

2-Ethylbutyryl chloride, 99%

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830
Date of issue: 4/9/2019 Version: 1.0

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

1.1. Product identifier

| | |
|----------------|--|
| Product form | : Substance |
| Substance name | : 2-Ethylbutyryl chloride, 99% |
| IUPAC name | : 2-ethylbutanoyl chloride |
| EC-No. | : 220-359-9 |
| CAS-No. | : 2736-40-5 |
| Product code | : 90028332 |
| Formula | : (CH ₃ CH ₂) ₂ CHCOCl |
| Product group | : Raw material |

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

1.2.1. Relevant identified uses

| | |
|----------------------------------|--|
| Main use category | : Laboratory use, Industrial use, Professional use |
| Industrial/Professional use spec | : For professional use only |

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Supplier

Safell Organics
Molekula Ltd
Lingfield Way
Darlington - England
T +44 (0) 1949 823777 / +44 (0) 7590 545705
info@molekula.com / kbowen@molekula.com - www.molekula.com

1.4. Emergency telephone number

Emergency number : +44 (0) 7590 545705

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

| | |
|--|------|
| Flammable liquids, Category 3 | H226 |
| Skin corrosion/irritation, Category 1 | H314 |
| Full text of H statements : see section 16 | |

Adverse physicochemical, human health and environmental effects

No additional information available

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP)



GHS02

GHS05

Signal word (CLP)

: Danger

Hazard statements (CLP)

: H226 - Flammable liquid and vapour.
H314 - Causes severe skin burns and eye damage.

Precautionary statements (CLP)

: P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P220 - Keep away from clothing and other combustible materials.
P280 - Wear protective clothing, eye protection, face protection, protective gloves.
P302+P352 - IF ON SKIN: Wash with plenty of soap and water.
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

2.3. Other hazards

This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII

This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

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SECTION 3: Composition/information on ingredients

3.1. Substances

| Name | Product identifier | % |
|------------------------------|---|-----|
| 2-Ethylbutyryl chloride, 99% | (CAS-No.) 2736-40-5 (EC-No.) 220-359-9 | 100 |

Full text of H-statements: see section 16

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

| | |
|---------------------------------------|---|
| First-aid measures general | : If possible show this sheet, if not available show packaging or label. Never give anything by mouth to an unconscious person. Do not leave affected person unattended. |
| First-aid measures after inhalation | : If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. Give oxygen or artificial respiration if necessary. If breathing difficulties persist : Get medical advice/attention. |
| First-aid measures after skin contact | : After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Do not remove clothing if it sticks to the skin. If irritation persists, consult a doctor. |
| First-aid measures after eye contact | : Rinse immediately with plenty of water. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. |
| First-aid measures after ingestion | : Rinse mouth out with water. Do not induce vomiting. Get medical advice/attention. |

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

| | |
|-------------------------------------|--|
| Symptoms/effects after inhalation | : Material is destructive to tissue of the mucuous membranes and upper respiratory tract. Cough, shortness of breath, headache, nausea. Burns or irritation of the linings of the mouth, throat, and gastrointestinal tract. |
| Symptoms/effects after skin contact | : May produce skin irritation, blistering, ulcers, and deep scarring. Causes severe burns. |
| Symptoms/effects after eye contact | : redness, itching, tears. Direct contact may result in corneal injury. Causes serious eye burns. |
| Symptoms/effects after ingestion | : Symptoms of ingestion include drowsiness, weakness, headache, dizziness, nausea, vomiting. Burns or irritation of the linings of the mouth, throat, and gastrointestinal tract. |

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

Get immediate medical advice/attention.

