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Safety Data Sheet

1. Chemical product and company identification

Product name : Benzonitrile

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 : +81-3-6214-1090Facsimile number : +81-3-3241-1047Mail address : BC32@kanto.co.jp

Reference No : 04119

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

Physical hazards Flammable liquids Category 4
Health hazards Acute toxicity (oral) Category 4
Acute toxicity (dermal) Category 4
Acute toxicity Category 3

(inhalation:vapors)

Specific target organ toxicity Category 1 (central nervous system, respiratory

(single exposure)

(repeated exposure)

Environmental Aquatic acute

hazards

Aquatic acute Category 3

Hazard pictograms





Signal word : Danger

Hazard statements : Combustible liquid

Harmful if swallowed or in contact with skin

Toxic if inhaled

Causes damage to organs (central nervous system, respiratory

organs)

May cause damage to organs (central nervous system) through

prolonged or repeated exposure

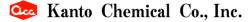
Harmful to aquatic life

Precautionary statements

Prevention : Keep away from heat, hot surfaces, sparks, open flames and other

ignition sources. No smoking. Do not breathe mist/vapors.

Wash hands, forearms and face thoroughly after handling.



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Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area.

Avoid release to the environment.

 $We ar \ protective \ gloves/protective \ clothing/eye \ protection/face$

protection.

Response : IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell.

IF ON SKIN: Wash with plenty of water.

IF INHALED: Remove person to fresh air and keep comfortable for

breathing.

IF exposed or concerned: Call a POISON CENTER or doctor.

Call a POISON CENTER or doctor.

Call a POISON CENTER or doctor if you feel unwell. Get medical advice/attention if you feel unwell.

Rinse mouth.

Take off contaminated clothing and wash it before reuse.

: 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

Storage

: Substance

Synonyms : Phenyl cyanide

Chemical name	Concentration (%)	Formula	TSCA	EC-No.	CAS RN
Benzonitrile	≥ 98	C7H5N	Listed	202-855-7	100-47-0

4. First aid measures

First aid measures

First-aid measures after

inhalation

: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately get medical treatment.

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.

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 powder, carbon dioxide, dry sand, foam

Unsuitable extinguishing media

: Water spray

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.

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Fight fire from windward.

Dry chemical powder, carbon dioxide or dry sand should be used for small fires. 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

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

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

Technical measures : Wear proper protective equipment to avoid contact with skin or

inhalation of vapor. Pay attention to fire.

Ventilate well at working places.

Precautions for safe handling : Avoid formation of vapor and aerosols.

Do not allow contact with oxidizing substances.

Storage

Storage conditions : Store in a dark, cool place and tightly closed.

Material used in

packaging/containers

: Glass, fluorine resin.

8. Exposure controls / Personal protection equipment

ACGIH TWA Not established

Appropriate engineering controls

ng

: Use with an enclosed system or a local exhaust ventilation.

Protective equipment

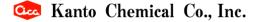
Respiratory protection : Chemical cartridge respirator with an organic vapor cartage or

airline respirator

Hand protection : Impervious protective gloves

Eye protection : Safety goggles

Skin and body protection : Protective clothing, protective boots



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9. Physical and chemical properties

Physical state : Liquid Color : Colorless.

Odor : Almond like odor pH : No data available

Melting point : -12.75 ° C

Freezing point : No data available

Boiling point : $191.1 \,^{\circ} \,^{\circ}$

Auto-ignition temperature : 550 $^{\circ}$ C

Decomposition temperature : No data available

Flammability : Flammable
Vapor pressure : 102 Pa (20°C)
Relative density : No data available

Density : $1.002 - 1.008 \text{ g/cm}^3 (20^{\circ}\text{C})$

Relative gas density : 3.6

Solubility : Organic solvents: Soluble in ethanol, diethyl ether.

Water: 0.1 - 0.5 % (22℃)

Partition coefficient n-

octanol/water (log Pow)

Explosive limits (vol %) : 1.4 - 7.2 vol %Viscosity, kinematic : $1.12 \text{ mm}^2/\text{s}$ (30°C) Particle characteristics : No data available

10. Stability and reactivity

Reactivity : Hydrolyzed with alkali hydroxide or hot inorganic acid to benzoic

acid.

: 1.56

Chemical stability : Stable under normal conditions.

Possibility of hazardous : May react violently when in contact with oxidaizing substances.

reactions

Conditions to avoid : Light, heat.

