

SAFETY DATA SHEETS

According to the UN GHS revision 9

Version: 1.0
Creation Date: July 15, 2019
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SECTION 1: Identification

1.1 GHS Product identifier

Product name Pyridine

1.2 Other means of identification

Product number -

Other names Pyridine, nonaqueous titration grade; Pyridine; PYRIDINE

1.3 Recommended use of the chemical and restrictions on use

Identified uses Industrial and scientific research use.

Uses advised against no data available

1.4 Supplier's details

Company Shanghai Baishun Biotechnology Co., Ltd

Address No. 26, Lane 918, Lianye Road, Zhelin Town, Fengxian District, Shanghai, 201400, China

Telephone +86-21-37581181

1.5 Emergency phone number

Emergency phone number +86-21-37581181

Service hours Monday to Friday, 9am-5pm (Standard time zone: UTC/GMT +8 hours).

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

Flammable liquids, Category 2
Acute toxicity - Category 4, Oral
Acute toxicity - Category 4, Dermal
Acute toxicity - Category 4, Inhalation

2.2 GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

Hazard statement(s)

H225 Highly flammable liquid and vapour
H302 Harmful if swallowed
H312 Harmful in contact with skin

	H332 Harmful if inhaled
Precautionary statement(s)	
Prevention	<p>P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.</p> <p>P233 Keep container tightly closed.</p> <p>P240 Ground and bond container and receiving equipment.</p> <p>P241 Use explosion-proof [electrical/ventilating/lighting/...] equipment.</p> <p>P242 Use non-sparking tools.</p> <p>P243 Take action to prevent static discharges.</p> <p>P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...</p> <p>P264 Wash ... thoroughly after handling.</p> <p>P270 Do not eat, drink or smoke when using this product.</p> <p>P261 Avoid breathing dust/fume/gas/mist/vapours/spray.</p> <p>P271 Use only outdoors or in a well-ventilated area.</p>
Response	<p>P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse affected areas with water [or shower].</p> <p>P370+P378 In case of fire: Use ... to extinguish.</p> <p>P301+P317 IF SWALLOWED: Get medical help.</p> <p>P330 Rinse mouth.</p> <p>P302+P352 IF ON SKIN: Wash with plenty of water/...</p> <p>P317 Get medical help.</p> <p>P321 Specific treatment (see ... on this label).</p> <p>P362+P364 Take off contaminated clothing and wash it before reuse.</p> <p>P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.</p>
Storage	P403+P235 Store in a well-ventilated place. Keep cool.
Disposal	P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

2.3 Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
Pyridine	Pyridine	110-86-1	203-809-9	100%

SECTION 4: First-aid measures

4.1 Description of necessary first-aid measures

If inhaled

Fresh air, rest. Artificial respiration may be needed. Refer for medical attention.

Following skin contact

Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer for medical attention .

Following eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

Following ingestion

Rinse mouth. Do NOT induce vomiting. Give one or two glasses of water to drink. Refer for medical attention .

4.2 Most important symptoms/effects, acute and delayed

Vapor irritates eyes and nose. Liquid irritates skin and is absorbed through the skin. Overexposure causes nausea, headache, nervous symptoms, increased urinary frequency. (USCG, 1999)

4.3 Indication of immediate medical attention and special treatment needed, if necessary

Basic treatment: Establish a patent airway. Suction if necessary. Watch for signs of respiratory insufficiency and assist ventilations if necessary. Administer oxygen by nonrebreather mask at 10 to 15 L/min. Monitor for pulmonary edema and treat if necessary. Monitor for shock and treat if necessary. For eye contamination, flush eyes immediately with water. Irrigate each eye continuously with normal saline during transport. Do not use emetics. For ingestion, rinse mouth and administer 5 ml/kg up to 200 ml of water for dilution if the patient can swallow, has a strong gag reflex, and does not drool. Administer activated charcoal. Aromatic hydrocarbons and related compounds

SECTION 5: Fire-fighting measures

5.1 Suitable extinguishing media

Use water spray, dry chemical, "alcohol resistant" foam, or carbon dioxide. Solid streams of water may be ineffective. Use water spray to keep fire-exposed containers cool.

5.2 Specific hazards arising from the chemical

Behavior in Fire: Vapor is heavier than air and may travel considerable distance to source of ignition and flash back. (USCG, 1999)

5.3 Special protective actions for fire-fighters

Use water in large amounts, powder, alcohol-resistant foam, carbon dioxide. In case of fire: keep drums, etc., cool by spraying with water.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal protection: self-contained breathing apparatus. Remove all ignition sources. Do NOT wash away into sewer. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

6.2 Environmental precautions

Personal protection: self-contained breathing apparatus. Remove all ignition sources. Do NOT wash away into sewer. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

6.3 Methods and materials for containment and cleaning up

1. remove all ignition sources. 2. ventilate area of spill or leak. 3. for small quantities, absorb on paper towels, evaporate in safe place (such as fume hood). allow sufficient time for evaporating vapors to completely clear hood ductwork. burn paper in suitable location away from combustible material. 3. large quantities can be collected & atomized in suitable combustion chamber equipped with appropriate effluent gas cleaning device. pyridine should not be allowed to enter confined space, such as sewer, because of possibility of explosion.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

