Tetrahydrofuran
CAS No 109-99-9

MATERIAL SAFETY DATA SHEET
SDS/MSDS

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

1.1 Product identifiers
Product name: Tetrahydrofuran
CAS-No.: 109-99-9

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
Flammable liquids (Category 2), H225
Acute toxicity, Oral (Category 4), H302
Eye irritation (Category 2), H319
Carcinogenicity (Category 2), H351
Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335

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):
H225 Highly flammable liquid and vapour.
H302 Harmful if swallowed.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.
**H351** Suspected of causing cancer.

Precautionary statement(s)
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell. Rinse mouth.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P370 + P378 In case of fire: Use dry powder or dry sand to extinguish.
P403 + P235 Store in a well-ventilated place. Keep cool.

Supplemental Hazard information (EU)
EUH019 May form explosive peroxides.

### 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**: THF

**Formula**: C\(_4\)H\(_8\)O

**Molecular weight**: 72.11 g/mol

**CAS-No.**: 109-99-9

**EC-No.**: 203-726-8

**Index-No.**: 603-025-00-0

**Registration number**: 01-2119444314-46-XXXX

**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>Tetrahydrofuran</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAS-No.</td>
<td>109-99-9</td>
<td>Flam. Liq. 2; Acute Tox. 4; Eye &lt;= 100 %</td>
</tr>
<tr>
<td>EC-No.</td>
<td>203-726-8</td>
<td>Irrit. 2; Carc. 2; STOT SE 3;</td>
</tr>
<tr>
<td>Index-No.</td>
<td>603-025-00-0</td>
<td>H225, H302, H319, H351,</td>
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<tr>
<td>Registration number</td>
<td>01-2119444314-46-XXXX</td>
<td>H335</td>
</tr>
<tr>
<td></td>
<td>Concentration limits:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt;= 25 %: Eye Irrit. 2, H319;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt;= 25 %: STOT SE 3, H335;</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
Do NOT induce vomiting. 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

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

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. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas. For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

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. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge. 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. Dry residue is explosive. Store under inert gas. Test for peroxide formation periodically and before distillation. Storage class (TRGS 510): Flammable liquids

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

Components with workplace control parameters

Derived No Effect Level (DNEL)

<table>
<thead>
<tr>
<th>Application Area</th>
<th>Exposure routes</th>
<th>Health effect</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workers</td>
<td>Skin contact</td>
<td>Long-term systemic effects</td>
<td>25mg/kg BW/d</td>
</tr>
<tr>
<td>Consumers</td>
<td>Skin contact</td>
<td>Long-term systemic effects</td>
<td>15mg/kg BW/d</td>
</tr>
<tr>
<td>Workers</td>
<td>Inhalation</td>
<td>Long-term local effects</td>
<td>150 mg/m3</td>
</tr>
<tr>
<td>Workers</td>
<td>Inhalation</td>
<td>Long-term systemic effects</td>
<td>150 mg/m3</td>
</tr>
<tr>
<td>Consumers</td>
<td>Inhalation</td>
<td>Acute local effects</td>
<td>62 mg/m3</td>
</tr>
<tr>
<td>Consumers</td>
<td>Inhalation</td>
<td>Acute systemic effects</td>
<td>150 mg/m3</td>
</tr>
</tbody>
</table>

Predicted No Effect Concentration (PNEC)

<table>
<thead>
<tr>
<th>Compartment</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil</td>
<td>2.13 mg/kg</td>
</tr>
<tr>
<td>Marine water</td>
<td>0.432 mg/l</td>
</tr>
<tr>
<td>Fresh water</td>
<td>4.32 mg/l</td>
</tr>
<tr>
<td>Marine sediment</td>
<td>2.33 mg/kg</td>
</tr>
<tr>
<td>Fresh water sediment</td>
<td>23.3 mg/kg</td>
</tr>
<tr>
<td>Onsite sewage treatment plant</td>
<td>4.6 mg/l</td>
</tr>
</tbody>
</table>

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**

Face shield and safety glasses 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, Flame retardant antistatic protective clothing. 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 a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of 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**

