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# Safety Data Sheet

## 1. Chemical product and company identification

Product name : Quinoline

**Company information**

Name of manufacturer : KANTO CHEMICAL CO., INC.
Address : 2-1, Nihonbashi, Muromachi 2-Chome, Chuo-Ku, Tokyo, 103-0022, JP
Name of section : Business Administration Department, Reagent Division
Telephone number : +81-3-6214-1090
Facsimile number : +81-3-3241-1047
Mail address : BC32@kanto.co.jp

Reference No : 35012

Recommended use : For research use only

Restrictions on use : Seek expert judgment when using the product for applications other than those recommended.

## 2. Hazards identification

**GHS classification**

| | | |
|---|---|---|
| Health hazards | Acute toxicity (oral) | Category 3 |
| | Acute toxicity (dermal) | Category 3 |
| | Skin corrosion/irritation | Category 2 |
| | Serious eye damage/eye irritation | Category 2A |
| | Germ cell mutagenicity | Category 2 |
| | Carcinogenicity | Category 1B |
| | Specific target organ toxicity (single exposure) | Category 1 (nervous system) |
| | Specific target organ toxicity (single exposure) | Category 3 (narcosis) |
| | Specific target organ toxicity (single exposure) | Category 3 (respiratory tract irritation.) |
| | Specific target organ toxicity (repeated exposure) | Category 2 (nasal cavity, liver) |
| Environmental hazards | Aquatic acute | Category 1 |
| | Aquatic chronic | Category 1 |

Hazard pictograms



Signal word : Danger

Hazard statements : Toxic if swallowed or in contact with skin
Causes skin irritation
Causes serious eye irritation
May cause respiratory irritation
May cause drowsiness or dizziness

Suspected of causing genetic defects
May cause cancer
Causes damage to organs (nervous system)
May cause damage to organs (nasal cavity, liver) through prolonged or repeated exposure
Very toxic to aquatic life
Very toxic to aquatic life with long lasting effects

**Precautionary statements**

Prevention : Do not handle until all safety precautions have been read and understood.
Do not breathe mist/vapors.
Wash hands, forearms and face thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Avoid release to the environment.
Wear protective gloves/protective clothing/eye protection/face protection.

Response : IF SWALLOWED: Immediately call a POISON CENTER or doctor.
IF ON SKIN: Wash with plenty of water.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed or concerned: Call a POISON CENTER or doctor.
IF exposed or concerned: Get medical advice/attention.
Call a POISON CENTER or doctor if you feel unwell.
Get medical advice/attention if you feel unwell.
Rinse mouth.
If skin irritation occurs: Get medical advice/attention.
If eye irritation persists: Get medical advice/attention.
Take off immediately all contaminated clothing and wash it before reuse.
Take off contaminated clothing and wash it before reuse.
Collect spillage.

Storage : Store in a well-ventilated place. Keep container tightly closed.
Store locked up.

Disposal : Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

## 3. Composition/information on ingredients

Distinction of substance or mixture : Substance

Synonyms : 1-Benzazine

| Chemical name | Concentration (%) | Formula | TSCA | EC-No. | CAS RN |
|---|---|---|---|---|---|
| Quinoline | ≥ 95 | C9H7N | Listed | 202-051-6 | 91-22-5 |

＊Contains 0.5% or less of aniline as an impurity.

