1. Product and company identification

Trade Name

n-Butyric anhydride

Manufacturer, importer, supplier
Celanese Sales Germany GmbH
Am Unisys-Park 1
65843 Sulzbach (Taunus)
Germany

Transportation emergency phone numbers:
In USA, call  800 424 9300
Outside USA, call  +001 703 527 3887, collect calls accepted.
In Mexico, call  01-800-681-9531

Identified uses
Chemical intermediate

2. Hazard Identification

GHS Classification

<table>
<thead>
<tr>
<th>Hazards</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammable liquid</td>
<td>Category 4</td>
</tr>
<tr>
<td>Acute oral toxicity</td>
<td>Category 4</td>
</tr>
<tr>
<td>Skin corrosion/irritation</td>
<td>Category 1B</td>
</tr>
<tr>
<td>Serious eye damage/eye irritation</td>
<td>Category 2A</td>
</tr>
</tbody>
</table>

Label elements

Signal Word
Danger

Hazard Statements
Combustible liquid
Harmful if swallowed
Causes severe skin burns and eye damage
Causes serious eye irritation
Precautionary statements
Keep away from flames and hot surfaces - No smoking
In case of fire:
Use foam, dry chemical, carbon dioxide (CO2) to extinguish.
Wear protective gloves/ protective clothing/ eye protection/ face protection.
Wash face, hands and any exposed skin thoroughly after handling.
Do not eat, drink or smoke when using this product.
Do not breathe dusts or mists
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
Call a POISON CENTER or doctor if you feel unwell.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
Wash contaminated clothing before reuse.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
Immediately call a POISON CENTER or doctor.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/attention.
Store locked up.
Store in a well-ventilated place. Keep cool.
Dispose of contents/ container to an approved waste disposal plant.

3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No</th>
<th>Percent %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butyric anhydride</td>
<td>106-31-0</td>
<td>min 98</td>
</tr>
<tr>
<td>n-Butyric acid</td>
<td>107-92-6</td>
<td>max 2</td>
</tr>
</tbody>
</table>

4. First aid measures

General Information
Remove contaminated, soaked clothing immediately and dispose of safely. Pay attention to own protection. In any case show the physician the Safety Data Sheet.

Skin
Wash off immediately with plenty of water for at least 15 minutes. Obtain medical attention.

Eyes
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Call a physician immediately.

Inhalation
Keep at rest. Move to fresh air. Call a physician immediately.

Ingestion
If conscious, drink plenty of water. If swallowed, do not induce vomiting - seek medical advice.
5. Fire-fighting measures

Suitable extinguishing media
Foam, Dry chemical, Carbon dioxide (CO2)

Extinguishing media which must not be used for safety reasons
Do not use a solid water stream as it may scatter and spread fire.

Special exposure hazards arising from the substance or preparation itself, its combustion products, or released gases
Under conditions giving incomplete combustion, hazardous gases produced may consist of Carbon monoxide Carbon dioxide (CO2) Combustion gases of organic materials must in principle be graded as inhalation poisons

Special protective equipment for fire-fighters
self-contained breathing apparatus (EN 133).

Environmental precautions
Dike and collect water used to fight fire.

Other Information
Cool containers / tanks with water spray.

6. Accidental release measures

Personal precautions
Avoid contact with the skin and the eyes. Keep away from heat and sources of ignition. Provide adequate ventilation.

Environmental precautions
Prevent further leakage or spillage. Do not discharge into the drains/surface waters/groundwater. Dike and collect water used to fight fire.

Methods for cleaning up
Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal. Dispose of in accordance with local regulations.

Authority Notification
Within the United States, call the National Response Center (800-424-8802) and appropriate state and local authorities if the quantity released over 24 hours is equal to or greater than the reportable quantity listed below:

Butyric acid - 5000 lb/ 2268 kg

7. Handling and storage

Advice on safe handling
Provide sufficient air exchange and/or exhaust in work rooms.
Protection - fire and explosion:
Keep away from sources of ignition - No smoking. Take necessary action to avoid static electricity discharge. Ground and bond containers when transferring material. In case of fire, emergency cooling with water spray should be available.

Technical measures/Storage conditions
Keep tightly closed in a dry, cool and well-ventilated place. Keep container tightly closed. Never allow product to get in contact with water during storage.