SECTION 5: Firefighting measures

5.1. Extinguishing media

| | |
|--------------------------------|-------------------------|
| Suitable extinguishing media | : Dry powder. Sand. |
| Unsuitable extinguishing media | : Do NOT use water jet. |

5.2. Special hazards arising from the substance or mixture

| | |
|--|--|
| Fire hazard | : Flammable liquid and vapour. |
| Explosion hazard | : May form flammable/explosive vapour-air mixture. |
| Hazardous decomposition products in case of fire | : Carbon oxides (CO, CO2). Hydrogen chloride gas. |

5.3. Advice for firefighters

| | |
|--------------------------------|---|
| Precautionary measures fire | : Keep container tightly closed and away from heat, sparks and flame. Keep away from combustible materials. |
| Firefighting instructions | : Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent fire fighting water from entering the environment. |
| Protection during firefighting | : Wear recommended personal protective equipment. Use self-contained breathing apparatus and chemically protective clothing. |
| Other information | : Warn all persons of toxic hazard. |

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

| | |
|------------------|--|
| General measures | : Do not handle until all safety precautions have been read and understood. Ventilate the area thoroughly, especially low lying areas (basements, workpits etc). Keep away from combustible materials. |
|------------------|--|

6.1.1. For non-emergency personnel

| | |
|----------------------------------|--|
| Protective equipment | : Wear recommended personal protective equipment. |
| Emergency procedures | : Evacuate unnecessary personnel. Mark out the contaminated area with signs and prevent access to unauthorized personnel. Do not touch or walk on the spilled product. Avoid contact with skin, eyes and clothing. |
| Measures in case of dust release | : Shelter from vapours by keeping upwind. Ventilate the area thoroughly, especially low lying areas (basements, workpits etc). Special attention should be given to low areas/pits where flammable vapours can accumulate. |

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6.1.2. For emergency responders

- Protective equipment : Do not attempt to take action without suitable protective equipment. Use self-contained breathing apparatus and chemically protective clothing.
- Emergency procedures : Ventilate area.

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

- For containment : Collect spillage. Contain the spilled material by bunding.
- Methods for cleaning up : Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Try to stop release if without risk.

6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Additional hazards when processed : Handle empty containers with care because residual vapours are flammable.
- Precautions for safe handling : Avoid formation of vapours. Avoid contact with skin, eyes and clothing. Do not handle until all safety precautions have been read and understood. Ensure that there is a suitable ventilation system. Do not handle in a confined space.
- Hygiene measures : Take off immediately all contaminated clothing and wash it before reuse. Contaminated work clothing should not be allowed out of the workplace. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Do not eat, drink or smoke when using this product.

7.2. Conditions for safe storage, including any incompatibilities

- Technical measures : Ensure adequate ventilation, especially in confined areas. Proper grounding procedures to avoid static electricity should be followed.
- Storage conditions : Keep only in the original container in a cool, well ventilated place away from : Heat sources, Direct sunlight. Keep container closed when not in use. Store contents under inert gas.
- Incompatible products : Strong oxidisers. alcohols. Strong bases.
- Incompatible materials : Sources of ignition. Direct sunlight. Heat sources. open flames. sparks.
- Heat and ignition sources : Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- Storage area : Keep away from combustible materials. Store below 20 °C. Store in a dry place. Store in a closed container.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

No additional information available

8.2. Exposure controls

Appropriate engineering controls:

Handle in accordance with good industrial hygiene and safety procedures. Floors should be impervious, resistant to liquids and easy to clean.

Personal protective equipment:

Avoid all unnecessary exposure.

Hand protection:

The protective gloves to be used must comply with the specifications of the regulation 2016/425 and the resultant standard EN 374

| Type | Material | Permeation | Thickness (mm) | Penetration | Standard |
|-------------------|-----------------------|-------------------|----------------|-------------|----------|
| Disposable gloves | Fluoroelastomer (FKM) | 6 (> 480 minutes) | 0.7 | | EN 374 |

Eye protection:

Emergency eye wash fountains should be available in the immediate vicinity of any potential exposure. Use eye protection according to EN 166, designed to protect against liquid splashes.

| Type | Use | Characteristics | Standard |
|-----------------------------|------------------|---|----------|
| Safety goggles, Face shield | Droplet, vapours | tightly fitting safety goggles, With side shields | EN 166 |

