

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 : +81-3-6214-1090
 Facsimile number : +81-3-3241-1047
 Mail 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 (inhalation:vapors)	Category 3
	Specific target organ toxicity (single exposure)	Category 1 (central nervous system, respiratory organs)
	Specific target organ toxicity (repeated exposure)	Category 2 (central nervous system)
Environmental 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.



	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: 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.
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	: Phenyl cyanide

Chemical name	Concentration (%)	Formula	TSCA	EC-No.	CAS RN
Benzonitrile	≥ 98	C ₇ H ₅ N	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.



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
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Appropriate engineering controls : 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



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 ° C
Flash point	: 75 ° C (C.C.)
Auto-ignition temperature	: 550 ° C
Decomposition temperature	: No data available
Flammability	: Flammable
Vapor pressure	: 102 Pa (20°C)
Relative density	: No data available
Density	: 1.002 - 1.008 g/cm ³ (20°C)
Relative gas density	: 3.6
Solubility	: Organic solvents: Soluble in ethanol, diethyl ether. Water: 0.1 - 0.5 % (22°C)
Partition coefficient n-octanol/water (log Pow)	: 1.56
Explosive limits (vol %)	: 1.4 - 7.2 vol %
Viscosity, kinematic	: 1.12 mm ² /s (30°C)
Particle characteristics	: No data available

10. Stability and reactivity

Reactivity	: Hydrolyzed with alkali hydroxide or hot inorganic acid to benzoic acid.
Chemical stability	: Stable under normal conditions.
Possibility of hazardous reactions	: May react violently when in contact with oxidizing substances.
Conditions to avoid	: Light, heat.
Incompatible materials	: Oxidizing substances.
Hazardous decomposition products	: Carbon monoxide, nitrogen oxides, hydrogen cyanide.

11. Toxicological information

Acute toxicity (oral)	: Harmful if swallowed rat LD50=700mg/kg
Acute toxicity (dermal)	: Harmful in contact with skin rat LD50=1200mg/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.



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	: Classification not possible
Skin sensitization	: 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	: Classification not possible
Reproductive toxicity	: Classification not possible
STOT-single exposure	: 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%



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 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) (IMDG) : 6.1

Air transport(IATA)

UN-No. (IATA) : 2224
 Proper Shipping Name (IATA) : Benzonitrile
 Packing group (IATA) : II
 Transport hazard class(es) (IATA) : 6.1

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 et al, 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



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

