SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Identification of the substance          2-Methyl-1-propanol
Article number                       CP09
Registration number (REACH)        01-2119484609-23-xxxx
Index No                            603-108-00-1
EC number                           201-148-0
CAS number                          78-83-1

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses:                      laboratory chemical

1.3 Details of the supplier of the safety data sheet

Carl Roth GmbH + Co KG
Schoemperlenstr. 3-5
D-76185 Karlsruhe
Germany

Telephone: +49 (0) 721 - 56 06 0
Telefax: +49 (0) 721 - 56 06 149
e-mail: sicherheit@carlroth.de
Website: www.carlroth.de

Competent person responsible for the safety data sheet: Department Health, Safety and Environment

e-mail (competent person): sicherheit@carlroth.de

1.4 Emergency telephone number

Emergency information service
Poison Centre Munich: +49/(0)89 19240

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 (CLP)

<table>
<thead>
<tr>
<th>Section</th>
<th>Hazard class</th>
<th>Hazard class and category</th>
<th>Hazard statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.6</td>
<td>flammable liquid</td>
<td>(Flam. Liq. 3)</td>
<td>H226</td>
</tr>
<tr>
<td>3.2</td>
<td>skin corrosion/irritation</td>
<td>(Skin Irr. 2)</td>
<td>H315</td>
</tr>
<tr>
<td>3.3</td>
<td>serious eye damage/eye irritation</td>
<td>(Eye Dam. 1)</td>
<td>H318</td>
</tr>
<tr>
<td>3.8R</td>
<td>specific target organ toxicity - single exposure (respiratory tract irritation)</td>
<td>(STOT SE 3)</td>
<td>H335</td>
</tr>
<tr>
<td>3.8D</td>
<td>specific target organ toxicity - single exposure (narcotic effects, drowsiness)</td>
<td>(STOT SE 3)</td>
<td>H336</td>
</tr>
</tbody>
</table>
2-Methyl-1-propanol ≥99 %, for synthesis

Remarks
For full text of Hazard- and EU Hazard-statements: see SECTION 16.

The most important adverse physicochemical, human health and environmental effects
Narcotic effects.

2.2 Label elements
Labelling according to Regulation (EC) No 1272/2008 (CLP)

Signal word: Danger

Pictograms

Hazard statements
H226 Flammable liquid and vapour.
H315 Causes skin irritation.
H318 Causes serious eye damage.
H335 May cause respiratory irritation.
H336 May cause drowsiness or dizziness.

Precautionary statements
Precautionary statements - prevention
P210 Keep away from heat, hot surfaces, sparks, open flames. No smoking.
P280 Wear protective gloves/protective clothing/eye protection/face protection.

Precautionary statements - response
P303+P361+P338 IF ON SKIN (or hair): take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312 Call a POISON CENTER/doctor if you feel unwell.

Precautionary statements - storage
P403+P233 Store in a well-ventilated place. Keep container tightly closed.

Labelling of packages where the contents do not exceed 125 ml
Signal word: Danger

Symbol(s)

H318 Causes serious eye damage.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
2-Methyl-1-propanol ≥99 %, for synthesis

article number: CP09

2.3 Other hazards
There is no additional information.

SECTION 3: Composition/information on ingredients

3.1 Substances

- Name of substance: 2-Methyl-1-propanol
- Index No: 603-108-00-1
- Registration number (REACH): 01-2119484609-23-xxxx
- EC number: 201-148-0
- CAS number: 78-83-1
- Molecular formula: C₄H₁₀O
- Molar mass: 74.12 g/mol

SECTION 4: First aid measures

4.1 Description of first aid measures

General notes
Take off contaminated clothing.

Following inhalation
Provide fresh air. In all cases of doubt, or when symptoms persist, seek medical advice.

Following skin contact
Rinse skin with water/shower. In case of skin irritation, consult a physician.

Following eye contact
In case of contact with eyes flush immediately with plenty of flowing water for 10 to 15 minutes holding eyelids apart and consult an ophthalmologist.

Following ingestion
Rinse mouth. Call a doctor if you feel unwell.

