SAFETY DATA SHEET

Isobutyraldehyde
10280
Version / Revision 5
Supersedes Version 4.01
Revision Date 30-Apr-2020
Issuing date 15-May-2020

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

1.1. Product identifier

Identification of the substance/preparation Isobutyraldehyde
CAS-No 78-84-2
EC No. 201-149-6

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

Use of the Substance / Preparation Intermediate.
Uses advised against None

1.3. Details of the supplier of the safety data sheet

Company/Undertaking OQ Chemicals GmbH
Rheinpromenade 4A
D-40789 Monheim
Germany

OQ Chemicals Corporation
15375 Memorial Drive
West Memorial Place I
Suite 300
Houston, TX 77079
USA

Product Information
Product Stewardship
FAX: +49 (0)208 693 2053
email: sc.psq@oq.com

1.4. Emergency telephone number

Emergency telephone number +44 (0) 1235 239 670 (UK) available 24/7
NCEC +1 202 464 2554

Local emergency telephone number
+61 2 8014 4558 (Australia)
18000 74234 (Australia toll-free number)
+64 9 929 1483 (New Zealand)
0800 446 881 (New Zealand toll-free number)
+65 3158 1195 (Sri Lanka)
007 803 011 0293 (Indonesia toll-free number)
+60 3 6207 4347 (Malaysia)
001 800 120 666 751 (Thailand toll-free number)
+65 3158 1200 (Bangladesh)
+63 2 8231 2149 (Philippines)
+84 28 4458 2388 (Vietnam)
SECTION 2: Hazards identification

Europe

2.1. Classification of the substance or mixture

This substance is classified based on Directive 1272/2008/EC and its amendments (CLP Regulation)

- Flammable liquid Category 2, H225
- Serious eye damage/eye irritation Category 2, H319

Additional information
For full text of Hazard- and EU Hazard-statements see SECTION 16.

2.2. Label elements

Labelling according to Regulation 1272/2008/EC and its amendments (CLP Regulation).

Hazard pictograms

![Hazard pictograms]

Signal word | Danger
---|---
H225: Highly flammable liquid and vapour.
H319: Causes serious eye irritation.

Hazard statements

Precautionary statements

- P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- P233: Keep container tightly closed.
- P280: Wear protective gloves/protective clothing/eye protection/face protection.
- P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or 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.
- P337 + P313: If eye irritation persists: Get medical advice/attention.
- P403 + P235: Store in a well ventilated place. Keep cool.

2.3. Other hazards

- Vapour is heavier than air and can travel considerable distance to a source of ignition and flashback
- Vapours may form explosive mixture with air
- Auto ignition on large surfaces
- Hazardous polymerisation may occur
- Polymerization is a highly exothermic reaction and may generate sufficient heat to cause thermal decomposition and/or rupture containers
Components of the product may be absorbed into the body by inhalation and ingestion

**PBT and vPvB assessment**
This substance is not considered to be persistent, bioaccumulating nor toxic (PBT), nor very persistent nor very bioaccumulating (vPvB)

**USA**

**2.1. Classification of the substance or mixture**
This substance is classified in accordance with paragraph (d) of §1910.1200 (GHS-US classification).

- Serious eye damage/eye irritation  Category 2A, H319
- Flammable liquid  Category 2, H225
- Environmental hazard  Aquatic Acute 3; H402

**OSHA Specified Hazards**
Not applicable.

**2.2. Label elements**
Labeling according to §1910.1200 (GHS-US labeling).

**Hazard symbol(s)**

![Signal word](image)

**Hazard statement**

- **H225**: Highly flammable liquid and vapor.
- **H319**: Causes serious eye irritation.
- **H402**: Harmful to aquatic life

**Precautionary statements**

**Prevention**

- P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- P233: Keep container tightly closed.
- P240: Ground and bond container and receiving equipment.
- P241: Use explosion-proof electrical/ ventilating/ lighting equipment.
- P242: Use non-sparking tools.
- P243: Take action to prevent static discharges.
- P264: Wash hands thoroughly after handling.
- P273: Avoid release to the environment.
- P280: Wear protective gloves/eye protection/face protection.

