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

1.1 Product identifiers

Product name: (−)-Nicotine

Product Number: N3876
Brand: Sigma
Index-No.: 614-001-00-4
CAS-No.: 54-11-5

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

Identified uses: Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company: Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone: +1 314 771-5765
Fax: +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone #: +1-703-527-3887

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Acute toxicity, Oral (Category 2), H300
Acute toxicity, Dermal (Category 1), H310
Short-term (acute) aquatic hazard (Category 1), H400
Long-term (chronic) aquatic hazard (Category 1), H410

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

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word: Danger
Hazard statement(s): H300 + H310 Fatal if swallowed or in contact with skin.
Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P262 Do not get in eyes, on skin, or on clothing.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P273 Avoid release to the environment.
P280 Wear protective gloves/protective clothing.
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P302 + P350 IF ON SKIN: Gently wash with plenty of soap and water.
P310 Immediately call a POISON CENTER/doctor.
P322 Specific measures (see supplemental first aid instructions on this label).
P330 Rinse mouth.
P361 Remove/Take off immediately all contaminated clothing.
P363 Wash contaminated clothing before reuse.
P391 Collect spillage.
P405 Store locked up.
P501 Dispose of contents/container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Synonyms: L(−)-3-(N-Methyl)-α-pyrrolidyl)pyridin
(−)-1-Methyl-2-(3-pyridyl)pyrrolidine

Formula: C_{10}H_{14}N_{2}
Molecular weight: 162.23 g/mol
CAS-No.: 54-11-5
EC-No.: 200-193-3
Index-No.: 614-001-00-4

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>(−)-Nicotine</td>
<td>Acute Tox. 3; Acute Tox. 1; Aquatic Acute 1;</td>
<td>&lt;= 100 %</td>
</tr>
<tr>
<td></td>
<td>Aquatic Chronic 2; H301, H310, H400, H411, M-Factor - Aquatic Acute: 1</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. Move out of dangerous area.

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. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

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, Nitrogen oxides (NOx)

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
Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe 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. Discharge into the environment must be avoided.
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
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.

Storage class (TRGS 510): 6.1B: Non-combustible, acute toxic Cat. 1 and 2 / very toxic hazardous materials

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

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>(−)-Nicotine</td>
<td>54-11-5</td>
<td>TWA</td>
<td>0.5 mg/m³</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
</tbody>
</table>

Remarks
Central Nervous System impairment
Gastrointestinal damage
Cardiac impairment
Danger of cutaneous absorption

TWA          0.5 mg/m³          USA. NIOSH Recommended Exposure Limits

Potential for dermal absorption

TWA          0.5 mg/m³          USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants

Skin designation

PEL          0.075 ppm
0.5 mg/m³    California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Skin
8.2 Exposure controls

**Appropriate engineering controls**
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

**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.

Full contact
Material: butyl-rubber
Minimum layer thickness: 0.3 mm
Break through time: 480 min
Material tested:Butoject® (KCL 897 / Aldrich Z677647, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.4 mm
Break through time: 30 min
Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

**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 a full-face respirator with multi-purpose combination (US) or type ABEK (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. Discharge into the environment must be avoided.
SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a) Appearance  Form: clear, liquid
b) Odour  No data available
c) Odour Threshold  No data available
d) pH  10.2
e) Melting point/freezing point  Melting point/range: -79 °C (-110 °F)
f) Initial boiling point and boiling range  247 °C 477 °F at 993 hPa
g) Flash point  101 °C (214 °F) - closed cup
h) Evaporation rate  No data available
i) Flammability (solid, gas)  No data available
j) Upper/lower flammability or explosive limits  No data available
k) Vapour pressure  0.051 hPa at 25 °C (77 °F)
l) Vapour density  5.6 - (Air = 1.0)
m) Relative density  1.010 g/cm3 at 20 °C (68 °F)
 n) Water solubility  completely miscible
o) Partition coefficient: n-octanol/water  log Pow: 1.17
p) Auto-ignition temperature  No data available
q) Decomposition temperature  No data available
r) Viscosity  No data available
s) Explosive properties  No data available
t) Oxidizing properties  No data available

