

Chemical Safety Data Sheet MSDS / SDS

PYRIDINE-D5

Revision Date:2024-12-21 Revision Number:1

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

Product identifier

Product name : PYRIDINE-D5
CBnumber : CB7695818
CAS : 7291-22-7
EINECS Number : 230-720-2
Synonyms : Pyridine-d5,perdeuteriopyridine

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

Relevant identified uses : For R&D use only. Not for medicinal, household or other use.
Uses advised against : none

Company Identification

Company : Chemicalbook
Address : Building 1, Huihuang International, Shangdi 10th Street, Haidian District, Beijing
Telephone : 400-158-6606

SECTION 2: Hazards identification

Classification of the substance or mixture

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

Label elements**Pictogram(s)**

☐☐

Signal word : Danger

Hazard statement(s)

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

H315 Causes skin irritation

H319 Causes serious eye irritation

H332 Harmful if inhaled

H351 Suspected of causing cancer

Precautionary statement(s)

P210 Keep away from heat/sparks/open flames/hot surfaces. — No smoking.

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

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

P281 Use personal protective equipment as required.

P303+P361+P353 IF ON SKIN (or hair): Remove/Take off Immediately all contaminated clothing. Rinse SKIN with water/shower.

P304+P340 IF INHALED: Remove victim to fresh air and Keep at rest in a position 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.

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Prevention

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233 Keep container tightly closed.

P240 Ground and bond container and receiving equipment.

P241 Use explosion-proof [electrical/ventilating/lighting/...] equipment.

P242 Use non-sparking tools.

P243 Take action to prevent static discharges.

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

P264 Wash ... thoroughly after handling.

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

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

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

Response

P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse affected areas with water [or shower].

P370+P378 In case of fire: Use ... to extinguish.

P301+P317 IF SWALLOWED: Get medical help.

P330 Rinse mouth.

P302+P352 IF ON SKIN: Wash with plenty of water/...

P317 Get medical help.

P321 Specific treatment (see ... on this label).

P362+P364 Take off contaminated clothing and wash it before reuse.

P332+P317 If skin irritation occurs: Get medical help.

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

P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

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.

Other hazards

no data available

SECTION 3: Composition/information on ingredients

Substance

Product name	: PYRIDINE-D5
Synonyms	: Pyridine-d5,perdeuteriopyridine
CAS	: 7291-22-7
EC number	: 230-720-2
MF	: C5H5N
MW	: 79.1

SECTION 4: First aid measures

Description of 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 .

Most important symptoms and effects, both 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)

Indication of any immediate medical attention and special treatment needed

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: Firefighting measures

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.

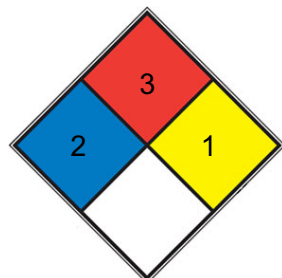
Specific Hazards Arising from the Chemical

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

Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

NFPA 704



HEALTH 2 Intense or continued but not chronic exposure could cause temporary incapacitation or possible residual injury (e.g. [diethyl ether](#), ammonium phosphate, iodine)

FIRE 3 Liquids and solids (including finely divided suspended solids) that can be ignited under almost all ambient temperature conditions. Liquids having a flash point below 22.8 °C (73 °F) and having a boiling point at or above 37.8 °C (100 °F) or having a flash point between 22.8 and 37.8 °C (73 and 100 °F). (e.g. gasoline, [acetone](#))

REACT 1 Normally stable, but can become unstable at elevated temperatures and pressures (e.g. [propene](#))

SPEC.

HAZ.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Avoid dust formation. Avoid breathing mist, gas or vapours. Avoid contacting with skin and eye. Use personal protective equipment. Wear chemical impermeable gloves. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.

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.

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

Precautions for safe 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.

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

Control parameters

Occupational Exposure limit values

Component	(2H5)pyridine
CAS No.	7291-22-7
	Recommended Exposure Limit: 10 Hr Time-Weighted Avg: 5 ppm (15 mg/cu m).

Biological limit values

no data available

Exposure controls

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

Individual protection measures

Eye/face protection

Wear tightly fitting safety goggles with side-shields conforming to EN 166(EU) or NIOSH (US).

Skin protection

Wear fire/flammable resistant and impervious clothing. Handle with gloves. Gloves must be inspected prior to use. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

If the exposure limits are exceeded, irritation or other symptoms are experienced, use a full-face respirator.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties

Information on basic physicochemical properties

Physical state	Liquid
Colour	Colorless
Odour	Sharp, nauseating

Melting point/freezing point	-41°C
Boiling point or initial boiling point and boiling range	114.4°C(lit.)
Flammability	Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.
Lower and upper explosion limit/flammability limit	1.8-12.4%(V)
Flash point	17°C
Auto-ignition temperature	900° F (USCG, 1999)
Decomposition temperature	no data available
pH	8.81 (H2O)
Kinematic viscosity	no data available
Solubility	1000g/l soluble
Partition coefficient n-octanol/water	log Kow = 0.65
Vapour pressure	26.7 hPa (25 °C)
Density and/or relative density	1.05g/mL at 25°C(lit.)
Relative vapour density	2.72 (NTP, 1992) (Relative to Air)
Particle characteristics	no data available

SECTION 10: Stability and reactivity

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.

Chemical stability

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

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).

Conditions to avoid

no data available

Incompatible materials

Pyridine reacts violently with chlorosulfonic acid, chromic acid, maleic anhydride, nitric acid, fuming sulfuric acid, perchromates, beta-

propiolactone, silver perchlorate, & sulfuric acid.

Hazardous decomposition products

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

SECTION 11: Toxicological information

Acute toxicity

- Oral: LD50 Rat oral 1.58 g/kg
- Inhalation: LC50 Rat inhalation 9000 ppm for 1 hr
- Dermal: LD50 Guinea pig percutaneous 1.0 - 2.0 ml/kg

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

no data available

STOT-repeated exposure

no data available

Aspiration hazard

no data available

SECTION 12: Ecological information

Toxicity

Toxicity to fish: LC50 Pimephales promelas (fathead minnow) 106 mg/l/96 hr, flow-through bioassay with measured concentrations, 24.1 deg C, dissolved oxygen 7.4 mg/l, hardness 47.4 mg/l CaCO₃, alkalinity 240 mg/l CaCO₃, and pH 7.73.

Toxicity to daphnia and other aquatic invertebrates: no data available

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

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).

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.

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).

Other adverse effects

no data available

SECTION 13: Disposal considerations

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

UN Number

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

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

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

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.)

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.)

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.)

Environmental hazards

ADR/RID: No

IMDG: No

IATA: No

Special precautions for user

no data available

Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

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

European Inventory of Existing Commercial Chemical Substances (EINECS)

Listed.

EC Inventory

Listed.

United States Toxic Substances Control Act (TSCA) Inventory

Not Listed.

China Catalog of Hazardous chemicals 2015

Not Listed.

New Zealand Inventory of Chemicals (NZIoC)

Listed.

PICCS

Not Listed.

Vietnam National Chemical Inventory

Not Listed.

IECSC

Listed.

Korea Existing Chemicals List (KECL)

Not Listed.

SECTION 16: Other information

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/>

Disclaimer:

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