



SAFETY DATA SHEETS

According to the UN GHS revision 9

Version: 1.0
Creation Date: July 15, 2019
Revision Date: July 15, 2019

SECTION 1: Identification

1.1 GHS Product identifier

Product name Quinoline

1.2 Other means of identification

Product number -

Other names Leucol; 1-Azanaphthalene; Quinoline

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 Yien Chemical Technology Co., Ltd
Address Building 6, 28 Yingong Road, Fengxian District, Shanghai
Chemical Industry Zone, Shanghai, 201400, China
Telephone +86-400-133-2688

1.5 Emergency phone number

Emergency phone number +86-400-133-2688

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

Acute toxicity - Category 4, Oral
Acute toxicity - Category 4, Dermal
Skin irritation, Category 2
Eye irritation, Category 2
Germ cell mutagenicity, Category 2
Carcinogenicity, Category 1B
Hazardous to the aquatic environment, long-term (Chronic) - Category Chronic 2

2.2 GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

Hazard statement(s)	H302 Harmful if swallowed H312 Harmful in contact with skin H315 Causes skin irritation H319 Causes serious eye irritation H341 Suspected of causing genetic defects H350 May cause cancer H411 Toxic to aquatic life with long lasting effects
Precautionary statement(s)	
Prevention	P264 Wash ... thoroughly after handling. P270 Do not eat, drink or smoke when using this product. P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
Response	P203 Obtain, read and follow all safety instructions before use. P273 Avoid release to the environment. 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. P318 IF exposed or concerned, get medical advice. P391 Collect spillage.
Storage	P405 Store locked up.
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
Quinoline	Quinoline	91-22-5	202-051-6	100%

SECTION 4: First-aid measures

4.1 Description of necessary first-aid measures

If inhaled

Fresh air, rest. Refer for medical attention.

Following skin contact

Remove contaminated clothes. Rinse and then wash skin with water and soap.

Following eye contact

Rinse with plenty of water (remove contact lenses if easily possible). Refer for medical attention.

Following ingestion

Rinse mouth. Give one or two glasses of water to drink. Refer for medical attention .

4.2 Most important symptoms/effects, acute and delayed

Vapors are irritating to nose and throat and may cause headaches, dizziness, and nausea if inhaled. Ingestion causes irritation of mouth and stomach; vomiting may occur. Contact with eyes or skin causes irritation. (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

Extinguish with water, dry chemicals, foam, or carbon dioxide.

5.2 Specific hazards arising from the chemical

Special Hazards of Combustion Products: Toxic oxides of nitrogen may form in fires. Behavior in Fire: Heat exposure may cause pressure build-up in closed containers. (USCG, 1999)

5.3 Special protective actions for fire-fighters

Use water spray, foam, powder, 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: filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. 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: filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. 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

Spread over with the 9:1 mixture of sand and soda ash. After mixing, transfer into a paper carton, stuffed with ruffled paper.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

NO open flames. Above 101°C use a closed system and ventilation. 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

Provision to contain effluent from fire extinguishing. Separated from strong oxidants, acids, acid anhydrides and food and feedstuffs. Dry. Keep in the dark. Well closed. Store in an area without drain or sewer access. PROTECT FROM LIGHT & MOISTURE.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

Component	Quinoline			
CAS No.	91-22-5			
	Limit value - Eight hours		Limit value - Short term	
	ppm	mg/m³	ppm	mg/m³
Latvia		0,1		
	Remarks			

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.

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	Colorless to slightly yellowish.
Odour	Penetrating odor, not as offensive as pyridine
Melting point/freezing point	-14.85 °C. Remarks:Estimated for pure product (100%).;-14.94 °C. Remarks:For the sample at 99.8%.
Boiling point or initial boiling point and boiling range	237.63 °C. Remarks:Under atmospheric pressure.
Flammability	Combustible. Gives off irritating or toxic fumes (or gases) in a fire.
Lower and upper explosion limit/flammability limit	no data available
Flash point	99 °C.
Auto-ignition temperature	896 °F. Remarks:Corresponding to 480 °C.
Decomposition temperature	no data available
pH	Weak tertiary base
Kinematic viscosity	dynamic viscosity (in mPa s) = 3.375. Temperature:24.85°C. Remarks:Corresponding to 25°C.;dynamic viscosity (in mPa s) = 2.201. Temperature:45°C. Remarks:Corresponding to 45°C.;dynamic viscosity (in mPa s) = 1.563. Temperature:65°C. Remarks:Corresponding to 65°C.
Solubility	Insoluble in water
Partition coefficient n-octanol/water	log Pow = 2.04. Temperature:22 °C. Remarks:No data on pH.
Vapour pressure	0.029 mm Hg. Temperature:12.62 °C. Remarks:Corresponding