NO open flames, NO sparks and NO smoking. Closed system, ventilation, explosion-proof electrical equipment and lighting. Do NOT use compressed air for filling, discharging, or handling. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

7.2 Conditions for safe storage, including any incompatibilities

Fireproof. Separated from strong oxidants and strong acids. Cool. Dry. Well closed. OUTSIDE OR DETACHED STORAGE IS PREFERABLE. ISOLATE FROM POWERFUL OXIDIZING MATERIALS AND ACIDS.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

TLV: 1 ppm as TWA; A3 (confirmed animal carcinogen with unknown relevance to humans). MAK: skin absorption (H); carcinogen category: 3B

Biological limit values

no data available

8.2 Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear safety spectacles or face shield.

Skin protection

Protective gloves. Protective clothing.

Respiratory protection

Use ventilation, local exhaust or breathing protection.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state	Liquid.
Colour	Colourless.
Odour	Sharp, nauseating
Melting point/freezing point	-41.6 °C. Atm. press.:1.013 hPa. Remarks:Assume standard atmospheric pressure.
Boiling point or initial boiling point and boiling range	115.2 °C. Atm. press.:1.013 hPa. Remarks:Assume standard atmospheric pressure.
Flammability	Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.
Lower and upper explosion limit/flammability limit	LOWER 1.8%; UPPER 12.4%
Flash point	20 °C. Atm. press.:1.013 hPa.
Auto-ignition temperature	900 °C. Atm. press.:1.013 hPa. Remarks:Assume standard atmospheric pressure.
Decomposition temperature	no data available
pH	8.81. Remarks:Basic.
Kinematic viscosity	dynamic viscosity (in mPa s) = 0.879. Temperature:25.0°C.
Solubility	Miscible with water
Partition coefficient n-octanol/water	log Pow = 0.64. Temperature:20 °C.

Vapour pressure	20 mm Hg. Temperature:25 °C. Remarks:Equivalent to 26.66 hPa.
Density and/or relative density	0.982 no units. Temperature:20 °C.
Relative vapour density	2.72 (vs air)
Particle characteristics	no data available

SECTION 10: Stability and reactivity

10.1 Reactivity

Decomposes on burning. This produces toxic fumes of nitrogen oxides and hydrogen cyanide. The substance is a weak base. Reacts violently with strong oxidants and strong acids.

10.2 Chemical stability

Mixtures with formamide + iodine + sulfur trioxide are storage hazards, releasing carbon dioxide & sulfuric acid.

10.3 Possibility of hazardous reactions

Pyridine is a flammable ... liquid. The vapour is heavier than air and may travel along the ground; distant ignition possible. PYRIDINE is a base. Reacts exothermically with acids. During preparation of a complex of pyridine with chromium trioxide, an acid, the proportion of chromium trioxide was increased. Heating from this acid-base reaction led to an explosion and fire [MCA Case History 1284 1967]. A 0.1% solution of pyridine (or other tertiary amine) in maleic anhydride at 185°C gives an exothermic decomposition with rapid evolution of gas [Chem Eng. News 42(8); 41 1964]. Mixing pyridine in equal molar portions with any of the following substances in a closed container caused the temperature and pressure to increase: chlorosulfonic acid, nitric acid (70%), oleum, sulfuric acid (96%), or propiolactone [NFPA 1991]. The combination of iodine, pyridine, sulfur trioxide, and formamide developed a gas over pressurization after several months. This arose from the slow formation of sulfuric acid from external water, or from dehydration of the formamide to hydrogen cyanide. Ethylene oxide and SO₂ can react violently in pyridine solution with pressurization if ethylene oxide is in excess (Nolan, 1983, Case History 51).

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

Pyridine reacts violently with chlorosulfonic acid, chromic acid, maleic anhydride, nitric acid, fuming sulfuric acid, perchromates, beta-propiolactone, silver perchlorate, & sulfuric acid.

10.6 Hazardous decomposition products

When pyridine is heated to decomposition, cyanide fumes are released.

SECTION 11: Toxicological information

Acute toxicity

- Oral: LD50 - rat - > 800 - < 1 600 mg/kg bw.
- Inhalation: LC50 - rat (male) - 4 900 ppm.
- Dermal: LD50 - rabbit - > 1 000 - < 2 000 mg/kg bw.

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

A3: Confirmed animal carcinogen with unknown relevance to humans.

Reproductive toxicity

no data available

STOT-single exposure

The substance is irritating to the eyes, skin and respiratory tract. The substance may cause effects on the central nervous system and gastrointestinal tract. Exposure far above the OEL could cause lowering of consciousness.

STOT-repeated exposure

The substance may have effects on the central nervous system, liver and kidneys.

Aspiration hazard

A harmful contamination of the air can be reached rather quickly on evaporation of this substance at 20°C.

