

## Safety Data Sheet acc. to OSHA HCS

Date of issue: 01/05/2026

Revision date 01/05/2026

### 1 Identification

- **Product identifier**
- **Trade name:** (-)-Nicotine
- **Synonym**  
3-[(2S)-1-methyl-2-pyrrolidinyl]-pyridine  
L-Nicotine  
(-)-(S)-Nicotine
- **CAS Number:**  
54-11-5
- **Other means of identification**
- **Article number:** 29138
- **EC number:**  
200-193-3
- **Index number:**  
614-001-00-4
- **Application of the substance / the mixture**  
This product is for research use - Not for human or veterinary diagnostic or therapeutic use.
- **Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**  
Cayman Chemical Co.  
1180 E. Ellsworth Rd.  
Ann Arbor, MI 48108  
USA
- **Information department:** Product safety department
- **Emergency telephone number:**  
During normal opening times: +1 (734) 971-3335  
US/CANADA: 800-424-9300  
Outside US/CANADA: 703-741-5970

### 2 Hazard(s) identification

- **Classification of the substance or mixture**



GHS06 Skull and crossbones

Acute toxicity - oral 2            H300 Fatal if swallowed.  
Acute toxicity - dermal 1        H310 Fatal in contact with skin.  
Acute toxicity - inhalation 2    H330 Fatal if inhaled.



GHS05 Corrosion

Eye damage 1                    H318 Causes serious eye damage.

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GHS09 Environment

Aquatic Acute 1

H400 Very toxic to aquatic life.

Aquatic Chronic 2

H411 Toxic to aquatic life with long lasting effects.



GHS07

Skin irritation 2

H315 Causes skin irritation.

- **Label elements**

- **GHS label elements**

The substance is classified and labeled according to the Globally Harmonized System (GHS).

- **Hazard pictograms**



GHS05



GHS06



GHS09

- **Signal word** Danger

- **Hazard statements**

H300+H310+H330 Fatal if swallowed, in contact with skin or if inhaled.

H315 Causes skin irritation.

H318 Causes serious eye damage.

H400 Very toxic to aquatic life.

H411 Toxic to aquatic life with long lasting effects.

- **Precautionary statements**

P260 Do not breathe dust/fume/gas/mist/vapors/spray.

P262 Do not get in eyes, on skin, or on clothing.

P264 Wash thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P271 Use only outdoors or in a well-ventilated area.

P273 Avoid release to the environment.

P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.

P284 [In case of inadequate ventilation] wear respiratory protection.

P301+P310 If swallowed: Immediately call a poison center/doctor.

P330 Rinse mouth.

P302+P352 If on skin: Wash with plenty of water.

P304+P340 If inhaled: Remove person to fresh air and keep comfortable for breathing.

P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P320 Specific treatment is urgent (see on this label).

P361+P364 Take off immediately all contaminated clothing and wash it before reuse.

P332+P313 If skin irritation occurs: Get medical advice/attention.

P391 Collect spillage.

P403+P233 Store in a well-ventilated place. Keep container tightly closed.

P405 Store locked up.

P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

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- Information pertaining to particular dangers for man and environment:
- Classification system:
- NFPA ratings (scale 0 - 4)



Health = 4  
Fire = 1  
Reactivity = 0

- HMIS-ratings (scale 0 - 4)



Health = \*4  
Fire = 1  
Reactivity = 0

- Other hazards
- Results of PBT and vPvB assessment
- PBT: Not applicable.
- vPvB: Not applicable.
- Classification according to (d)(1)(ii) of § 1910.1200  
The SDS issuer does not object to the classifications provided by importers or manufacturers of precursor products.
- Hazards not otherwise classified  
There are no adverse physical or health effects known that are not covered by the hazard classes of the Hazard Communications Standard.

## 3 Composition/information on ingredients

- Chemical characterization: Substances
- CAS No. Description  
54-11-5 (-)-Nicotine
- Identification number(s)
- EC number: 200-193-3
- Index number: 614-001-00-4

## 4 First-aid measures

- Description of first aid measures
- General information:  
Immediately remove any clothing soiled by the product.  
Remove breathing apparatus only after contaminated clothing have been completely removed.  
In case of irregular breathing or respiratory arrest provide artificial respiration.
- After inhalation:  
Supply fresh air or oxygen; call for doctor.  
In case of unconsciousness place patient stably in side position for transportation.
- After skin contact: Immediately wash with water and soap and rinse thoroughly.
- After eye contact: Rinse opened eye for several minutes under running water. Then consult a doctor.
- After swallowing: Do not induce vomiting; immediately call for medical help.
- Most important symptoms and effects, both acute and delayed  
No further relevant information available.
- Indication of any immediate medical attention and special treatment needed  
No further relevant information available.