**Response**

- P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or 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.
- P337 + P313: If eye irritation persists: Get medical advice/ attention.
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Storage
P403 + P235: Store in a well ventilated place. Keep cool.

Disposal
P501: Dispose of contents/container in accordance with local regulation.

2.3. Other hazards
Vapour is heavier than air and can travel considerable distance to a source of ignition and flashback
Vapours may form explosive mixture with air
Auto ignition on large surfaces
Hazardous polymerisation may occur
Polymerization is a highly exothermic reaction and may generate sufficient heat to cause thermal decomposition and/or rupture containers
Components of the product may be absorbed into the body by inhalation and ingestion

SECTION 3: Composition / information on ingredients

3.1. Substances

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>REACH-No</th>
<th>1272/2008/EC</th>
<th>Concentration (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isobutyraldehyde</td>
<td>78-84-2</td>
<td>01-2119456807-27</td>
<td>Flam. Liq. 2; H225 Eye Irrit. 2; H319</td>
<td>&gt; 97</td>
</tr>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>-</td>
<td></td>
<td>&lt; 2,50</td>
</tr>
</tbody>
</table>

Remarks
Substance manufactured in Europe contains the following stabilizer(s): Triethanolamine.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation
Keep at rest. Aerate with fresh air. When symptoms persist or in all cases of doubt seek medical advice.

Eyes
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses. Obtain medical attention.

Skin
Wash off immediately with soap and plenty of water. When symptoms persist or in all cases of doubt seek medical advice.

Ingestion
Do not induce vomiting without medical advice. Call a physician immediately.

4.2. Most important symptoms and effects, both acute and delayed

Main symptoms
shortness of breath, abdominal pain, circulatory collapse, cough.

Special hazard
Lung oedema, Lung irritation.

4.3. Indication of any immediate medical attention and special treatment needed

General advice
Remove contaminated, soaked clothing immediately and dispose of safely. First aider needs to protect himself.

Treat symptomatically. In case of lung irritation, first treatment with cortisone spray. Symptoms may be delayed.

**SECTION 5: Firefighting measures**

5.1. Extinguishing media

**Suitable extinguishing media**
- alcohol-resistant foam, dry chemical, carbon dioxide (CO2), water spray

**Unsuitable Extinguishing Media**
- Do not use a solid water stream as it may scatter and spread fire.

5.2. Special hazards arising from the substance or mixture

Under conditions giving incomplete combustion, hazardous gases produced may consist of:
- carbon monoxide (CO)
- carbon dioxide (CO2)

Combustion gases of organic materials must in principle be graded as inhalation poisons

Vapour is heavier than air and can travel considerable distance to a source of ignition and flashback

Vapours may form explosive mixture with air

5.3. Advice for firefighters

**Special protective equipment for firefighters**
- Fire fighter protection should include a self-contained breathing apparatus (NIOSH-approved or EN 133) and full fire-fighting turn out gear.

**Precautions for firefighting**
- Cool containers / tanks with water spray. Dike and collect water used to fight fire. Water run-off and vapor cloud may be corrosive. Keep people away from and upwind of fire.

**SECTION 6: Accidental release measures**

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: For personal protective equipment see section 8. Avoid contact with skin and eyes. Avoid breathing vapors or mists. Keep people away from and upwind of spill/leak. Ensure adequate ventilation, especially in confined areas. Keep away from heat and sources of ignition.

For emergency responders: Personal protection see section 8.

6.2. Environmental precautions

Prevent further leakage or spillage. Do not discharge product into the aquatic environment without pretreatment (biological treatment plant).

6.3. Methods and material for containment and cleaning up

**Methods for containment**
- Stop the flow of material, if possible without risk. Dike spilled material, where this is possible.

**Methods for cleaning up**
- Soak up with inert absorbent material. DO NOT use combustible materials such as sawdust. Keep in suitable,
closed containers for disposal. If liquid has been spilt in large quantities clean up promptly by scoop or vacuum. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours).

6.4. Reference to other sections
For personal protective equipment see section 8.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. Provide sufficient air exchange and/or exhaust in work rooms. Refill and handle product only in closed system. Do not use compressed air for filling, discharging or handling.

Hygiene measures
When using, do not eat, drink or smoke. Take off all contaminated clothing immediately. Wash hands before breaks and immediately after handling the product.