## 4. First aid measures

### First aid measures

| | | |
|---|---|---|
| First-aid measures after inhalation | : | Remove the victim to fresh air, and make him blow his nose and gargle. |
| First-aid measures after skin contact | : | Wash the affected areas under running water. |
| First-aid measures after eye contact | : | Wash the affected areas under running water for at least 15 minutes. If necessary, get medical treatment. |
| First-aid measures after ingestion | : | The chemical is volatile. Do not induce vomiting because it increases the risk of aspiration into the lungs. Get medical attention immediately. If necessary, rinse mouth with water. |
| Personal Protection in First Aid and Measures | : | Rescuers should wear proper protective equipment like rubber gloves, goggles. |

## 5. Fire fighting measures

| | | |
|---|---|---|
| Suitable extinguishing media | : | Dry chemical, CO2, dry sand, or alcohol-resistant foam |
| Unsuitable extinguishing media | : | Water spray, Foam extinguisher |
| Firefighting instructions | : | Move containers from fire area if it can be done without risk, if not possible, apply water from a safe distance to cool and protect surrounding area.<br>Fight fire from windward.<br>Dry chemical powder, carbon dioxide or dry sand should be used for small fires. Alcohol-resistant foam extinguisher is effective for a large scale fire. |
| Personal protection (Emergency response) | : | Wear breathing apparatus. |

## 6. Accidental release measures

### Personal Precautions, Protective Equipment and Emergency Procedures

| | | |
|---|---|---|
| General measures | : | Wear proper protective equipment and avoid contact with skin and inhalation of vapor. Conduct operations from upwind and evacuate people downwind. Remove all sources of ignition. Keep away personnel except for authorized ones from spillage area by stretching ropes. |

### Environmental precautions

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|---|---|---|
| Environmental precautions | : | Attention should be given to avoid damage to the environment by flowing of spillage to rivers. |

### Methods and Equipment for Containment and Cleaning up

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| For containment | : | Absorb spill with inert material (e.g, diatomaceous earth, sand) and flush spillage area with copious amounts of water. |
| Prevention Measures for Secondary Accidents | : | Remove nearby sources of ignition and prepare extinguishing media. |

## 7. Handling and storage

### Handling

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| Technical measures | : | Wear proper protective equipment to avoid contact with skin or inhalation of vapor. Pay attention to fire.<br>Ventilate well at working places. |

| | | |
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| Precautions for safe handling | : | Use with an enclosed system or a local exhaust ventilation. Use in well-ventilated areas.<br>Do not allow contact with oxidizing substances. |

**Storage**

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| Storage conditions | : | Store in a dark, cool place and tightly closed. |
| Material used in packaging/containers | : | Glass, fluorine resin, stainless steel. |

## 8. Exposure controls / Personal protection equipment

| | |
|---|---|
| ACGIH TWA | Not established |

| | | |
|---|---|---|
| Appropriate engineering controls | : | Use with an enclosed system or a local exhaust ventilation. |

**Protective equipment**

| | | |
|---|---|---|
| Respiratory protection | : | If necessary, wear chemical cartridge respirator with an organic vapor cartage |
| Hand protection | : | Impervious protective gloves |
| Eye protection | : | Safety goggles |
| Skin and body protection | : | Protective clothing, protective boots |

## 9. Physical and chemical properties

| | | |
|---|---|---|
| Physical state | : | Liquid |
| Color | : | Colorless - pale brown |
| Odor | : | Characteristic |
| pH | : | Weak alkalinity |
| Melting point | : | -15.6 ° C |
| Freezing point | : | No data available |
| Boiling point | : | 237.1 ° C |
| Flash point | : | 99 ° C (C.C.) |
| Auto-ignition temperature | : | 480 ° C |
| Decomposition temperature | : | No data available |
| Flammability | : | Flammable |
| Vapor pressure | : | 0.08 hPa (20℃) |
| Relative density | : | No data available |
| Density | : | 1.082 - 1.102 g/cm³ (20℃) |
| Relative gas density | : | 4.5 |
| Solubility | : | Organic solvents: Soluble in acetone, ethanol, diethyl ether.<br>Water: 0.65 % (20℃) |
| Partition coefficient n-octanol/water (log Pow) | : | 2.03 |
| Explosive limits (vol %) | : | 1.2 - 7 vol % |
| Viscosity, kinematic | : | 2.8 mm²/s (30℃) |
| Particle characteristics | : | No data available |

