C (685 °F)  
Lower explosion limit 3.3 %(V)  
Upper explosion limit 19 %(V)  
Vapour pressure 59.5 hPa (44.6 mmHg) at 20.0 °C (68.0 °F)  
Density 0.79 g/cm<sup>3</sup>  
Water solubility completely soluble

## 10. STABILITY AND REACTIVITY

### Storage stability

Stable under recommended storage conditions.

### Conditions to avoid

Heat, flames and sparks.

### Materials to avoid

Alkali metals, Ammonia, Oxidizing agents, Peroxides

### Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - None known.

### Hazardous reactions

Vapours may form explosive mixture with air.

## 11. TOXICOLOGICAL INFORMATION

### Acute toxicity

LD50 Oral - rat - 7,060 mg/kg

Remarks: Lungs, Thorax, or Respiration:Other changes.

LC50 Inhalation - rat - 10 h - 20000 ppm

### Irritation and corrosion

Skin - rabbit - Skin irritation - 24 h

Eyes - rabbit - Mild eye irritation - 24 h

### Sensitisation

no data available

### Chronic exposure

Carcinogenicity - mouse - Oral

Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Liver:Tumors. Blood:Lymphomas including Hodgkin's disease.

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

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 - Human - female - Oral  
Effects on Newborn: Apgar score (human only). Effects on Newborn: Other neonatal measures or effects. Effects on Newborn: Drug dependence.

#### Signs and Symptoms of Exposure

Central nervous system depression, narcosis, Damage to the heart., To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

#### Potential Health Effects

<b>Inhalation</b>	May be harmful if inhaled. Causes respiratory tract irritation.
<b>Skin</b>	May be harmful if absorbed through skin. Causes skin irritation.
<b>Eyes</b>	Causes eye irritation.
<b>Ingestion</b>	May be harmful if swallowed.
<b>Target Organs</b>	Nerves., Liver, Heart,

#### 12. ECOLOGICAL INFORMATION

##### Elimination information (persistence and degradability)

no data available

##### Ecotoxicity effects

Toxicity to fish	LC50 - Oncorhynchus mykiss (rainbow trout) - 13,000.00 mg/l - 96 h
	LC50 - Oncorhynchus mykiss (rainbow trout) - 10,400.00 mg/l - 96 h
	LC50 - Pimephales promelas (fathead minnow) - 15,300.00 mg/l - 96 h
	LC50 - other fish - 10,000.00 mg/l - 24 h
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 9.30 mg/l - 48 h

##### Further information on ecology

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. 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: 1170 Class: 3 Packing group: II  
Proper shipping name: Ethanol

Sigma-Aldrich Corporation  
www.sigma-aldrich.com

Sigma-Aldrich - E7023  
Delivery 0832003423-000010 Purchase Order CC/041609TP

Page 5 of 6

##### IMDG

UN-Number: 1170 Class: 3 Packing group: II EMS-No: F-E, S-D  
Proper shipping name: ETHANOL  
Marine pollutant: No

##### IATA

UN-Number: 1170 Class: 3 Packing group: II  
Proper shipping name: Ethanol

#### 15. REGULATORY INFORMATION

##### OSHA Hazards

Flammable Liquid, Target Organ Effect, Irritant

##### TSCA Status

On TSCA Inventory

##### DSL Status

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

##### 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

SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

##### SARA 311/312 Hazards

Fire Hazard, Acute Health Hazard, Chronic Health Hazard

##### Massachusetts Right To Know Components

Ethanol	CAS-No. 64-17-5	Revision Date 1989-12-01
---------	--------------------	-----------------------------

##### Pennsylvania Right To Know Components

Ethanol	CAS-No. 64-17-5	Revision Date 1989-12-01
---------	--------------------	-----------------------------

##### New Jersey Right To Know Components

Ethanol	CAS-No. 64-17-5	Revision Date 1989-12-01
---------	--------------------	-----------------------------

##### California Prop. 65 Components

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

#### 16. OTHER INFORMATION

##### Further information

Copyright 2007 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only. 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 Co., 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.

Sigma-Aldrich - E7023  
Delivery 0832003423-000010 Purchase Order CC/041609TP

Sigma-Aldrich Corporation  
www.sigma-aldrich.com

Page 6 of 6

00000961