Skin and body protection:

Emergency safety showers should be available in the immediate vicinity of any potential exposure. Keep suitable chemically resistant protective clothing readily available for emergency use

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| Type | Standard | | |
|--|-------------|---|----------|
| Total impervious protective suits, gloves, and boots must be worn to prevent any contact with the product, Flame retardant antistatic protective clothing | EN 14605 | | |
| Respiratory protection: | | | |
| Keep self contained breathing apparatus readily available for emergency use. Where exposure through inhalation may occur from use, respiratory protection equipment is recommended | | | |
| Device | Filter type | Condition | Standard |
| Air-Purifying Respirator (APR), reusable | ABEK | Moist condition, Mist formation, Protection for Liquid particles, Vapour protection | EN 14387 |

Other information:

Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

| | |
|--|------------------------|
| Physical state | : Liquid |
| Appearance | : Clear. |
| Molecular mass | : 134.6 g/mol |
| Colour | : Colourless. |
| Odour | : No data available. |
| Odour threshold | : No data available |
| pH | : No data available |
| Relative evaporation rate (butylacetate=1) | : No data available |
| Melting point | : No data available |
| Freezing point | : No data available |
| Boiling point | : 137 - 139 °C lit. |
| Flash point | : 35 °C closed cup. |
| Auto-ignition temperature | : No data available |
| Decomposition temperature | : No data available |
| Flammability (solid, gas) | : Flammable |
| Vapour pressure | : No data available |
| Relative vapour density at 20 °C | : No data available |
| Relative density | : 0.982 g/cm3 at 25 °C |
| Solubility | : No data available |
| Log Pow | : No data available |
| Viscosity, kinematic | : No data available |
| Viscosity, dynamic | : No data available |
| Explosive properties | : No data available |
| Oxidising properties | : No data available |
| Explosive limits | : No data available |

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Flammable liquid and vapour.

10.2. Chemical stability

Flammable liquid and vapour. May form flammable/explosive vapour-air mixture.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid

Protect from sunlight. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

10.5. Incompatible materials

Strong oxidizers. Strong bases. alcohols.

10.6. Hazardous decomposition products

No hazardous decomposition products known at room temperature. Thermal decomposition generates : Carbon oxides (CO, CO2). Hydrogen chloride gas.

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SECTION 11: Toxicological information

11.1. Information on toxicological effects

| | |
|---|---|
| Acute toxicity (oral) | : Not classified |
| Acute toxicity (dermal) | : Not classified |
| Acute toxicity (inhalation) | : Not classified |
| Skin corrosion/irritation | : Causes severe skin burns and eye damage. |
| Additional information | : Based on available data, the classification criteria are not met |
| Serious eye damage/irritation | : Serious eye damage, category 1, implicit |
| Additional information | : Based on available data, the classification criteria are not met |
| Respiratory or skin sensitisation | : Not classified |
| Additional information | : Based on available data, the classification criteria are not met |
| Germ cell mutagenicity | : Not classified |
| Additional information | : Based on available data, the classification criteria are not met |
| Carcinogenicity | : Not classified |
| Additional information | : Based on available data, the classification criteria are not met |
| Reproductive toxicity | : Not classified |
| Additional information | : Based on available data, the classification criteria are not met |
| STOT-single exposure | : Not classified |
| Additional information | : Based on available data, the classification criteria are not met |
| STOT-repeated exposure | : Not classified |
| Additional information | : Based on available data, the classification criteria are not met |
| Aspiration hazard | : Not classified |
| Additional information | : Based on available data, the classification criteria are not met |
| Potential adverse human health effects and symptoms | : Based on available data, the classification criteria are not met. |

SECTION 12: Ecological information

12.1. Toxicity

| | |
|--------------------------|------------------|
| Acute aquatic toxicity | : Not classified |
| Chronic aquatic toxicity | : Not classified |