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## 5 Fire-fighting measures

- **Extinguishing media**
- **Suitable extinguishing agents:**  
CO<sub>2</sub>, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **Special hazards arising from the substance or mixture** No further relevant information available.
- **Advice for firefighters**
- **Protective equipment:** Mouth respiratory protective device.

## \* 6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**  
Wear protective equipment. Keep unprotected persons away.
- **Environmental precautions:**  
Inform respective authorities in case of seepage into water course or sewage system.  
Dilute with plenty of water.  
Do not allow to enter sewers/ surface or ground water.
- **Methods and material for containment and cleaning up:**  
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).  
Use neutralizing agent.  
Dispose contaminated material as waste according to section 13.  
Ensure adequate ventilation.
- **Protective Action Criteria for Chemicals**
  - **PAC-1:** 1.5 mg/m<sup>3</sup>
  - **PAC-2:** 3.5 mg/m<sup>3</sup>
  - **PAC-3:** 35 mg/m<sup>3</sup>
- **Reference to other sections**  
See Section 7 for information on safe handling.  
See Section 8 for information on personal protection equipment.  
See Section 13 for disposal information.

## \* 7 Handling and storage

- **Precautions for safe handling**  
Ensure good ventilation/exhaustion at the workplace.  
Open and handle receptacle with care.
- **Information about protection against explosions and fires:**  
Keep respiratory protective device available.
- **Conditions for safe storage, including any incompatibilities**
- **Storage:** Store in accordance with information listed on the product insert.
- **Requirements to be met by storerooms and receptacles:** No special requirements.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** Keep receptacle tightly sealed.
- **Specific end use(s)** No further relevant information available.

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## 8 Exposure controls/personal protection

- Control parameters

- Components with limit values that require monitoring at the workplace:

### 54-11-5 (-)-Nicotine

PEL	Long-term value: 0.5 mg/m <sup>3</sup> Skin
REL	Long-term value: 0.5 mg/m <sup>3</sup> Skin
TLV	Short-term value: 0.0075 ppm Long-term value: 0.002 ppm Skin, SL 0.003 mg/cm <sup>2</sup> , ACGIH A4

- Additional information:** The lists that were valid during the creation were used as basis.

- Exposure controls**

- Appropriate engineering controls** No further data; see section 7.

- Personal protective equipment:**

- General protective and hygienic measures:**

Keep away from foodstuffs, beverages and feed.  
Immediately remove all soiled and contaminated clothing.  
Wash hands before breaks and at the end of work.  
Store protective clothing separately.  
Avoid contact with the skin.  
Avoid contact with the eyes and skin.

- Breathing equipment:**

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

- Protection of hands:**



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture. Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

- Material of gloves**

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

- Penetration time of glove material**

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

- Eye protection:**



Tightly sealed goggles

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## 9 Physical and chemical properties

### · Information on basic physical and chemical properties

· <b>General Information</b>	
· <b>Physical state</b>	Liquid
· <b>Color:</b>	Not determined.
· <b>Odor:</b>	Characteristic
· <b>Structural Formula</b>	C <sub>10</sub> H <sub>14</sub> N <sub>2</sub>
· <b>Molecular Weight</b>	162.2 g/mol
· <b>Storage Buffer</b>	
· <b>Odor threshold:</b>	Not determined.
· <b>Formulation</b>	
· <b>Melting point/Melting range:</b>	-79 °C (-110.2 °F)
· <b>Boiling point/Boiling range:</b>	247 °C (476.6 °F)
· <b>Flammability:</b>	Not applicable.
· <b>Explosion limits:</b>	
· <b>Lower:</b>	0.7 Vol %
· <b>Upper:</b>	4 Vol %
· <b>Flash point:</b>	95 °C (203 °F)
· <b>Auto igniting:</b>	240 °C (464 °F)
· <b>Decomposition temperature:</b>	Not determined.
· <b>pH-value:</b>	Not determined.
· <b>Viscosity:</b>	
· <b>Kinematic:</b>	Not determined.
· <b>SOLUBILITY</b>	DMF: 50 mg/ml; DMSO: 30 mg/ml; Ethanol: 50 mg/ml; PBS (pH 7.2): 1 mg/ml
· <b>Dynamic:</b>	Not determined.
· <b>Solubility in / Miscibility with</b>	
· <b>Water:</b>	Fully miscible.
· <b>Partition coefficient (n-octanol/water):</b>	Not determined.
· <b>Vapor pressure at 20 °C (68 °F):</b>	0.056 hPa (0 mm Hg)
· <b>Vapor pressure at 50 °C (122 °F):</b>	0.36 hPa (0.3 mm Hg)
· <b>Density at 20 °C (68 °F):</b>	1.0092 g/cm <sup>3</sup> (8.42177 lbs/gal)
· <b>Relative density</b>	Not determined.
· <b>Vapor density</b>	Not determined.
· <b>Particle characteristics</b>	Not applicable.