Advice on the protection of the environment
See Section 8: Environmental exposure controls.

Incompatible products
- acids and bases
- amines
- oxidizing agents
- reducing agents

7.2. Conditions for safe storage, including any incompatibilities

Advice on protection against fire and explosion
Keep away from sources of ignition - No smoking. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours). In case of fire, emergency cooling with water spray should be available. Ground and bond containers when transferring material. Vapour is heavier than air and can travel considerable distance to a source of ignition and flashback. Vapours may form explosive mixture with air. Hazardous polymerisation may occur. Polymerization is a highly exothermic reaction and may generate sufficient heat to cause thermal decomposition and/or rupture containers.

Technical measures/Storage conditions
Keep containers tightly closed in a cool, well-ventilated place. Handle and open container with care. Handle under nitrogen, protect from moisture. Keep at temperatures between 15 and 33 °C (59 and 91 °F). Oxidization creates acids and peroxides, that may lead to corrosive damages in storage and handling equipment.

Suitable material
- stainless steel, aluminium

Unsuitable material
- mild steel

Temperature class
- T4

7.3. Specific end use(s)
SECTION 8: Exposure controls / personal protection

8.1. Control parameters

Exposure limits European Union
No exposure limits established

Exposure limits Germany
No exposure limits established.

Exposure limits United States of America
No exposure limits established regarding ACGIH, OSHA Z-1 and OSHA Z-2.

Note
For details and further information please refer to the original regulation.

8.2. Exposure controls

Appropriate Engineering controls
General or dilution ventilation is frequently insufficient as the sole means of controlling employee exposure. Local ventilation is usually preferred. Explosion-proof equipment (for example fans, switches, and grounded ducts) should be used in mechanical ventilation systems.

Personal protective equipment

General industrial hygiene practice
Avoid contact with skin, eyes and clothing. Do not breathe vapours or spray mist. Ensure that eyewash stations and safety showers are close to the workstation location.

Hygiene measures
When using, do not eat, drink or smoke. Take off all contaminated clothing immediately. Wash hands before breaks and immediately after handling the product.

Eye protection
Tightly fitting safety goggles. In addition to goggles, wear a face shield if there is a reasonable chance for splash to the face.

Hand protection
Wear protective gloves. Recommendations are listed below. Other protective material may be used, depending on the situation, if adequate degradation and permeation data is available. If other chemicals are used in conjunction with this chemical, material selection should be based on protection for all chemicals present.

<table>
<thead>
<tr>
<th>Suitable material</th>
<th>butyl-rubber</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluation</td>
<td>according to EN 374: level 3</td>
</tr>
<tr>
<td>Glove thickness</td>
<td>approx 0.3 mm</td>
</tr>
<tr>
<td>Break through time</td>
<td>approx 60 min</td>
</tr>
<tr>
<td>Suitable material</td>
<td>polyvinylchloride</td>
</tr>
<tr>
<td>Evaluation</td>
<td>Information derived from practical experience</td>
</tr>
<tr>
<td>Glove thickness</td>
<td>approx 0.8 mm</td>
</tr>
</tbody>
</table>
Skin and body protection
Impervious clothing. Wear face-shield and protective suit for abnormal processing problems.

Respiratory protection
Respirator with filter for organic vapour. Use the indicated respiratory protection if the occupational exposure limit is exceeded and/or in case of product release (dust). Equipment should conform to NIOSH, EN or other applicable national standards.

Environmental exposure controls
If possible use in closed systems. If leakage can not be prevented, the substance needs to be suck off at the emersion point, if possible without danger. Observe the exposure limits, clean exhaust air if needed. If recycling is not practicable, dispose of in compliance with local regulations. Inform the responsible authorities in case of leakage into the atmosphere, or of entry into waterways, soil or drains.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>liquid</td>
</tr>
<tr>
<td>Colour</td>
<td>colourless</td>
</tr>
<tr>
<td>Odour</td>
<td>pungent</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>0,2 mg/m³</td>
</tr>
<tr>
<td>pH</td>
<td>No data available</td>
</tr>
<tr>
<td>Melting point/range</td>
<td>-69,5 °C</td>
</tr>
<tr>
<td>Boiling point/range</td>
<td>64 °C @ 1013 hPa</td>
</tr>
<tr>
<td>Flash point</td>
<td>-5 °C</td>
</tr>
<tr>
<td>Method</td>
<td>DIN 51755</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>9,6 (n-Butyl acetate = 1)</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Does not apply, the substance is a liquid</td>
</tr>
<tr>
<td>Lower explosion limit</td>
<td>1,6 Vol %</td>
</tr>
<tr>
<td>Upper explosion limit</td>
<td>10,6 Vol %</td>
</tr>
</tbody>
</table>

