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

1.1  Product identifiers
Product name     : gamma- Butyrolactone
CAS-No.          : 96-48-0

1.2  Relevant identified uses of the substance or mixture and uses advised against
Identified uses   : Laboratory chemicals, Industrial & for professional use only.

1.3  Details of the supplier of the safety data sheet
Company          : Central Drug House (P) Ltd
                  : 7/28 Vardaan House
                  : New Delhi-10002
                  : INDIA
Telephone        : +91 11 49404040
Email            : care@cdhfinechemical.com

1.4  Emergency telephone number
Emergency Phone # : +91 11 49404040 (9:00am - 6:00 pm) [Office hours]

SECTION 2: Hazards identification

2.1  Classification of the substance or mixture
Classification according to Regulation (EC) No 1272/2008
Acute toxicity, Oral (Category 4), H302
Serious eye damage (Category 1), H318
Specific target organ toxicity - single exposure (Category 3), H336

For the full text of the H-Statements mentioned in this Section, see Section 16.

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

Signal word      : Danger
Hazard statement(s)
H302            : Harmful if swallowed.
H318            : Causes serious eye damage.
H336            : May cause drowsiness or dizziness.
Precautionary statement(s)
P261             : Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P280             : Wear protective gloves/ 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.

Supplemental Hazard

Statements

2.3 Other hazards
This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.1 Substances
Synonyms:
- 4-Hydroxybutyric acid lactone
- GBL
- γ-Hydroxybutyric acid lactone
- gamma-Butyrolactone

Formula: C₄H₆O₂
Molecular weight: 86.09 g/mol
CAS-No.: 96-48-0
EC-No.: 202-509-5
Registration number: 01-2119533169-37-0007

Hazardous ingredients according to Regulation (EC) No 1272/2008

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>γ-Butyrolactone</td>
<td>Acute Tox. 4; Eye Dam. 1;</td>
<td>&lt;= 100 %</td>
</tr>
<tr>
<td></td>
<td>STOT SE 3; H302, H318, H336</td>
<td></td>
</tr>
<tr>
<td>CAS-No.</td>
<td>96-48-0</td>
<td></td>
</tr>
<tr>
<td>EC-No.</td>
<td>202-509-5</td>
<td></td>
</tr>
<tr>
<td>Registration number</td>
<td>01-2119533169-37-0007</td>
<td></td>
</tr>
</tbody>
</table>

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.

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
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available
SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

Carbon oxides
Combustible liquid.

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. For personal protection see section 8.

6.2 Environmental precautions

Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Store in cool place. 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.

hygroscopic
Storage class (TRGS 510): Combustible liquids not in Storage Class 3

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Tightly fitting safety goggles. Faceshield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU).
**Skin 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.

**Body Protection**
Complete suit protecting against chemicals. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

**Respiratory protection**
Where risk assessment shows air-purifying respirators are appropriate use (US) or type ABEK (EN 14387) respirator cartridges as a backup to enginee 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).

**Control of environmental exposure**
Do not let product enter 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>a) Appearance</td>
<td>Form: liquid, clear</td>
</tr>
<tr>
<td></td>
<td>Colour: colourless</td>
</tr>
<tr>
<td>b) Odour</td>
<td>No data available</td>
</tr>
<tr>
<td>c) Odour Threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>d) pH</td>
<td>4 at 100 g/l at 20 °C</td>
</tr>
<tr>
<td>e) Melting point/freezing point</td>
<td>Melting point/range: -45 °C - lit.</td>
</tr>
<tr>
<td>f) Initial boiling point and boiling range</td>
<td>204 - 205 °C - lit.</td>
</tr>
<tr>
<td>g) Flash point</td>
<td>98 °C - closed cup</td>
</tr>
<tr>
<td>h) Evaporation rate</td>
<td>No data available</td>
</tr>
<tr>
<td>i) Flammability (solid, gas)</td>
<td>No data available</td>
</tr>
<tr>
<td>j) Upper/lower flammability or explosive limits</td>
<td>Upper explosion limit: 16 %(V)</td>
</tr>
<tr>
<td></td>
<td>Lower explosion limit: 1.4 %(V)</td>
</tr>
<tr>
<td>k) Vapour pressure</td>
<td>1.5 mmHg at 20 °C</td>
</tr>
<tr>
<td>l) Vapour density</td>
<td>2.97 - (Air = 1.0)</td>
</tr>
<tr>
<td>m) Relative density</td>
<td>1.12 g/cm3 at 25 °C</td>
</tr>
<tr>
<td>n) Water solubility</td>
<td>No data available</td>
</tr>
<tr>
<td>o) Partition coefficient: n-octanol/water</td>
<td>log Pow: -0.57</td>
</tr>
<tr>
<td>p) Auto-ignition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>q) Decomposition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>r) Viscosity</td>
<td>No data available</td>
</tr>
<tr>
<td>s) Explosive properties</td>
<td>No data available</td>
</tr>
<tr>
<td>t) Oxidizing properties</td>
<td>No data available</td>
</tr>
</tbody>
</table>