## 10. Stability and reactivity

| | | |
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| Reactivity | : | Form quaternary salts with alkyl halides, acetyl chloride. |

| | | |
|---|---|---|
| | | When reduced, it becomes 1,2-dihydroquinoline or 1,2,3,4-tetrahydroquinoline depending on the conditions.<br>When oxidized with peracid, it becomes N-oxide. |
| Chemical stability | : | Stable under normal conditions. Hygroscopic. It turns dark brown over time. |
| Possibility of hazardous reactions | : | May react violently when in contact with oxidaizing substances. |
| Conditions to avoid | : | Light, heat. |
| Incompatible materials | : | Oxidizing substances. |
| Hazardous decomposition products | : | Carbon monoxide, nitrogen oxides. |

## 11. Toxicological information

| | | |
|---|---|---|
| Acute toxicity (oral) | : | Toxic if swallowed<br>rat LD50=262mg/kg |
| Acute toxicity (dermal) | : | Toxic in contact with skin<br>rabbit LD50=590mg/kg |
| Acute toxicity (inhalation) | : | No classification (gas)<br>Classification not possible (vapor)<br>Classification not possible (dust, mist) |
| Skin corrosion/irritation | : | Causes skin irritation<br>There are descriptions that this substance irritates the skin and that exposure in rabbit skin causes moderate to severe irritation. From the above, it was classified into category 2. |
| Serious eye damage/irritation | : | Causes serious eye irritation<br>There is a description that eye exposure to this substance in rabbit eyes caused moderate to severe irritation. In addition, there are descriptions that this substance irritates eyes and that it may cause irreversible damage to human eyes. Therefore, this substance was classified into category 2A. |
| Respiratory sensitization | : | Classification not possible |
| Skin sensitization | : | No classification<br>In the mouse local lymph node assay (LLNA) according to TG 429, the SI value did not exceed 3 and was judged to be negative. |
| Germ cell mutagenicity | : | Suspected of causing genetic defects<br>As for in vivo, this substance was positive only in the liver but was negative in the bone marrow, testis, lung, kidney and spleen in the lac Z transgenic mouse gene mutation test, positive and negative in the rat bone marrow cell micronucleus test, negative in the rat liver micronucleus test, positive in the mouse bone marrow cell micronucleus test, negative in the mouse liver micronucleus test, positive in the chromosome aberration test and the sister chromatid exchanger test with rat liver, negative in the chromosome aberration test and the sister chromatid exchange test with mouse bone marrow, and equivocal in the rat liver unscheduled DNA synthesis test. As for in vitro, it was positive in a bacterial reverse mutation test, a mammalian cell gene mutation test, a mouse lymphoma test, a chromosomal aberration test and a sister chromatid exchange test. Based on the above, the substance was classified into category 2 because positive results were observed in in-vivo somatic cell mutagenicity tests, and negative results in in-vivo germ cell mutagenicity tests.<br>The substance is recognized to have mutagenicity by the Ministry of Health, Labor and Welfare. |