| Vapour pressure                  |                      |
| Values [hPa]                     | Values [kPa]          | Values [atm] | @ °C | @ °F | Method |
| 153                              | 15,3                  | 0,151        | 20   | 68   |        |
| 230                              | 23                    | 0,227        | 25   | 77   |        |
| Vapour density                   | 2,5 (Air = 1) @ 20 °C (68 °F) |

| Relative density                 |                      |
| Values                           | @ °C                 | @ °F | Method |
| 0,783                            | 20                    | 68   | DIN 51757 |
| Solubility                       | 60 g/l @ 25 °C, in water |
| log Pow                          | 0,77 (measured), OECD 107 |
| Autoignition temperature         | 180 °C                |
| Method                           | ASTM E 659            |
| Decomposition temperature        | No data available     |
| Viscosity                        | 0,43 mPa*s @ 20 °C    |
| Method                           | ISO 3219              |
| Oxidizing properties             | Does not apply, substance is not oxidising. There are no chemical groups associated with oxidizing properties |
| Explosive properties             | Does not apply, substance is not explosive. There are no chemical groups associated with explosive properties |

9.2. Other information
Molecular weight 72.11
Molecular formula C4 H8 O
Refractive index 1.373 @ 20 °C
Heat of combustion 600 kcal/kg

SECTION 10: Stability and Reactivity

10.1. Reactivity
The reactivity of the product corresponds to the typical reactivity shown by the substance group as described in any text book on organic chemistry.

10.2. Chemical stability
Stable under recommended storage conditions. Stable up to approximately 49 °C.

10.3. Possibility of hazardous reactions
Hazardous polymerisation may occur. Polymerization is a highly exothermic reaction and may generate sufficient heat to cause thermal decomposition and/or rupture containers. May form explosive peroxides. When finely distributed, self-ignition is possible. Vapours may form explosive mixture with air.

10.4. Conditions to avoid
Avoid contact with heat, sparks, open flame and static discharge. Avoid any source of ignition.

10.5. Incompatible materials
bases, amines, acids, oxidizing agents, reducing agents.

10.6. Hazardous decomposition products
No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

<table>
<thead>
<tr>
<th>Likely routes of exposure</th>
<th>Ingestion, Inhalation, Eye contact, Skin contact</th>
</tr>
</thead>
</table>

**Acute toxicity**

<table>
<thead>
<tr>
<th>Isobutyraldehyde (78-84-2)</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Routes of Exposure</td>
<td>Endpoint</td>
<td>Values</td>
<td>Species</td>
<td>Method</td>
</tr>
<tr>
<td>Oral</td>
<td>LD50</td>
<td>3730 mg/kg</td>
<td>rat</td>
<td></td>
</tr>
<tr>
<td>Dermal</td>
<td>LD50</td>
<td>5630 mg/kg</td>
<td>rabbit</td>
<td>Draize Test</td>
</tr>
<tr>
<td>Inhalative</td>
<td>LC50</td>
<td>&gt; 4.6 mg/l (4h)</td>
<td>rat, male/female</td>
<td>read across</td>
</tr>
</tbody>
</table>

**Isobutyraldehyde, CAS: 78-84-2**

**Assessment**
Based on available data, the classification criteria are not met for:
Acute oral toxicity
Acute dermal toxicity
Acute inhalation toxicity
**STOT SE**

<table>
<thead>
<tr>
<th><strong>Irritation and corrosion</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Isobutyraldehyde (78-84-2)</strong></td>
</tr>
<tr>
<td><strong>Target Organ Effects</strong></td>
</tr>
<tr>
<td>Skin</td>
</tr>
<tr>
<td>Eyes</td>
</tr>
</tbody>
</table>