SECTION 12: Ecological information

12.1 Toxicity

- Toxicity to fish: EC50 - Danio rerio (previous name: Brachydanio rerio) - > 560 - < 1 000 mg/L - 96 h.
- Toxicity to daphnia and other aquatic invertebrates: EC50 - Daphnia magna - 320 mg/L - 48 h.
- Toxicity to algae: EC50 - Pseudokirchneriella subcapitata (previous names: Raphidocelis subcapitata, Selenastrum capricornutum) - 320 mg/L - 72 h.
- Toxicity to microorganisms: NOEC - activated sludge - 20 mg/L - 28 d.

12.2 Persistence and degradability

Results of biodegradability screening tests for pyridine using sewage or activated sludge inocula give mixed results ranging from rapid to no degradation(1-5,7). Although biodegradability is improved in longer tests employing a more vigorous inocula, sometimes the same test gives disparate results(1-4,7). Variations in the particular sewage or activated sludge inoculum would affect test results. One investigator obtained results ranging from 97% degradation in 6 days to no degradation in 30 days in 6 different standard tests(1). After a preincubation step was added to one test in which no degradation was observed in 19 days, degradability increased to 91%(3). However the closed bottle test which employs only a drop of sewage effluent as an inoculum, registered no degradation even with a preincubation step(1,3). Tests that were designed to simulate biological treatment plants resulted in complete and rapid removal of pyridine(1,9). In one test that employed a soil suspension as an inoculum, 100% degradation was obtained in 66-170 days(6). When this test was repeated under anaerobic conditions, degradation was more rapid(6). Complete degradation was obtained in 32-66 days(6). When 2 micromoles/g of pyridine was incubated with a silt loam soil, 11.7% remained after 4 days and none remained after 8 days(8). The biodegradation rate constant for pyridine in water was 0.0033 - 0.018 per hour which corresponds to half-lives of 39-210 hours(10).

12.3 Bioaccumulative potential

The bioconcentration factor in guppies exposed to an unspecified concentration of pyridine over a 2-day incubation period was 88(1). According to a classification scheme(2), this BCF suggests the bioconcentration in aquatic organisms moderate.

12.4 Mobility in soil

The Koc of pyridine is estimated as 50(SRC), using a measured log Kow of 0.65(1) and a regression-derived equation(2). According to a classification scheme(3), this estimated Koc value suggests that pyridine is expected to have high mobility in soil. The pKa of pyridine

is 5.23(4), which indicates that pyridine will partially exist in the protonated form under acidic conditions and cations adsorb more strongly to soil surfaces than neutral molecules(SRC). The adsorption of pyridine to a basic subsoil (pH 8.15, 0.58% organic carbon) is negligible, while in an acidic subsoil (pH 4.85, 0.24% organic carbon), the Freundlich adsorption constant was measured to be 5.78 and the slope 0.679(5). This suggests a cationic adsorption mechanism as pyridine is predominantly in its protonated form. Pyridine adsorbs to colloidal particles of sodium montmorillonite and kaolinite, a process which is attributed to cation exchange and is a function of pH(5). Adsorption is at a minimum at pH 1 and 11 and reaches a maximum at pH 4 for the montmorillonite and pH 5.5 for the kaolinite where the adsorption constants are 60 and 10, respectively(6).

12.5 Other adverse effects

no data available

SECTION 13: Disposal considerations

13.1 Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

SECTION 14: Transport information

14.1 UN Number

ADR/RID: UN1282 (For reference only, please check.)

IMDG: UN1282 (For reference only, please check.)

IATA: UN1282 (For reference only, please check.)

14.2 UN Proper Shipping Name

ADR/RID: PYRIDINE (For reference only, please check.)

IMDG: PYRIDINE (For reference only, please check.)

IATA: PYRIDINE (For reference only, please check.)

14.3 Transport hazard class(es)

ADR/RID: 3 (For reference only, please check.)

IMDG: 3 (For reference only, please check.)

IATA: 3 (For reference only, please check.)

14.4 Packing group, if applicable

ADR/RID: II (For reference only, please check.)

IMDG: II (For reference only, please check.)

IATA: II (For reference only, please check.)

14.5 Environmental hazards

ADR/RID: No

IMDG: No

IATA: No

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
Pyridine	Pyridine	110-86-1	203-809-9
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.
EC Inventory			Listed.
United States Toxic Substances Control Act (TSCA) Inventory			Listed.
China Catalog of Hazardous chemicals 2015			Listed.
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Listed.
Vietnam National Chemical Inventory			Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)			Listed.
Korea Existing Chemicals List (KECL)			Listed.

SECTION 16: Other information

Information on revision

Creation Date July 15, 2019

Revision Date July 15, 2019

Abbreviations and acronyms

- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association
- TWA: Time Weighted Average
- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%
- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

References

- IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>
- HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>
- IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>
- eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
- CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>
- ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>
- ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: <http://www.phmsa.dot.gov/hazmat/library/erg>
- Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>
- ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

Other Information

Pyridine can normally be detected by odour at levels well below the TLV. However, perception of the odour may decline quickly. Depending on the degree of exposure, periodic medical examination is suggested.

Any questions regarding this SDS, Please send your inquiry to sds@xixisys.com

Disclaimer: 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. We as supplier shall not be held liable for any damage resulting from handling or from contact with the above product.