12.2. Persistence and degradability

2-Ethylbutyryl chloride, 99% (2736-40-5)

| | |
|-------------------------------|--------------------|
| Persistence and degradability | No data available. |
|-------------------------------|--------------------|

12.3. Bioaccumulative potential

2-Ethylbutyryl chloride, 99% (2736-40-5)

| | |
|---------------------------|--------------------|
| Bioaccumulative potential | No data available. |
|---------------------------|--------------------|

12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

2-Ethylbutyryl chloride, 99% (2736-40-5)

This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII

This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

12.6. Other adverse effects

| | |
|------------------------|-------------------------------------|
| Additional information | : Avoid release to the environment. |
|------------------------|-------------------------------------|

SECTION 13: Disposal considerations

13.1. Waste treatment methods

| | |
|--|---|
| Product/Packaging disposal recommendations | : Dispose in a safe manner in accordance with local/national regulations. |
| Additional information | : Handle empty containers with care because residual vapours are flammable. |
| Ecology - waste materials | : Avoid release to the environment. |






SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

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| ADR | IMDG | IATA | ADN | RID |
|--|---|---|---|---|
| 14.1. UN number | | | | |
| 2920 | 2920 | 2920 | 2920 | 2920 |
| 14.2. UN proper shipping name | | | | |
| CORROSIVE LIQUID, FLAMMABLE, N.O.S. | CORROSIVE LIQUID, FLAMMABLE, N.O.S. | Corrosive liquid, flammable, n.o.s. | CORROSIVE LIQUID, FLAMMABLE, N.O.S. | CORROSIVE LIQUID, FLAMMABLE, N.O.S. |
| Transport document description | | | | |
| UN 2920 CORROSIVE LIQUID, FLAMMABLE, N.O.S. (2-Ethylbutyryl chloride, 99%), 8 (3), II, (D/E) | UN 2920 CORROSIVE LIQUID, FLAMMABLE, N.O.S. (2-Ethylbutyryl chloride, 99%), 8 (3), II | UN 2920 Corrosive liquid, flammable, n.o.s. (2-Ethylbutyryl chloride, 99%), 8 (3), II | UN 2920 CORROSIVE LIQUID, FLAMMABLE, N.O.S. (2-Ethylbutyryl chloride, 99%), 8 (3), II | UN 2920 CORROSIVE LIQUID, FLAMMABLE, N.O.S. (2-Ethylbutyryl chloride, 99%), 8 (3), II |
| 14.3. Transport hazard class(es) | | | | |
| 8 (3) | 8 (3) | 8 (3) | 8 (3) | 8 (3) |
|  |  |  |  |  |
| 14.4. Packing group | | | | |
| II | II | II | II | II |
| 14.5. Environmental hazards | | | | |
| Dangerous for the environment : No | Dangerous for the environment : No Marine pollutant : No | Dangerous for the environment : No | Dangerous for the environment : No | Dangerous for the environment : No |
| No supplementary information available | | | | |
| 14.6. Special precautions for user | | | | |

Overland transport

| | |
|---|---------------|
| Classification code (ADR) | : CF1 |
| Special provisions (ADR) | : 274 |
| Limited quantities (ADR) | : 1I |
| Excepted quantities (ADR) | : E2 |
| Packing instructions (ADR) | : P001, IBC02 |
| Mixed packing provisions (ADR) | : MP15 |
| Portable tank and bulk container instructions (ADR) | : T11 |
| Portable tank and bulk container special provisions (ADR) | : TP2, TP27 |
| Tank code (ADR) | : L4BN |
| Vehicle for tank carriage | : FL |
| Transport category (ADR) | : 2 |
| Special provisions for carriage - Operation (ADR) | : S2 |
| Hazard identification number (Kemler No.) | : 83 |
| Orange plates | : |



| | |
|-------------------------------|---------|
| Tunnel restriction code (ADR) | : D/E |
| EAC code | : •3W |
| APP code | : A(fl) |