**Isobutyraldehyde, CAS: 78-84-2**

**Assessment**
The available data lead to the classification given in section 2
For respiratory irritation, no data are available

<table>
<thead>
<tr>
<th><strong>Sensitization</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Isobutyraldehyde (78-84-2)</strong></td>
</tr>
<tr>
<td><strong>Target Organ Effects</strong></td>
</tr>
<tr>
<td>Skin</td>
</tr>
</tbody>
</table>

**Isobutyraldehyde, CAS: 78-84-2**

**Assessment**
Based on available data, the classification criteria are not met for:
Skin sensitization
For respiratory sensitization, no data are available

<table>
<thead>
<tr>
<th><strong>Subacute, subchronic and prolonged toxicity</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Isobutyraldehyde (78-84-2)</strong></td>
</tr>
<tr>
<td><strong>Type</strong></td>
</tr>
<tr>
<td>Subchronic toxicity</td>
</tr>
<tr>
<td>Subchronic toxicity</td>
</tr>
<tr>
<td>Subchronic toxicity</td>
</tr>
<tr>
<td>Subchronic toxicity</td>
</tr>
</tbody>
</table>

**Isobutyraldehyde, CAS: 78-84-2**

**Assessment**
Based on available data, the classification criteria are not met for:
STOT RE

<table>
<thead>
<tr>
<th><strong>Carcinogenicity, Mutagenicity, Reproductive toxicity</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Isobutyraldehyde (78-84-2)</strong></td>
</tr>
<tr>
<td><strong>Type</strong></td>
</tr>
<tr>
<td>Mutagenicity</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Mutagenicity</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Mutagenicity</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Mutagenicity</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>Mutagenicity</th>
<th>rat</th>
<th>negative</th>
<th>Aberration</th>
<th>Bone marrow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carcinogenicity</td>
<td>LOAEC: 500 ppm</td>
<td>rat, male/female</td>
<td>Chromosomal Aberration</td>
<td>Maternal toxicity</td>
</tr>
<tr>
<td>Reproductive toxicity</td>
<td>NOAEC: 2000 ppm</td>
<td>rat, male/female</td>
<td>OECD 413</td>
<td></td>
</tr>
<tr>
<td>Developmental Toxicity</td>
<td>NOAEL 3 mg/l</td>
<td>rat</td>
<td>OECD 414, Inhalative</td>
<td>Maternal toxicity</td>
</tr>
<tr>
<td>Developmental Toxicity</td>
<td>NOAEL 12 mg/l</td>
<td>rat</td>
<td>OECD 414, Inhalative</td>
<td>Teratogenicity</td>
</tr>
</tbody>
</table>

**Isobutyraldehyde, CAS: 78-84-2**

**CMR Classification**
The available data on CMR properties are summarized in the table above. They do not indicate a classification into categories 1A or 1B.

**Evaluation**
In vitro tests did not show mutagenic effects.

**Isobutyraldehyde, CAS: 78-84-2**

**Main symptoms**
shortness of breath, abdominal pain, circulatory collapse, cough.

**Target Organ Systemic Toxicant - Single exposure**
Based on available data, the classification criteria are not met for:
STOT SE

**Target Organ Systemic Toxicant - Repeated exposure**
Based on available data, the classification criteria are not met for:
STOT RE

**Other adverse effects**
Components of the product may be absorbed into the body by inhalation and ingestion.

**Note**
Handle in accordance with good industrial hygiene and safety practice. Further details on substance data can be found in the registration dossier under the following link: http://echa.europa.eu/information-on-chemicals/registered-substances.