#### 9.2 Other safety information

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative vapour density</td>
<td>2.97 - (Air = 1.0)</td>
</tr>
</tbody>
</table>
SECTION 10: Stability and reactivity

10.1 Reactivity
No data available

10.2 Chemical stability
hygroscopic
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong acids, Strong bases, Strong oxidizing agents, Strong reducing agents, Zinc, Plastics

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 1,540 mg/kg(γ-Butyrolactone)
LC50 Inhalation - Rat - 4 h - > 5,100 mg/m3(γ-Butyrolactone)
LD50 Dermal - Guinea pig - > 5,000 mg/kg(γ-Butyrolactone)

Skin corrosion/irritation
No data available(γ-Butyrolactone)

Serious eye damage/eye irritation
No data available(γ-Butyrolactone)

Respiratory or skin sensitisation
No data available(γ-Butyrolactone)

Germ cell mutagenicity
No data available(γ-Butyrolactone)

Carcinogenicity
This product is or contains a component that is not classifiable as to its classification. (γ-Butyrolactone)
(γ-Butyrolactone)
IARC: 3 - Group 3: Not classifiable as to its carcinogenicity to humans (γ-Butyrolactone)

Reproductive toxicity
No data available(γ-Butyrolactone)

Specific target organ toxicity - single exposure
May cause drowsiness or dizziness. (γ-Butyrolactone)

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available(γ-Butyrolactone)

Additional Information
RTECS: LU3500000
an anesthetic effect on the central nervous system characterized by a loss of sensation. Preliminary excitement is the initial effect followed by relaxation, stupor, or sleep. Nausea, Dizziness, Headache (γ-Butyrolactone)

Liver - Irregularities - Based on Human Evidence (γ-Butyrolactone)

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish
LC50 - Leuciscus idus (Golden orfe) - > 220 mg/l - 96 h (γ-Butyrolactone)

Toxicity to daphnia and other aquatic invertebrates
EC50 - Daphnia magna (Water flea) - > 500 mg/l - 48 h (γ-Butyrolactone) (Directive 67/548/EEC, Annex V, C.2.)

Toxicity to algae
EC50 - Desmodesmus subspicatus (green algae) - 360 mg/l - 72 h (γ-Butyrolactone)

12.2 Persistence and degradability

Biodegradability

Biochemical Oxygen Demand (BOD) 1,160 mg/g (γ-Butyrolactone)

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available (γ-Butyrolactone)

12.5 Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects

Additional ecological information
No data available

Adsorbed organic bound halogens (AOX) Remarks: Product does not contain any organic halogens.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging
Dispose of as unused product.
14.1 UN number
   ADR/RID: -
   IMDG: -
   IATA: -

14.2 UN proper shipping name
   ADR/RID: Not dangerous goods
   IMDG: Not dangerous goods
   IATA: Not dangerous goods

14.3 Transport hazard class(es)
   ADR/RID: -
   IMDG: -
   IATA: -

14.4 Packaging group
   ADR/RID: -
   IMDG: -
   IATA: -

14.5 Environmental hazards
   ADR/RID: no
   IMDG Marine pollutant: no
   IATA: no

14.6 Special precautions for user
   No data available

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
   This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006.

15.2 Chemical safety assessment
   For this product a chemical safety assessment was not carried out

SECTION 16: Other information

Full text of H-Statements referred to under sections 2 and 3.

H302  Harmful if swallowed.
H318  Causes serious eye damage.
H336  May cause drowsiness or dizziness.

Further information
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. Central Drug House (P) Ltd and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.cdhfinechemical.com for additional terms and conditions of sale.