9.2 Other safety information

Solubility in other solvents  Ethanol 50 g/l
Relative vapour density  5.6 - (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**
No data available

10.5 **Incompatible materials**
Strong oxidizing agents

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

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**SECTION 11: Toxicological information**

11.1 **Information on toxicological effects**

**Acute toxicity**
LD50 Oral - Rat - male and female - 70 mg/kg
(OECD Test Guideline 401)
LD50 Dermal - Rabbit - 50 mg/kg
Remarks: (RTECS)

**Skin corrosion/irritation**
slight irritation

**Serious eye damage/eye irritation**
Eyes - In vitro study
Result: negative
(OECD Test Guideline 437)

**Respiratory or skin sensitisation**
Sensitisation test: - Mouse
Result: Does not cause skin sensitisation.
(OECD Test Guideline 429)

**Germ cell mutagenicity**
Ames test
Salmonella typhimurium
Result: negative
(National Toxicology Program)

**Carcinogenicity**

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.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA’s list of regulated carcinogens.
Reproductive toxicity

**Specific target organ toxicity - single exposure**
Acute inhalation toxicity - Irritation symptoms in the respiratory tract.

**Specific target organ toxicity - repeated exposure**

Aspiration hazard

**Additional Information**
RTECS: QS5250000

prolonged or repeated exposure can cause:, Vomiting, Diarrhoea, Convulsions, To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

After absorption:
Nausea, Vomiting, Diarrhoea
Systemic effects:
Headache, Dizziness, cardiovascular disorders, CNS disorders, agitation, spasms, depressed respiration, collapse, Coma
Other dangerous properties can not be excluded.
This substance should be handled with particular care.

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

**SECTION 12: Ecological information**

12.1 **Toxicity**

Toxicity to fish
LC50 - Oncorhynchus mykiss (rainbow trout) - 4 mg/l - 96 h
Remarks: (ECOTOX Database)

Toxicity to daphnia and other aquatic invertebrates
static test EC50 - Daphnia pulex (Water flea) - 0.24 mg/l - 48 h
(US-EPA)

Toxicity to algae
static test EC50 - Desmodesmus subspicatus (green algae) - 11 mg/l - 72 h
(OECD Test Guideline 201)

12.2 **Persistence and degradability**

Biodegradability
aerobic - Exposure time 28 d
Result: 71 % - Readily biodegradable.
(OECD Test Guideline 301B)

12.3 **Bioaccumulative potential**

12.4 **Mobility in soil**

12.5 **Results of PBT and vPvB assessment**
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 **Other adverse effects**
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life.
Insecticide
Hazard for drinking water supplies. Discharge into the environment must be avoided.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

SECTION 14: Transport information

DOT (US)
UN number: 1654 Class: 6.1 Packing group: II
Proper shipping name: Nicotine
Reportable Quantity (RQ): 100 lbs
Poison Inhalation Hazard: No

IMDG
UN number: 1654 Class: 6.1 Packing group: II EMS-No: F-A, S-A
Proper shipping name: NICOTINE Marine pollutant: yes

IATA
UN number: 1654 Class: 6.1 Packing group: II
Proper shipping name: Nicotine

SECTION 15: Regulatory information

SARA 302 Components
The following components are subject to reporting levels established by SARA Title III, Section 302:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
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<tbody>
<tr>
<td>(-)-Nicotine</td>
<td>54-11-5</td>
<td>2008-11-03</td>
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</table>

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

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<tbody>
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<td>(-)-Nicotine</td>
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</tr>
</tbody>
</table>

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components
(-)-Nicotine  
CAS-No. 54-11-5  
Revision Date 2008-11-03

Pennsylvania Right To Know Components  
(-)-Nicotine  
CAS-No. 54-11-5  
Revision Date 2008-11-03

New Jersey Right To Know Components  
(-)-Nicotine  
CAS-No. 54-11-5  
Revision Date 2008-11-03

California Prop. 65 Components  
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.(-)-Nicotine  
CAS-No. 54-11-5  
Revision Date 2007-09-28

SECTION 16: Other information

Further information
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Revision Date: 01/15/2020  
Print Date: 05/30/2020