| | | |
|---|---|---|
| Carcinogenicity | : | May cause cancer<br>In a carcinogenicity study in which male and female rats were administered this substance in drinking water for 96 weeks and 104 weeks, respectively, a significant increase in the incidences of hepatocellular adenoma, hepatocellular carcinoma, and angiosarcoma of the liver was observed in all treatment groups for both males and females. In addition, in a carcinogenicity study in which the substance was administered to male and female mice for 104 weeks in drinking water, hemangiomas or angiosarcomas were observed in many animals in all treatment groups for both sexes. Clear evidence of carcinogenicity, including malignant tumors, was found in two animal species. Thus, it was classified into category 1B. |
| Reproductive toxicity | : | Classification not possible |
| STOT-single exposure | : | Causes damage to organs (nervous system)<br>May cause drowsiness or dizziness<br>May cause respiratory irritation<br>This substance causes weakness leading to lethargy, dyspnea and coma. Inhalation of this substance causes cough and sore throat, and ingestion of this substance causes sore throat. Thus, it was classified into category 1 (nervous system) and category 3 (narcosis, respiratory tract irritation). |
| STOT-repeated exposure | : | May cause damage to organs (nasal cavity, liver) through prolonged or repeated exposure<br>In a 13-week drinking water study in rats, increased liver and kidney weights at 158 ppm and above, decreased hemoglobin in males at 237 ppm and above, manifestation of olfactory ducts in the olfactory epithelium, and in males, decreases in red blood cell count and hematocrit, single-cell vacuolar degeneration of hepatic cells at 355 ppm and above, multinucleated changes in the supporting cells in the nasal cavity, olfactory epithelial atrophy at 533 ppm and above, decreased MCV, increased reticulocyte ratio in males at 800 ppm were observed. In a 16-40 week feeding administration study in male rats, increased liver weight, fatty degeneration of the liver, bile duct proliferation, and oval cell infiltration were observed at 0.05% and above, and nodular hyperplasia of the liver was observed at 0.1%. Thus, it was classified into category 2 (nasal cavity, liver). |
| Aspiration hazard | : | Classification not possible |

## 12. Ecological information

### Ecotoxicity

| | | |
|---|---|---|
| Aquatic acute | : | Very toxic to aquatic life<br>Pimephales promelas LC50=0.44mg/L/96h |
| Aquatic chronic | : | Very toxic to aquatic life with long lasting effects |

### Persistence and degradability

Not readily biodegradable
BOD : 0.2%

### Bioaccumulative potential

Low bioconcentration
BCF : ≤0.1-2.5 (0.8mg/L), ≤1.0-.38 (0.08mg/L)

**Mobility in soil**

High mobility
Koc : 2.84-10.9

**Hazardous to the ozone layer**

| | | |
|---|---|---|
| Ozone | : | Classification not possible |

## 13. Disposal considerations

| | | |
|---|---|---|
| Ecological waste information | : | Burn in a chemical incinerator equipped with an afterburner and a scrubber. Or entrust approved waste disposal companies with the disposal. |
| Contaminated container and packaging | : | In case of disposal of empty bottles, dispose bottles after removing the content thoroughly. |

## 14. Transport information

**International Regulations**

**Transport by sea(IMDG)**

| | | |
|---|---|---|
| UN-No. (IMDG) | : | 2656 |
| Proper Shipping Name (IMDG) | : | QUINOLINE |
| Packing group (IMDG) | : | III |
| Transport hazard class(es) (IMDG) | : | 6.1 |

**Air transport(IATA)**

| | | |
|---|---|---|
| UN-No. (IATA) | : | 2656 |
| Proper Shipping Name (IATA) | : | Quinoline |
| Packing group (IATA) | : | III |
| Transport hazard class(es) (IATA) | : | 6.1 |
| Marine pollutant | : | Applicable |
| MFAG-No | : | 154 |

## 15. Regulatory information

Regulatory information with regard to this substance in your country or region should be examined by your own responsibility.

## 16. Other information

| | | |
|---|---|---|
| Data sources | : | Solvents Handbook, T, Asahara el, Kodansha Scientific Ltd. (1976) .<br>Handbook of Dangerous Substances Springer-Verlag Tokyo (1991) .<br>Handbook of Poisonous and Deleterious substances, revised and enlarged edition, Yakumu Kohosa (2000) .<br>NITE Chemical Risk Information Platform (NITE-CHRIP), National Institute of Technology and Evaluation. |

The information contained herein is based on several references and the present state of our knowledge. However the SDS does not always cover all information about the product, handle the product carefully.The information is intended to ordinary usage, in case of particular handlings, conduct appropriate safety measurements.The information herein is only provision of information, and it does not represent a guarantee the properties of the product.The Safety Data Sheet(SDS) is prepared based on JIS Z7253.