	to 3.84 Pa.;0.043 mm Hg. Temperature:16.71 °C. Remarks:Corresponding to 5.68 Pa.;0.061 mm Hg. Temperature:21.35 °C. Remarks:Corresponding to 8.14 Pa.
Density and/or relative density	1.088 kg/dm ³ . Temperature:24.85°C.;1.073 kg/dm ³ . Temperature:45°C.;1.316 kg/dm ³ . Temperature:65°C.
Relative vapour density	4.5 (vs air)
Particle characteristics	no data available

SECTION 10: Stability and reactivity

10.1 Reactivity

Decomposes on heating and on burning. This produces toxic fumes including nitrogen oxides. Reacts with strong oxidants, acids and anhydrides.

10.2 Chemical stability

Darkens on storage in ordinary, stoppered bottle

10.3 Possibility of hazardous reactions

IT IS MODERATELY FLAMMABLE BUT DOES NOT EVOLVE A FLAMMABLE CONCEN OF VAPOR AT TEMP OF BELOW 99 DEG C. QUINOLINE is hygroscopic. It absorbs as much as 22% water. It is sensitive to light and moisture. It darkens on storage. This chemical is a weak base. A potentially explosive reaction may occur with hydrogen peroxide. It reacts violently with dinitrogen tetroxide. It also reacts violently with perchromates. It is incompatible with (linseed oil + thionyl chloride) and maleic anhydride. It is also incompatible with strong oxidizers and strong acids. This chemical can be unpredictably violent. It dissolves sulfur, phosphorus and arsenic trioxide. It may attack some forms of plastics. It is a preparative hazard. (NTP, 1992)

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

Violent reaction with dinitrogen tetroxide; perchromates.

10.6 Hazardous decomposition products

When heated to decomposition it emits toxic fumes of /nitrogen oxides/.

SECTION 11: Toxicological information

Acute toxicity

- Oral: LD50 Rat oral 460 mg/kg
- Inhalation: no data available
- Dermal: no data available

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

no data available

Reproductive toxicity

No information is available on the reproductive or developmental effects of quinoline in humans or animals.

STOT-single exposure

The substance is irritating to the eyes and skin.

STOT-repeated exposure

The substance may have effects on the liver. This substance is possibly carcinogenic to humans.

Aspiration hazard

A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20°C; on spraying or dispersing, however, much faster.

SECTION 12: Ecological information

12.1 Toxicity

- Toxicity to fish: LC50 - *Poecilia reticulata* - 29.9 mg/L - 96 h.
- Toxicity to daphnia and other aquatic invertebrates: LC50 - other aquatic mollusc: *Physa gyrina* - 183 mg/L - 48 h.
- Toxicity to algae: EC50 - *Desmodesmus subspicatus* (previous name: *Scenedesmus subspicatus*) - 84 mg/L - 72 h.
- Toxicity to microorganisms: EC50 - activated sludge of a predominantly domestic sewage - 243 mg/L - 3 h. Remarks: Respiration rate.