Transport by sea

| | |
|---------------------------------|-------------|
| Special provisions (IMDG) | : 274 |
| Packing instructions (IMDG) | : P001 |
| IBC packing instructions (IMDG) | : IBC02 |
| Tank instructions (IMDG) | : T11 |
| Tank special provisions (IMDG) | : TP2, TP27 |

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| | |
|------------------------------------|--|
| EmS-No. (Fire) | : F-E |
| EmS-No. (Spillage) | : S-C |
| Stowage category (IMDG) | : C |
| Stowage and handling (IMDG) | : SW1, SW2 |
| Properties and observations (IMDG) | : Causes burns to skin, eyes and mucous membranes. |

Air transport

| | |
|--|--------|
| PCA Excepted quantities (IATA) | : E2 |
| PCA Limited quantities (IATA) | : Y840 |
| PCA limited quantity max net quantity (IATA) | : 0.5L |
| PCA packing instructions (IATA) | : 851 |
| PCA max net quantity (IATA) | : 1L |
| CAO packing instructions (IATA) | : 855 |
| CAO max net quantity (IATA) | : 30L |
| ERG code (IATA) | : 8F |

Inland waterway transport

| | |
|-----------------------------------|-----------------|
| Classification code (ADN) | : CF1 |
| Special provisions (ADN) | : 274 |
| Limited quantities (ADN) | : 1 L |
| Excepted quantities (ADN) | : E2 |
| Carriage permitted (ADN) | : T |
| Equipment required (ADN) | : PP, EP, EX, A |
| Ventilation (ADN) | : VE01 |
| Number of blue cones/lights (ADN) | : 1 |

Rail transport

| | |
|---|---------------|
| Classification code (RID) | : CF1 |
| Special provisions (RID) | : 274 |
| Limited quantities (RID) | : 1L |
| Excepted quantities (RID) | : E2 |
| Packing instructions (RID) | : P001, IBC02 |
| Mixed packing provisions (RID) | : MP15 |
| Portable tank and bulk container instructions (RID) | : T11 |
| Portable tank and bulk container special provisions (RID) | : TP2, TP27 |
| Tank codes for RID tanks (RID) | : L4BN |
| Transport category (RID) | : 2 |
| Colis express (express parcels) (RID) | : CE6 |
| Hazard identification number (RID) | : 83 |

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

Not applicable

SECTION 15: Regulatory information

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

15.1.1. EU-Regulations

No REACH Annex XVII restrictions

2-Ethylbutyryl chloride, 99% is not on the REACH Candidate List

Directive 2012/18/EU (SEVESO III)

15.1.2. National regulations

Germany

12th Ordinance Implementing the Federal Immission Control Act - 12.BImSchV : Is not subject of the 12. BImSchV (Hazardous Incident Ordinance)

Netherlands

| | |
|---|-------------------------------|
| SZW-lijst van kankerverwekkende stoffen | : The substance is not listed |
| SZW-lijst van mutagene stoffen | : The substance is not listed |
| NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Borstvoeding | : The substance is not listed |
| NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Vruchtbaarheid | : The substance is not listed |

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NIET-limitatieve lijst van voor de voortplanting
giftige stoffen – Ontwikkeling : The substance is not listed

Denmark

Class for fire hazard : Class II-1

Store unit : 5 liter

Classification remarks : R10 <H226;H314>; Emergency management guidelines for the storage of flammable liquids must be followed

Danish National Regulations : Young people below the age of 18 years are not allowed to use the product

15.2. Chemical safety assessment

No chemical safety assessment has been carried out for the substance or the mixture by the supplier

SECTION 16: Other information

Data sources : REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.

Other information : None.

| Full text of H- and EUH-statements: | |
|-------------------------------------|--|
| Flam. Liq. 3 | Flammable liquids, Category 3 |
| Skin Corr. 1 | Skin corrosion/irritation, Category 1 |
| H226 | Flammable liquid and vapour. |
| H314 | Causes severe skin burns and eye damage. |

SDS EU (REACH Annex II)

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.