Material storage
Store locked up. Keep in a dry, cool and well-ventilated place.

Incompatible products
Keep away from:, Bases, Amines, Alcohols, water

8. Exposure controls / personal protection

OSHA Exposure Limits
No exposure limits established.

ACGIH Exposure Limits
No exposure limits established.

Mexico National Exposure Limits
No exposure limits established

Exposure controls

Engineering measures
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.

Protective equipment
A safety shower and eyewash should be readily available.

General advice
Avoid contact with skin and eyes. Do not breathe vapors or spray mist. Use only in an area equipped with a safety shower. Hold eye wash fountain available.

9. Physical and chemical properties

Appearance
Form liquid
9. Physical and chemical properties

**Color**  
colourless

**Odor**  
pungent

**Molecular Weight**  
158.19

**Flash point**  
88°C (190.4°F)

**Method**  
closed cup

**Ignition temperature**  
279°C (534.2°F)

**Lower explosion limit**  
0.9 Vol. %

**Upper explosion limit**  
5.8 Vol. % (-103°F)

**Boiling point/range**  
198°C (388.4°F) @ 1013 hPa

**Density**  
0.966 - 0.967 g/ml @ 20°C

**pH**  
5.4

**Vapor pressure**  
0.4 hPa @ 20°C

**Vapor density**  
5.4 (Air=1)

**Water solubility**  
hydrolyses

**Partition coefficient**  
1.39 (calculated)

(n-octanol/water)

10. Stability and reactivity

**Reactivity**  
Stable under normal conditions of handling, use and transportation.

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

**Incompatible Materials**  
Keep away from:
Amines
Bases
Alcohols

**Possibility of hazardous reactions**  
Reacts violently with water, alkalies, alcohols.
11. Toxicological information

Potential health effects

Routes of exposure

Skin, eyes, inhalation, ingestion.

Immediate effects

Skin
Causes skin burns. Symptoms of overexposure include: Redness or discoloration, swelling, itching, burning or blistering of skin.

Eyes
Causes eye burns. Symptoms of exposure may include: Eye irritation, burning sensation, pain, watering, and/or change of vision. Loss of vision.

Inhalation
Causes respiratory tract burns. Symptoms of exposure may include: Nasal discharge, hoarseness, coughing, chest pain and breathing difficulty.

Ingestion
Causes digestive tract burns. Symptoms of exposure may include: Severe damage to the mouth, throat esophagus and/or stomach.

The toxicological data given are determined by analogy.

12. Ecological Information

Butyric anhydride

Acute oral toxicity
LD50: > 5000 mg/kg, rat

Acute dermal toxicity
LD50: > 5000 mg/kg, rabbit

Acute inhalation toxicity
LC50: > 2200 (calculated) ppm, rat, 8h

Skin corrosion/irritation
irritating

Species: rabbit

Serious eye damage/eye irritation
Severe eye irritation
Species: rabbit eye

The toxicological data given are determined by analogy.

Butyric anhydride

Acute fish toxicity
LC50: 90 mg/l (48h)
(Reference substance: Butyric acid)
Species: Oryzias latipes (Medaka)
Method: QSAR

Chronic fish toxicity
LC50: 245-480 mg/l (48h)
(Reference substance: Butyric acid)
Species: Leuciscus idus (Golden orfe)
Method: DIN 38412 T.15

Acute daphnia toxicity
EC50: 800-1000 mg/l (48h)
Species: Daphnia magna
Method: DIN 38412, Part 11
12. Ecological Information

**Toxicity to aquatic plants**
Species: Scenedesmus subspicatus
EC50: 46.7 mg/l (72h)
(Reference substance: Butyric acid)

**Toxicity to bacteria**
Species: Entosiphon sulcatum
Toxicological threshold concentration (72h): 26 mg/l
(Reference substance: Butyric acid)

**Biodegradation**
Method: OECD 302 B (Zahn-Wellens Test)
Reportable Quantity (RQ): Butyric acid - 5000 lb/ 2268 kg
Biodegradation: Inherently biodegradable
Bioconcentration factor (BCF): 2.33 (calculated)

**Other potential hazards**
The substance does not meet the criteria for PBT / vPvB according to REACH, Annex XIII

13. Disposal considerations

Dispose of spilled material in accordance with state and local regulations for hazardous waste. Recommended methods are incineration or biological treatment at a federally or state-permitted disposal facility. Note that this information applies to the material as manufactured; processing, use, or contamination may make this information inappropriate, inaccurate, or incomplete.