Incompatible materials : Oxidizing substances.

Hazardous decomposition : Carbon monoxide, nitrogen oxdes, hydrogen cyanide.

products

11. Toxicological information

Acute toxicity (oral) : Harmful if swallowed

rat LD50=700 mg/kg

Acute toxicity (dermal) : Harmful in contact with skin

 $rat\ LD50 = 1200 mg/kg$

Acute toxicity (inhalation) : No classification (gas)

Toxic if inhaled (vapor)

rat LC50=8mg/L/4h

Classification not possible (dust, mist)

Skin corrosion/irritation : No classification

A skin irritation test by the Draize method in rabbits concluded that it is mildly irritating and does not fall under the GHS

category.

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Serious eye damage/irritation

: No classification

In an eye irritation test using rabbits in accordance with FDA Fed. Reg., mild irritation of the conjunctiva was observed, but all disappeared after 7 days. The mean scores for corneal opacity, iris, conjunctival redness, and chemosis after 24/48/72 hours were

0, 0, 0.8, and 0.1, respectively.

Respiratory sensitization

Skin sensitization

Classification not possible : Classification not possible

A 48-hour occlusion patch test in humans using 2% benzonitrile/petrolatum showed no sensitization.

Germ cell mutagenicity : No classification

> As for in vivo, it was negative in micronucleus assay with mouse peripheral blood erythrocytes. As for in vitro, it was negative in bacterial reverse mutation test and mouse lymphoma assay, and positive in chromosome aberration test with cultured mammalian

cells.

Carcinogenicity Reproductive toxicity STOT-single exposure

Classification not possible

Classification not possible

Causes damage to organs (central nervous system, respiratory

organs)

A worker who was accidentally exposed to liquid of this substance on his head and clothing developed severe dyspnea, tonic convulsions, and loss of consciousness for 75 minutes, after which he recovered. In a single oral study in rats and mice, labored breathing, lethargy, tremor, convulsions, paralysis, muscle relaxation, and reflex failure were observed. There is no information on the minimum dose at which the effects were observed, but if the effects were observed around the LD50 value, it would be around 690-1500 mg/kg in rats and 1080-1242 mg/kg in mice, which

corresponds to category 2. In addition, in a single inhalation exposure study in rats and mice, labored breathing, incoordination, prostration, sedation, and coma were observed. Microscopic findings at autopsy showed focal lymphoid hyperplasia in the lungs with accumulation of foamy macrophages in rats, and congestion and edema in mice. The 4-hour equivalent exposure concentrations were 3.8 mg/L in rats and 2.7 mg/L in mice, corresponding to category 1. Thus, it was classified into category 1 (central nervous system,

respiratory organs).

STOT-repeated exposure May cause damage to organs (central nervous system) through

prolonged or repeated exposure

As a result of oral administration of 4-100 mg/kg for 28 days to rats, low cholinesterase activity, increased grooming, and restlessness were observed at 100 mg/kg. Thus, it was classified

into category 2 (central nervous system).

Aspiration hazard Classification not possible

12. Ecological information

Ecotoxicity

Aquatic acute : Harmful to aquatic life

Daphnia sp. EC50=30.93mg/L/24 h

Aquatic chronic : No classification

Persistence and degradability

Readily biodegradable

BOD : 63.4%



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Bioaccumulative potential

Low bioconcentration

BCF: 5

Mobility in soil

Moderate mobility

Koc : 151

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 $% \left(1\right) =\left(1\right) \left(1\right$

removing the content thoroughly.

14. Transport information

International Regulations

Transport by sea(IMDG)

UN-No. (IMDG) : 2224

Proper Shipping Name (IMDG) : BENZONITRILE

Packing group (IMDG) : II Transport hazard class(es) : 6.1

(IMDG)

Air transport (IATA)

UN-No. (IATA) : 2224

Proper Shipping Name (IATA) : Benzonitrile

Packing group (IATA) : II
Transport hazard class(es) : 6.1

(IATA)

Marine pollutant : Not applicable

MFAG-No : 152

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) .

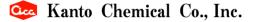
Encyclopaedia Chimica, Kyoritsu Shuppan Co, Ltd. (1963) . Handbook of Dangerous Substances Springer-Verlag Tokyo

(1991).

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



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it does not represent a guarantee the properties of the product. The Safety Data Sheet(SDS) is prepared based on JIS Z7253.