### · Other information

· <b>Appearance:</b>	
· <b>Form:</b>	oil
· <b>Important information on protection of health and environment, and on safety.</b>	
· <b>Ignition temperature:</b>	Not determined.
· <b>Danger of explosion:</b>	Product does not present an explosion hazard.
· <b>Change in condition</b>	
· <b>Evaporation rate</b>	Not determined.

## 10 Stability and reactivity

- **Reactivity** No further relevant information available.

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- **Chemical stability**
- **Thermal decomposition / conditions to be avoided:**  
No decomposition if used according to specifications.
- **Possibility of hazardous reactions** No dangerous reactions known.
- **Conditions to avoid** No further relevant information available.
- **Incompatible materials:** No further relevant information available.
- **Hazardous decomposition products:** No dangerous decomposition products known.

## 11 Toxicological information

- **RTECS Number** QS5250000
- **Information on toxicological effects**
- **Acute toxicity:**

- **LD/LC50 values that are relevant for classification:**

Oral	TDLO	0.027 mg/kg (man) 16 mg/kg (mouse)
	LD50	50 mg/kg (rat)
	LD50	3,340 µg/kg (mouse)
Dermal	Skin TDLO	0.07 mg/kg (human)
	LD50	140 mg/kg (rat)
Inhalative	TCLO	0.014 mg/kg (human)
	Subcutaneous TDLO	0.65 mg/kg (mouse)
	Subcutaneous LD50	16 mg/kg (mouse) 23.5 mg/kg (rat)
	Subcutaneous TDLO	125 µg/kg (rat)

- **Primary irritant effect:**
- **on the skin:** Irritant to skin and mucous membranes.
- **on the eye:** Strong irritant with the danger of severe eye injury.
- **Sensitization:** No sensitizing effects known.
- **Additional toxicological information:** Danger through skin absorption.
- **Interactive effects** No interactive effects between components are known.
- **Carcinogenic categories**
- **IARC (International Agency for Research on Cancer)** Substance is not listed.
- **NTP (National Toxicology Program)** Substance is not listed.
- **OSHA-Ca (Occupational Safety & Health Administration)** Substance is not listed.
- **Alternative sources for toxicological information**  
No non-standard sources for toxicological information where used.

## 12 Ecological information

- **Toxicity**
- **Aquatic toxicity:** No further relevant information available.
- **Persistence and degradability** No further relevant information available.
- **Bioaccumulative potential** No further relevant information available.
- **Mobility in soil** No further relevant information available.
- **Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.

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- **Other adverse effects**

- **Remark:**

Very toxic for fish

Toxic for fish

- **Additional ecological information:**

- **General notes:**

Water hazard class 3 (Self-assessment): extremely hazardous for water

Do not allow product to reach ground water, water course or sewage system, even in small quantities.

Must not reach bodies of water or drainage ditch undiluted or unneutralized.

Danger to drinking water if even extremely small quantities leak into the ground.

Also poisonous for fish and plankton in water bodies.

Very toxic for aquatic organisms

Toxic for aquatic organisms

### 13 Disposal considerations

- **Waste treatment methods**

- **Recommendation:**

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

- **Uncleaned packagings:**

- **Recommendation:** Disposal must be made according to official regulations.

- **Recommended cleansing agent:** Water, if necessary with cleansing agents.