**SECTION 12: Ecological information**

12.1. Toxicity

**Acute aquatic toxicity**

<table>
<thead>
<tr>
<th>Species</th>
<th>Exposure time</th>
<th>Dose</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daphnia magna (Water flea)</td>
<td>48h</td>
<td>EC50: 277 mg/l</td>
<td>79/831/EEC.C2</td>
</tr>
<tr>
<td>Desmodesmus subspicatus</td>
<td>72h</td>
<td>EC50: 84 mg/l (Growth rate)</td>
<td>DIN 38412, part 9</td>
</tr>
<tr>
<td>Pimephales promelas (fathead minnow)</td>
<td>96h</td>
<td>LC50: 23 mg/l</td>
<td></td>
</tr>
<tr>
<td>Pseudomonas putida</td>
<td>17 h</td>
<td>EC50: 468 mg/l</td>
<td>DIN 38412, part 8</td>
</tr>
</tbody>
</table>

12.2. Persistence and degradability

**Isobutyraldehyde, CAS: 78-84-2**

**Biodegradation**
80 - 90 % (14 d), BOD, activated sludge, aerobic, OECD 301 C.
12.3. Bioaccumulative potential

<table>
<thead>
<tr>
<th>Isobutyraldehyde (78-84-2)</th>
<th>Type</th>
<th>Result</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>log Pow</td>
<td>0.77</td>
<td>OECD 107</td>
</tr>
</tbody>
</table>

12.4. Mobility in soil

Isobutyraldehyde, CAS: 78-84-2
No data available

12.5. Results of PBT and vPvB assessment

Isobutyraldehyde, CAS: 78-84-2
PBT and vPvB assessment
This substance is not considered to be persistent, bioaccumulating nor toxic (PBT), nor very persistent nor very bioaccumulating (vPvB)

12.6. Other adverse effects

Isobutyraldehyde, CAS: 78-84-2
No data available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product Information
Disposal required in compliance with all waste management related state and local regulations. The choice of the appropriate method of disposal depends on the product composition by the time of disposal as well as the local statutes and possibilities for disposal.
Hazardous waste according to European Waste Catalogue (EWC)

Uncleaned empty packaging
Contaminated packaging should be emptied as far as possible and after appropriate cleansing may be taken for reuse.

SECTION 14: Transport information

ICAO-TI / IATA-DGR

14.1. UN number
UN 2045

14.2. UN proper shipping name
Isobutyraldehyde

14.3. Transport hazard class(es)
3

14.4. Packing group
II

14.5. Environmental hazards
no

14.6. Special precautions for user
no data available
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IMDG

14.1. UN number UN 2045
14.2. UN proper shipping name Isobutyraldehyde
14.3. Transport hazard class(es) 3
14.4. Packing group II
14.5. Environmental hazards no
14.6. Special precautions for user EmS F-E, S-D

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

Product name Butyraldehyde
Ship type 3
Pollution category Y

ADR/RID

14.1. UN number UN 2045
14.2. UN proper shipping name Isobutyraldehyde
14.3. Transport hazard class(es) 3
14.4. Packing group II
14.5. Environmental hazards no
14.6. Special precautions for user ADR Tunnel restriction code (D/E) Classification Code F1 Hazard Number 33

SECTION 15: Regulatory information

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

DI 2012/18/EU (Seveso III) Category Annex I, part 1: P5a - c; depending on conditions

DI 1999/13/EC (VOC Guideline)

<table>
<thead>
<tr>
<th>Component</th>
<th>Status</th>
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<tbody>
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<td>Isobutyraldehyde</td>
<td>regulated</td>
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<tr>
<td>CAS: 78-84-2</td>
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</tr>
</tbody>
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International Inventories

Isobutyraldehyde, CAS: 78-84-2
SAFETY DATA SHEET

Isobutyraldehyde
10280

SECTION 16: Other information

Full text of H-Statements referred to under sections 2 and 3
H225: Highly flammable liquid and vapour.
H319: Causes serious eye irritation.

Abbreviations
A table of terms and abbreviations can be found under the following link:

Training advice
For effective first-aid, special training / education is needed.

Sources of key data used to compile the datasheet
Information contained in this safety data sheet is based on OQ owned data and public sources deemed valid or acceptable. The absence of data elements required by OSHA, ANSI or Annex II, Regulation 1907/2006/EC indicates, that no data meeting these requirements is available.

Further information for the safety data sheet
Changes against the previous version are marked by ***. Observe national and local legal requirements. For more information, other material safety data sheets or technical data sheets please consult the OQ homepage (www.chemicals.oq.com).
The annex is not required because the substance is registered as an intermediate under REACh.

Disclaimer
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End of Safety Data Sheet