12.2 Persistence and degradability

With 9 natural water samples, 1 ppm quinoline had 3-10 day lag then 100% degradation in 24-48 hr; 1 ppm redose had 2-4 hr lag then 100% degradation in 24-48 hr(1). Using a 9 L aerated fermentor with 3 natural water samples and 1 sewage plant aeration effluent spiked with 10 ug/ml quinoline, an adaptation period was observed and greater than or equal to 95% biodegradation in 48 hr (25 deg C), 60 hr (25 deg C), 11 days (15 deg C) and 60 hours (25 deg C), respectively(2). Batch fermentations using low level inocula from a eutrophic pond initially spiked with 1,3,5 and 10 ug/ml quinoline resulted in 100% biodegradation in <16 hr(2). Major metabolites expected: 2-hydroxyquinoline, 2,3-dihydroxyquinoline(2). 66% theoretical BOD (TBOD) was observed after 5 days with the standard dilution method and sewage as seed(4). Using 100 ppm quinoline and 30 ppm activated sludge, < 30% TBOD was observed in 2 weeks(5). With 10 ug/ml quinoline with pond water in 9 l bottle, approximately 2 day lag period followed by 100% biodegradation in < 24 hr; four subsequent redoses in shaker flasks with 0.2% v/v (NH₄)₂SO₄ - potassium phosphate buffer resulted in 100% biodegradation in less than or equal to 24 hours(3). Bacterium isolated from soil used quinoline as sole carbon during aerobic degradation(6). Quinoline was degraded to 2-hydroxyquinoline by soil *Pseudomonads* in enrichment cultures isolated from a creosote-contaminated site in Pensacola, FL(7).

12.3 Bioaccumulative potential

At an initial concentration of 0.8 and 0.08 mg/l, quinoline had a BCF ranging from <0.1-2.5 and <1.0-3.8, respectively, in orange red killifish(1). Rainbow trout swimup fry, ranging from 0.21-0.41 g in size, were exposed to quinoline at 1 mg/l for 48 hours and analyzed for bioconcentration(2). Whole body levels of quinoline increased rapidly during the first 4 hours of exposure and reached an apparent plateau after about 24 hours. Quinoline had a calculated bioconcentration factor of 3.73. After 48 hours, the fish were placed in non-quinoline contaminated water for 24 hours and monitored for depuration(2). Less than 2% of unmetabolized quinoline remained after the 24-hour depuration period. Metabolites found within fish tissues included hydroxyquinolines and quinolinethiols(2). In a static exposure study using fathead minnows, *Pimephales promelas*, a bioconcentration factor (BCF) of 8 was measured(3). According to a classification scheme(4), these BCF values suggest the potential for bioconcentration in aquatic organisms is low(SRC).

12.4 Mobility in soil

The measured log K_{oc} for quinoline is 2.84(1). The adsorption coefficients of quinoline to Ca-montmorillonite and creek sediments are 7.3 and 10.9, respectively(2). A K_{oc} of 43 was reported using low-organic-carbon subsurface materials(11). According to a classification scheme(3), these K_{oc} values suggest that quinoline is expected to have very

high mobility in soil. Quinoline was found to be relatively mobile using a Danish sandy soil(10). Intensity of quinoline added to a natural sand aquifer on the Canadian Air Force Base Borden, Ontario, Canada via a field study using coal tar creosote were found to increase after 278 days, about 25 m from the creosote source, added at an initial concn of 10.1 g/kg creosote(4). Aromatic amines are expected to bind strongly to humus or organic matter in soils due to the high reactivity of the aromatic amino group(7,8), suggesting that mobility may be much lower in some soils(SRC). The pKa of quinoline is 4.90(5), indicating that this compound will partially exist in the protonated form in the environment and cations generally adsorb to organic carbon and clay more strongly than their neutral counterparts(6); therefore, adsorption increases with increasing soil acidity(11). Sorption onto airborne particulates has been observed(9). A Kd value of 0.83 was measured using a Danish sandy soil from Lundgaard, Jutland, characterized by 2.47% organic carbon content, 80.2% sand, 13.2% silt, 4.8% clay, and a pH of 5.8(10).

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: UN2656 (For reference only, please check.)

IMDG: UN2656 (For reference only, please check.)

IATA: UN2656 (For reference only, please check.)

14.2 UN Proper Shipping Name

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

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

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

14.3 Transport hazard class(es)

ADR/RID: 6.1 (For reference only, please check.)

IMDG: 6.1 (For reference only, please check.)

IATA: 6.1 (For reference only, please check.)

14.4 Packing group, if applicable

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

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

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

14.5 Environmental hazards

ADR/RID: Yes

IMDG: Yes

IATA: Yes

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
Quinoline	Quinoline	91-22-5	202-051-6
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

Health effects of exposure to the substance have not been investigated adequately. 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.