4.2 Most important symptoms and effects, both acute and delayed
Dizziness, Unconsciousness, Headache, Cough, Vomiting, Risk of blindness, Nausea, Risk of serious damage to eyes, Irritation

4.3 Indication of any immediate medical attention and special treatment needed
none
2-Methyl-1-propanol ≥99 %, for synthesis

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**SECTION 5: Firefighting measures**

5.1 Extinguishing media

**Suitable extinguishing media**
Co-ordinate fire-fighting measures to the fire surroundings
foam, alcohol resistant foam, dry extinguishing powder, carbon dioxide (CO2)

**Unsuitable extinguishing media**
water jet

5.2 Special hazards arising from the substance or mixture
Combustible. Vapours are heavier than air, spread along floors and form explosive mixtures with air. Vapours can form explosive mixtures with air.

**Hazardous combustion products**
In case of fire may be liberated: carbon monoxide (CO), carbon dioxide (CO2)

5.3 Advice for firefighters
Fight fire with normal precautions from a reasonable distance. Wear self-contained breathing apparatus.

**SECTION 6: Accidental release measures**

6.1 Personal precautions, protective equipment and emergency procedures

**For non-emergency personnel**
Wearing of suitable protective equipment (including personal protective equipment referred to under Section 8 of the safety data sheet) to prevent any contamination of skin, eyes and personal clothing. Avoid contact with skin, eyes and clothes. Do not breathe vapour/spray. Avoidance of ignition sources.

6.2 Environmental precautions
Keep away from drains, surface and ground water. Explosive properties.

6.3 Methods and material for containment and cleaning up

**Advices on how to contain a spill**
Covering of drains.

**Advices on how to clean up a spill**
Absorb with liquid-binding material (e.g. sand, diatomaceous earth, acid- or universal binding agents).

**Other information relating to spills and releases**
Place in appropriate containers for disposal. Ventilate affected area.

**Reference to other sections**
SECTION 7: Handling and storage

7.1 Precautions for safe handling
- Provision of sufficient ventilation. Provision of sufficient ventilation.
- Measures to prevent fire as well as aerosol and dust generation

Keep away from sources of ignition - No smoking.

Take precautionary measures against static discharge.

Advice on general occupational hygiene
- Wash hands before breaks and after work. Keep away from food, drink and animal feedingstuffs. When using do not smoke.

7.2 Conditions for safe storage, including any incompatibilities
- Keep container tightly closed in a cool place.
- Incompatible substances or mixtures
- Observe hints for combined storage.
- Consideration of other advice
- Ground/bond container and receiving equipment.
- Ventilation requirements
- Use local and general ventilation.
- Specific designs for storage rooms or vessels
- Recommended storage temperature: 15 - 25 °C.

7.3 Specific end use(s)
- No information available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

National limit values
- Occupational exposure limit values (Workplace Exposure Limits)

<table>
<thead>
<tr>
<th>Country</th>
<th>Name of agent</th>
<th>CAS No</th>
<th>Identifier</th>
<th>TWA [ppm]</th>
<th>TWA [mg/m³]</th>
<th>STEL [ppm]</th>
<th>STEL [min]</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>GB</td>
<td>2-methylpropan-1-ol</td>
<td>78-83-1</td>
<td>WEL</td>
<td>50</td>
<td>154</td>
<td>75</td>
<td>15</td>
<td>EH40/2005</td>
</tr>
</tbody>
</table>

Notation
- Short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15-minute period unless otherwise specified
- Time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of 8 hours time-weighted average

Relevant DNELs/DMELs/PNECs and other threshold levels
2-Methyl-1-propanol ≥99 %, for synthesis

article number: CP09

8.2 Exposure controls

Individual protection measures (personal protective equipment)

Eye/face protection
Use safety goggles with side protection.

Skin protection

• hand protection
Wear suitable gloves. Chemical protection gloves are suitable, which are tested according to EN 374. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves.

• type of material
NBR (Nitrile rubber)

• material thickness
0,7mm.

• breakthrough times of the glove material
>480 minutes (permeation: level 6)

• other protection measures
Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended.

