1. PRODUCT AND COMPANY IDENTIFICATION

Product name : 2-Propanol
Product Number : 650447
Brand : Sigma-Aldrich
Supplier : Sigma-Aldrich
            3050 Spruce Street
            SAINT LOUIS MO  63103
            USA
Telephone : +1 800-325-5832
Fax : +1 800-325-5052
Emergency Phone # (For both supplier and manufacturer) : (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, Target Organ Effect, Irritant

Target Organs
Nerves., Kidney, Cardiovascular system., Gastrointestinal tract, Liver

GHS Classification
Flammable liquids (Category 2)
Skin irritation (Category 3)
Eye irritation (Category 2A)
Specific target organ toxicity - single exposure (Category 3)

GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H225 Highly flammable liquid and vapour.
H316 Causes mild skin irritation.
H319 Causes serious eye irritation.
H336 May cause drowsiness or dizziness.

Precautionary statement(s)
P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P261 Avoid breathing 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
Chronic Health Hazard: *
Flammability: 3
Physical hazards: 0
Reactivity: 1

NFPA Rating
Health hazard: 2
Fire: 3
Reactivity Hazard: 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: Isopropanol

Formula: C3H8O

Molecular Weight: 60.1 g/mol

<table>
<thead>
<tr>
<th>CAS-No.</th>
<th>EC-No.</th>
<th>Index-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>67-63-0</td>
<td>200-661-7</td>
<td>603-117-00-0</td>
<td></td>
</tr>
</tbody>
</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. FIRE-FIGHTING 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 fire-fighters
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 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 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.
Handle and store under inert gas. Hygroscopic.

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>
</tr>
</thead>
<tbody>
<tr>
<td>2-Propanol</td>
<td>67-63-0</td>
<td>TWA</td>
<td>200 ppm</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
</tbody>
</table>

Remarks
Eye & Upper Respiratory Tract irritation Central Nervous System impairment Not classifiable as a human carcinogen: Agents which cause concern that they could be carcinogenic for humans but which cannot be assessed conclusively because of a lack of data. In vitro or animal studies do not provide indications of carcinogenicity which are sufficient to classify the agent into one of the other categories.

| STEL       | 400 ppm | USA. ACGIH Threshold Limit Values (TLV) |

Eye & Upper Respiratory Tract irritation Central Nervous System impairment Not classifiable as a human carcinogen: Agents which cause concern that they could be carcinogenic for humans but which cannot be assessed conclusively because of a lack of data. In vitro or animal studies do not provide indications of carcinogenicity which are sufficient to classify the agent into one of the other categories.

| TWA        | 400 ppm | USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000 |
|           | 980 mg/m3 | |
| STEL      | 500 ppm | USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000 |
|           | 1,225 mg/m3 | |
| TWA        | 400 ppm | USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants |
|           | 980 mg/m3 | |

The value in mg/m3 is approximate.

| TWA        | 400 ppm | USA. NIOSH Recommended Exposure Limits |
|           | 980 mg/m3 | |
| ST         | 500 ppm | USA. NIOSH Recommended Exposure Limits |
|           | 1,225 mg/m3 |
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.

**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: liquid
- Colour: colourless

**Safety data**
- pH: no data available
- Melting point/freezing point: -89.5 °C (-129.1 °F)
- Boiling point: 81.0 - 83.0 °C (177.8 - 181.4 °F)
- Flash point: 12.0 °C (53.6 °F) - closed cup
- Ignition temperature: 425 °C (797 °F)
- Autoignition temperature: 425.0 °C (797.0 °F)
- Lower explosion limit: 2 %(V)
- Upper explosion limit: 12.7 %(V)
- Vapour pressure: 43.2 hPa (32.4 mmHg) at 20.0 °C (68.0 °F) 58.7 hPa (44.0 mmHg) at 25.0 °C (77.0 °F)
- Density: 0.78 g/cm³
- Water solubility: completely soluble
- Partition coefficient: n-octanol/water: log Pow: 0.05
- Relative vapour density: no data available
- Odour: alcohol-like
- Odour Threshold: no data available
- Evaporation rate: 3.0

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. Extremes of temperature and direct sunlight.

Materials to avoid
Oxidizing agents, Acid anhydrides, Aluminium, Halogenated compounds, Acids

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

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Oral LD50
LD50 Oral - rat - 5,045 mg/kg

Inhalation LC50
LC50 Inhalation - rat - 8 h - 16000 ppm

Dermal LD50
LD50 Dermal - rabbit - 12,800 mg/kg

Other information on acute toxicity
no data available

Skin corrosion/irritation
Skin - rabbit - Mild skin irritation

Serious eye damage/eye irritation
Eyes - rabbit - Eye irritation - 24 h

Respiratory or skin sensitization
no data available

Germ cell mutagenicity
no data available

Carcinogenicity
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: 3 - Group 3: Not classifiable as to its carcinogenicity to humans (2-Propanol)
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

no data available

**Specific target organ toxicity - single exposure (Globally Harmonized System)**
May cause drowsiness or dizziness.

**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. 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**
Central nervous system depression, prolonged or repeated exposure can cause: Nausea, Headache, Vomiting, narcosis, Drowsiness, Overexposure may cause mild, reversible liver effects.

**Synergistic effects**
no data available

**Additional Information**
RTECS: NT8050000

### 12. ECOLOGICAL INFORMATION

**Toxicity**

- **Toxicity to fish**
  LC50 - Pimephales promelas (fathead minnow) - 9,640.00 mg/l - 96 h

- **Toxicity to daphnia and other aquatic invertebrates.**
  EC50 - Daphnia magna (Water flea) - 5,102.00 mg/l - 24 h
  Immobilization EC50 - Daphnia magna (Water flea) - 6,851 mg/l - 24 h

- **Toxicity to algae**
  EC50 - Desmodesmus subspicatus (green algae) - > 2,000.00 mg/l - 72 h
  EC50 - Algae - > 1,000.00 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. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.
14. TRANSPORT INFORMATION

**DOT (US)**
- UN number: 1219  
- Class: 3  
- Proper shipping name: Isopropanol  
- Reportable Quantity (RQ):  
- Marine pollutant: No  
- Poison Inhalation Hazard: No  
- Packing group: II

**IMDG**
- UN number: 1219  
- Class: 3  
- Proper shipping name: ISOPROPANOL  
- Marine pollutant: No  
- Packing group: II  
- EMS-No: F-E, S-D

**IATA**
- UN number: 1219  
- Class: 3  
- Proper shipping name: Isopropanol  
- Packing group: II

15. REGULATORY INFORMATION

**OSHA Hazards**
- Flammable liquid, Target Organ Effect, 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:
  - | Component | CAS-No. | Revision Date |
  - | 2-Propanol | 67-63-0 | 1987-01-01 |

**SARA 311/312 Hazards**
- Fire Hazard, Acute Health Hazard, Chronic Health Hazard

**Massachusetts Right To Know Components**
- | Component | CAS-No. | Revision Date |
  - | 2-Propanol | 67-63-0 | 1987-01-01 |

**Pennsylvania Right To Know Components**
- | Component | CAS-No. | Revision Date |
  - | 2-Propanol | 67-63-0 | 1987-01-01 |

**New Jersey Right To Know Components**
- | Component | CAS-No. | Revision Date |
  - | 2-Propanol | 67-63-0 | 1987-01-01 |

**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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- 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.