Note that this handling and disposal information may also apply to empty containers, liners and rinsate. State or local regulations or restrictions are complex and may differ from federal regulations. This information is intended as an aid to proper handling and disposal; the final responsibility for handling and disposal is with the owner of the waste.

14. Transport information

**US Department of Transportation**
- UN/NA Number: UN 2739
- Proper Shipping Name: Butyric anhydride
- Hazard class: 8
- Packing Group: III
- Reportable Quantity (RQ): Butyric acid - 5000 lb/ 2268 kg
- Emergency Resp. Guide: 156

**TDG**
- UN/NA Number: UN 2739
- Proper Shipping Name: BUTYRIC ANHYDRIDE
- Class: 8
- Packing Group: III

**Mexico Transport Information**
- UN-No.: UN 2739
- Proper Shipping Name: Butyric anhydride
- Hazard Class: 8
SAFETY DATA SHEET

Product Name: n-Butyric anhydride
MSDS number: 80510
Revision Number: 5
Revision Date: Mar. 28, 2019
Issuing Date: Mar. 28, 2019

Packing Group: III
Emergency Response Guide: 156

ICAO/IATA
UN-No.: UN 2739
Proper Shipping Name: Butyric anhydride
Hazard Class: 8
Packing group: III

IMDG
UN/ID No.: UN 2739
Proper Shipping Name: Butyric anhydride
Hazard Class: 8
Packing group: III
Marine pollutant: no
EmS Code: F-A, S-B

15. Regulatory Information

US State Regulations
Chemicals associated with the product which are subject to the state right-to-know regulations are listed along with the applicable state(s):

Butyric anhydride 106-31-0
New Jersey Listed
n-Butyric acid 107-92-6
Pennsylvania Listed
New York Listed
New Jersey Listed
Illinois Listed
Massachusetts Listed
Rhode Island Listed

U.S. FEDERAL REGULATIONS

TSCA Inventory:
We certify that all components are either on the TSCA inventory or qualify for an exemption.

Environmental Regulations:

n-Butyric acid 107-92-6
CERCLA Hazardous Substance Listed

SARA 311:
Acute health: Yes
Chronic health: No

8 of 10
n-Butyric acid 107-92-6

Fire: Yes
Sudden release of pressure: No
Reactive: Yes

INTERNATIONAL REGULATIONS

International Inventories
Listed on the chemical inventories of the following countries or qualifies for an exemption:
  - Australia (AICS)
  - Canada (DSL)
  - China (IECSC)
  - Europe (EINECS)
  - Japan (ENCS)
  - Japan (ISHL)
  - New Zealand (NZIoC)
  - Philippines (PICCS)
  - United States (TSCA)

16. Other information

NFPA: Health: 3 Flammability: 2 Instability: 1
HMIS: Health: 3 Flammability: 2 Physical Hazard: 1

Prepared By
Product Stewardship Department
Celanese

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

Other Information:
Observe national and local legal requirements
Changes against the previous version are marked by ***
Abbreviation and Acronym:
ADR = Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
CAS = Chemical Abstracts Service (division of the American Chemical Society)
CLP = Classification, Labelling and Packaging
DNEL = Derived No Effect Level
EINECS = European Inventory of Existing Commercial Chemical Substances
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC Code = International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IMO)
ICAO = International Civil Aviation Organization
IMDG = International Maritime Code for Dangerous Goods
LC50 = Lethal Concentration
LD50 = Lethal Dose
LOAEC = Low Observed Adverse Effect Concentration
LOAEL = Low Observed Adverse Effect Level
LOEL = Low Observed Effect Level
NOAEC = No Observed Adverse Effect Concentration
NOAEL = No Observed Adverse Effect Level
NOEC = No Observed Effect Concentration
NOEL = No Observed Effect Level
PBT = Persistent, Bioaccumulative and Toxic
PNEC = Predicted No Effect Concentration
RCR = Risk Characterization Ratio
RID = Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
STP = Sewage Treatment Plant
vPvB = very Persistent and very Bioaccumulative