Respiratory protection
Respiratory protection necessary at: Aerosol or mist formation. Type: A (against organic gases and vapours with a boiling point of > 65 °C, colour code: Brown). Observe the wear time limits according GefStoffV in combination with the rules for using respiratory protection apparatus (BGR 190).
Environmental exposure controls
Keep away from drains, surface and ground water.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance
- Physical state: liquid (fluid)
- Colour: colourless
- Odour: like: alcohol
- Odour threshold: No data available

Other physical and chemical parameters
- pH (value): 7 (water: 80 g/l, 20 °C)
- Melting point/freezing point: <-90 °C
- Initial boiling point and boiling range: 108 °C at 1.013 hPa
- Flash point: 31 °C at 1.013 hPa
- Evaporation rate: no data available
- Flammability (solid, gas): not relevant (fluid)

Explosive limits
- lower explosion limit (LEL): 1,5 vol%
- upper explosion limit (UEL): 12 vol%
- Explosion limits of dust clouds: not relevant

Vapour pressure: 12 hPa at 20 °C
Density: 0,803 g/cm³ at 20 °C
Vapour density: 2,56 air = 1
Bulk density: Not applicable
Relative density: Information on this property is not available.

Solubility(ies)
- Water solubility: 70 g/l at 20 °C

Partition coefficient
- n-octanol/water (log KOW): 1 (pH value: 7, 25 °C) (ECHA)

Auto-ignition temperature: 400 °C - ECHA
Decomposition temperature: no data available
2-Methyl-1-propanol ≥99 %, for synthesis

Viscosity
- dynamic viscosity
  - 3,95 mPa s at 20 °C
  - 0,52 mPa s at 100 °C

Explosive properties
- none

Oxidising properties
- none

SECTION 10: Stability and reactivity

10.1 Reactivity
- risk of ignition. In case of warming: Vapours can form explosive mixtures with air.

10.2 Chemical stability
- The material is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

10.3 Possibility of hazardous reactions
- Exothermic reaction with: Reducing agents, Acid chlorides, inorganic,
- Dangerous/dangerous reactions with: Strong oxidiser, Aluminium,
- Violent reaction with: Alkali metals, Alkaline earth metal

10.4 Conditions to avoid
- Keep away from heat.

10.5 Incompatible materials
- different plastic and rubber, aluminium

10.6 Hazardous decomposition products
- Hazardous combustion products: see section 5.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

<table>
<thead>
<tr>
<th>Exposure route</th>
<th>Endpoint</th>
<th>Value</th>
<th>Species</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>inhalation: vapour</td>
<td>LC50</td>
<td>24,6 mg/l/4h</td>
<td>rat</td>
<td>TOXNET</td>
</tr>
<tr>
<td>oral</td>
<td>LD50</td>
<td>2,460 mg/kg</td>
<td>rat</td>
<td>TOXNET</td>
</tr>
<tr>
<td>dermal</td>
<td>LD50</td>
<td>3,400 mg/kg</td>
<td>rabbit</td>
<td>TOXNET</td>
</tr>
</tbody>
</table>

Skin corrosion/irritation
- Causes skin irritation.
2-Methyl-1-propanol ≥99 %, for synthesis

Serious eye damage/eye irritation
Causes serious eye damage.

Respiratory or skin sensitisation
Shall not be classified as a respiratory or skin sensitiser.

Summary of evaluation of the CMR properties
Shall not be classified as germ cell mutagenic, carcinogenic nor as a reproductive toxicant

- Specific target organ toxicity - single exposure
May cause respiratory irritation. May cause drowsiness or dizziness.

- Specific target organ toxicity - repeated exposure
Shall not be classified as a specific target organ toxicant (repeated exposure).

Aspiration hazard
Shall not be classified as presenting an aspiration hazard.

Symptoms related to the physical, chemical and toxicological characteristics

- If swallowed
vomiting, nausea

- If in eyes
Causes serious eye damage, risk of blindness

- If inhaled
data are not available

- If on skin
causes skin irritation, risk of absorption via the skin

Other information
Headache, Blood pressure drop, Narcosis, Vertigo, Dizziness

SECTION 12: Ecological information

12.1 Toxicity
acc. to 1272/2008/EC: Shall not be classified as hazardous to the aquatic environment.

Aquatic toxicity (acute)

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>Value</th>
<th>Species</th>
<th>Source</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50</td>
<td>1.430 mg/l</td>
<td>fish</td>
<td>ECHA</td>
<td>96 hours</td>
</tr>
<tr>
<td>EC50</td>
<td>1.100 mg/l</td>
<td>aquatic invertebrates</td>
<td>ECHA</td>
<td>48 hours</td>
</tr>
<tr>
<td>ErC50</td>
<td>1.799 mg/l</td>
<td>algae</td>
<td>ECHA</td>
<td>72 hours</td>
</tr>
</tbody>
</table>