### 14 Transport information

- **UN-Number**

- **DOT, IMDG, IATA**

UN1654

- **UN proper shipping name**

- **DOT, IATA**

Nicotine

- **IMDG**

NICOTINE

- **Transport hazard class(es)**

- **DOT**



- **Class**

6.1 Toxic substances

- **Label**

6.1

- **IMDG**



- **Class**

6.1 Toxic substances

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· <b>Label</b>	6.1
· <b>IATA</b>	
	
· <b>Class</b>	6.1 Toxic substances
· <b>Label</b>	6.1
· <b>Packing group</b>	
· <b>DOT, IMDG, IATA</b>	II
· <b>Environmental hazards:</b>	Environmentally hazardous substance, liquid
· <b>Marine pollutant:</b>	Symbol (fish and tree)
· <b>Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code</b>	Not applicable.
· <b>Transport/Additional information:</b>	
· <b>DOT</b>	
· <b>Quantity limitations</b>	On passenger aircraft/rail: 5 L On cargo aircraft only: 60 L
· <b>IMDG</b>	
· <b>Limited quantities (LQ)</b>	100 ml
· <b>Excepted quantities (EQ)</b>	Code: E4 Maximum net quantity per inner packaging: 1 ml Maximum net quantity per outer packaging: 500 ml
· <b>IATA</b>	
· <b>Remarks:</b>	When sold in quantities of less than or equal to 1 mL, or 1 g, with an Excepted Quantity Code of E1, E2, E4, or E5, this item meets the De Minimis Quantities exemption, per IATA 2.6.10. Therefore packaging does not have to be labeled as Dangerous Goods/Excepted Quantity.
· <b>Special precautions for user</b>	Warning: Toxic substances
· <b>Hazard identification number (Kemler code):</b>	60
· <b>EMS Number:</b>	F-A,S-A
· <b>Stowage Category</b>	A
· <b>UN "Model Regulation":</b>	UN 1654 NICOTINE, 6.1, II, ENVIRONMENTALLY HAZARDOUS

## 15 Regulatory information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture**  
No further relevant information available.
- **Sara**
- **Section 355 (extremely hazardous substances):** Substance is listed.
- **Section 313 (Specific toxic chemical listings):** Substance is listed.
- **TSCA (Toxic Substances Control Act):** ACTIVE
- **Hazardous Air Pollutants** Substance is not listed.

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- **Chemicals known to cause cancer:** Substance is not listed.
- **Chemicals known to cause reproductive toxicity for females:** Substance is not listed.
- **Chemicals known to cause reproductive toxicity for males:** Substance is not listed.
- **Chemicals known to cause developmental toxicity:** Substance is listed.
- **Carcinogenic categories**
- **EPA (Environmental Protection Agency)** Substance is not listed.
- **TLV (Threshold Limit Value)** Substance is not listed.
- **NIOSH-Ca (National Institute for Occupational Safety and Health)** Substance is not listed.
- **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

## 16 Other information

All chemicals may pose unknown hazards and should be used with caution. This SDS applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. Cayman Chemical Company assumes no responsibility for incidental or consequential damages, including lost profits, arising from the use of these data. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Cayman Chemical Company assumes no responsibility for the completeness or accuracy of the information contained herein.

- **Department issuing SDS:** Environment protection department.
- **Contact:** -
- **Date of previous version** 05/31/2024
- **Date of preparation** 01/05/2026
- **Abbreviations and acronyms:**
  - IMDG: International Maritime Code for Dangerous Goods
  - DOT: US Department of Transportation
  - IATA: International Air Transport Association
  - EINECS: European Inventory of Existing Commercial Chemical Substances
  - CAS: Chemical Abstracts Service (division of the American Chemical Society)
  - NFPA: National Fire Protection Association (USA)
  - HMIS: Hazardous Materials Identification System (USA)
  - LC50: Lethal concentration, 50 percent
  - LD50: Lethal dose, 50 percent
  - PBT: Persistent, Bioaccumulative and Toxic
  - vPvB: very Persistent and very Bioaccumulative
  - NIOSH: National Institute for Occupational Safety
  - OSHA: Occupational Safety & Health
  - TLV: Threshold Limit Value
  - PEL: Permissible Exposure Limit
  - REL: Recommended Exposure Limit
  - Acute toxicity - oral 2: Acute toxicity – Category 2
  - Acute toxicity - dermal 1: Acute toxicity – Category 1
  - Skin irritation 2: Skin corrosion/irritation – Category 2
  - Eye damage 1: Serious eye damage/eye irritation – Category 1
  - Aquatic Acute 1: Hazardous to the aquatic environment - acute aquatic hazard – Category 1
  - Aquatic Chronic 2: Hazardous to the aquatic environment - long-term aquatic hazard – Category 2
- **\* Data compared to the previous version altered.**

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