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.
SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a) Appearance
   Form: liquid, clear
   Colour: colourless

b) Odour
   ether-like

c) Odour Threshold
   No data available

d) pH
   ca.7

e) Melting point/freezing point
   Melting point/range: -108,44 °C at 1.013,25 hPa

f) Initial boiling point and boiling range
   65,0 - 67,0 °C at 1.013,25 hPa

g) Flash point
   -17,0 °C - closed cup

h) Evaporation rate
   No data available

i) Flammability (solid, gas)
   No data available

j) Upper/lower flammability or explosive limits
   Upper explosion limit: 11,8 %(V)
   Lower explosion limit: 1,8 %(V)

k) Vapour pressure
   170 hPa at 20,0 °C

l) Vapour density
   ca.2,5 at 25 °C - (Air = 1.0)

m) Relative density
   0,89 g/cm³

n) Water solubility
   soluble

o) Partition coefficient: n-octanol/water
   log Pow: 0,46

p) Auto-ignition temperature
   215 °C at 1.013 hPa

q) Decomposition temperature
   No data available

r) Viscosity
   0,518 mm²/s at 25 °C - 0,403 mm²/s at 50 °C -

s) Explosive properties
   Not explosive, In use may form flammable/explosive vapour-air mixture.

t) Oxidizing properties
   The substance or mixture is not classified as oxidizing.

9.2 Other safety information

   Relative vapour density
   ca.2,5 at 25 °C - (Air = 1.0)

SECTION 10: Stability and reactivity

10.1 Reactivity
   No data available

10.2 Chemical stability
   Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
   No data available

10.4 Conditions to avoid
   Heat, flames and sparks.

10.5 Incompatible materials
   Strong oxidizing agents, Acids

10.6 Hazardous decomposition products
   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 - 1.650 mg/kg
LC50 Inhalation - Rat - 6 h - 14.7 mg/l
Remarks: Material may be irritating to mucous membranes and upper respiratory tract.
LD50 Dermal - Rat - > 2.000 mg/kg

Skin corrosion/irritation
Based on available data, the classification criteria are not met.

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Risk of serious damage to eyes.
(Draize Test)

Respiratory or skin sensitisation
Based on available data, the classification criteria are not met.

Germ cell mutagenicity
In vivo tests did not show mutagenic effects
Ames test
S. typhimurium
Result: negative

Carcinogenicity
Suspected human carcinogens
IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Reproductive toxicity
No toxicity to reproduction

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

Specific target organ toxicity - repeated exposure
The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Aspiration hazard
No aspiration toxicity classification

Additional Information
RTECS: LU5950000
Central nervous system depression, Cough, chest pain, Difficulty in breathing, Exposure to high airborne concentrations can cause anesthetic effects.

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish
LC50 - Pimephales promelas (fathead minnow) - 2.160 mg/l - 96 h

Toxicity to daphnia and other aquatic invertebrates
EC50 - Daphnia magna (Water flea) - 382 mg/l - 24 h

Toxicity to algae
Growth inhibition IC50 - Algae - 3.700 mg/l - 192 h
12.2 Persistence and degradability
Biodegradability (OECD Test Guideline 301)
Remarks: According to the results of tests of biodegradability this product is not readily biodegradable.

12.3 Bioaccumulative potential
No bioaccumulation is to be expected (log Pow <= 4).

12.4 Mobility in soil
No data available

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
No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods
Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging
Dispose of as unused product.

SECTION 14: Transport information

14.1 UN number
ADR/RID: 2056  IMDG: 2056  IATA: 2056

14.2 UN proper shipping name
ADR/RID: TETRAHYDROFURAN
IMDG: TETRAHYDROFURAN
IATA: Tetrahydrofuran

14.3 Transport hazard class(es)
ADR/RID: 3  IMDG: 3  IATA: 3

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

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

This safety datasheet complies with the requirements of Regulation (EC) No. 453/2010.

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

15.2 Chemical Safety Assessment
A Chemical Safety Assessment has been carried out for this substance.
SECTION 16: Other information

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

EUH019 May form explosive peroxides.
H225 Highly flammable liquid and vapour.
H302 Harmful if swallowed.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.
H351 Suspected of causing cancer.

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.