Aquatic toxicity (chronic)

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>Value</th>
<th>Species</th>
<th>Source</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOEC</td>
<td>20 mg/l</td>
<td>aquatic invertebrates</td>
<td>ECHA</td>
<td>21 d</td>
</tr>
</tbody>
</table>
The substance is readily biodegradable.
Theoretical Oxygen Demand: 2.59 mg/mg
Theoretical Carbon Dioxide: 2.375 mg/mg
Biochemical Oxygen Demand: 1.7 g/g

Does not significantly accumulate in organisms.
Data are not available.

Slightly hazardous to water.
This material and its container must be disposed of as hazardous waste. Dispose of contents/container in accordance with local/regional/national/international regulations.
Do not empty into drains.
It is a dangerous waste; only packagings which are approved (e.g. acc. to ADR) may be used.
The allocation of waste identity numbers/waste descriptions must be carried out according to the EEC, specific to the industry and process.
Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities. Please consider the relevant national or regional provisions.
2-Methyl-1-propanol ≥99 %, for synthesis

article number: CP09

**SECTION 14: Transport information**

14.1 UN number 1212

14.2 UN proper shipping name ISOBUTANOL

- **Hazardous ingredients**
  - 2-Methyl-1-propanol

14.3 Transport hazard class(es)

- **Class** 3 (flammable liquids)

14.4 Packing group III (substance presenting low danger)

14.5 Environmental hazards none (non-environmentally hazardous acc. to the dangerous goods regulations)

14.6 **Special precautions for user**

Provisions for dangerous goods (ADR) should be complied within the premises.

14.7 **Transport in bulk according to Annex II of MARPOL and the IBC Code**

The cargo is not intended to be carried in bulk.

14.8 **Information for each of the UN Model Regulations**

- **Transport of dangerous goods by road, rail and inland waterway (ADR/RID/ADN)**

  - **UN number** 1212
  - **Proper shipping name** ISOBUTANOL
  - **Particulars in the transport document** UN1212, ISOBUTANOL, 3, III, (D/E)
  - **Class** 3
  - **Classification code** F1
  - **Packing group** III
  - **Danger label(s)** 3
  - **Excepted quantities (EQ)** E1
  - **Limited quantities (LQ)** 5 L
  - **Transport category (TC)** 3
  - **Tunnel restriction code (TRC)** D/E
  - **Hazard identification No** 30

- **International Maritime Dangerous Goods Code (IMDG)**

  - **UN number** 1212
  - **Proper shipping name** ISOBUTANOL
  - **Particulars in the shipper’s declaration** UN1212, ISOBUTANOL, 3, III, 31°C c.c.
  - **Class** 3
  - **Packing group** III
  - **Danger label(s)** 3
## SECTION 15: Regulatory information

### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

#### Relevant provisions of the European Union (EU)

- **Regulation 649/2012/EU concerning the export and import of hazardous chemicals (PIC)**
  - Not listed.
- **Regulation 1005/2009/EC on substances that deplete the ozone layer (ODS)**
  - Not listed.
  - Not listed.
- **Restrictions according to REACH, Annex XVII**
  - Not listed
- **List of substances subject to authorisation (REACH, Annex XIV)**
  - Not listed
- **Seveso Directive**

#### 2012/18/EU (Seveso III)

<table>
<thead>
<tr>
<th>No</th>
<th>Dangerous substance/hazard categories</th>
<th>Qualifying quantity (tonnes) for the application of lower and upper-tier requirements</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>P5c</td>
<td>flammable liquids (cat. 2, 3)</td>
<td>5.000 50.000</td>
<td>51)</td>
</tr>
</tbody>
</table>

**Notation**

51) Flammable liquids, categories 2 or 3 not covered by P5a and P5b

- **Limitation of emissions of volatile organic compounds due to the use of organic solvents in certain paints and varnishes and vehicle refinishing products (2004/42/EC, Deco-Paint Directive)**
  - VOC content 100 %
- **Directive on industrial emissions (VOCs, 2010/75/EU)**
  - VOC content 100 %
- **Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS) - Annex II**
  - Not listed
2-Methyl-1-propanol ≥99 %, for synthesis

article number: CP09

Regulation 166/2006/EC concerning the establishment of a European Pollutant Release and Transfer Register (PRTR)
not listed

Directive 2000/60/EC establishing a framework for Community action in the field of water policy (WFD)
not listed

National inventories
Substance is listed in the following national inventories:
- EINECS/ELINCS/NLP (Europe)
- REACH (Europe)

15.2 Chemical Safety Assessment
No Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Abbreviations and acronyms

<table>
<thead>
<tr>
<th>Abbr.</th>
<th>Descriptions of used abbreviations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADN</td>
<td>Accord européen relatif au transport international des marchandises dangereuses par voies de navigation intérieures (European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways)</td>
</tr>
<tr>
<td>ADR</td>
<td>Accord européen relatif au transport international des marchandises dangereuses par route (European Agreement concerning the International Carriage of Dangerous Goods by Road)</td>
</tr>
<tr>
<td>CAS</td>
<td>Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)</td>
</tr>
<tr>
<td>CLP</td>
<td>Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures</td>
</tr>
<tr>
<td>CMR</td>
<td>Carcinogenic, Mutagenic or Toxic for Reproduction</td>
</tr>
<tr>
<td>DMEL</td>
<td>Derived Minimal Effect Level</td>
</tr>
<tr>
<td>DNEL</td>
<td>Derived No-Effect Level</td>
</tr>
<tr>
<td>EH40/2005</td>
<td>EH40/2005 Workplace exposure limits, Table 1: List of approved workplace exposure limits (<a href="http://www.nationalarchives.gov.uk/doc/open-government-licence/">http://www.nationalarchives.gov.uk/doc/open-government-licence/</a>)</td>
</tr>
<tr>
<td>EINECS</td>
<td>European Inventory of Existing Commercial Chemical Substances</td>
</tr>
<tr>
<td>ELINCS</td>
<td>European List of Notified Chemical Substances</td>
</tr>
<tr>
<td>EmS</td>
<td>Emergency Schedule</td>
</tr>
<tr>
<td>GHS</td>
<td>&quot;Globally Harmonized System of Classification and Labelling of Chemicals&quot; developed by the United Nations</td>
</tr>
<tr>
<td>IMDG</td>
<td>International Maritime Dangerous Goods Code</td>
</tr>
<tr>
<td>index No</td>
<td>the Index number is the identification code given to the substance in Part 3 of Annex VI to Regulation (EC) No 1272/2008</td>
</tr>
<tr>
<td>MARPOL</td>
<td>International Convention for the Prevention of Pollution from Ships (abbr. of &quot;Marine Pollutant&quot;)</td>
</tr>
<tr>
<td>NLP</td>
<td>No-Longer Polymer</td>
</tr>
<tr>
<td>PBT</td>
<td>Persistent, Bioaccumulative and Toxic</td>
</tr>
<tr>
<td>PNEC</td>
<td>Predicted No-Effect Concentration</td>
</tr>
<tr>
<td>ppm</td>
<td>parts per million</td>
</tr>
<tr>
<td>REACH</td>
<td>Registration, Evaluation, Authorisation and Restriction of Chemicals</td>
</tr>
<tr>
<td>RID</td>
<td>Règlement concernant le transport International ferroviaire des marchandises Dangereuses (Regulations concerning the International carriage of Dangerous goods by Rail)</td>
</tr>
</tbody>
</table>
The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new made-up material.

Key literature references and sources for data
- Regulation (EC) No. 1272/2008 (CLP, EU GHS)

List of relevant phrases (code and full text as stated in chapter 2 and 3)

<table>
<thead>
<tr>
<th>Code</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>H226</td>
<td>flammable liquid and vapour</td>
</tr>
<tr>
<td>H315</td>
<td>causes skin irritation</td>
</tr>
<tr>
<td>H318</td>
<td>causes serious eye damage</td>
</tr>
<tr>
<td>H335</td>
<td>may cause respiratory irritation</td>
</tr>
<tr>
<td>H336</td>
<td>may cause drowsine or dizziness</td>
</tr>
</tbody>
</table>

Disclaimer

The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new made-up material.