Date of issue: 2017/06/28
Date of revision: 2024/09/18

Safety Data Sheet

Section 1. Identification of the substance/mixture and of the company/undertaking

Product identifier:
Product name: 1,4-Benzoquinone(p-)
SDS No. : 0807E-3
Relevant identified uses of the substance or mixture and uses advised against
Research and Development
Details of the supplier of the safety data sheet
Manufacturer/Supplier: KISHIDA CHEMICAL CO., LTD.
Address: 3-1, Honmachibashi, Chuo-ku, Osaka, JAPAN
Division: Chemical Safety Management Department
Telephone number: +81-6-6946-8061
FAX: +81-6-6946-1607

Section 2. Hazards identification

GHS classification and label elements of the product
Classification of the substance or mixture
HEALTH HAZARDS
Acute toxicity (Oral): Category 3
Skin corrosion/irritation: Category 2
Serious eye damage/eye irritation: Category 2
Skin sensitization: Category 1
Germ cell mutagenicity: Category 1B
Specific target organ toxicity - single exposure: Category 1 (central nervous system)
Specific target organ toxicity - single exposure: Category 3 (Respiratory tract irritation)
ENVIRONMENT HAZARDS
Hazardous to the aquatic environment, short-term (acute): Category 1
Hazardous to the aquatic environment, long-term (chronic): Category 1
(Note) GHS classification without description: Not classified/Classification not possible
Label elements

Signal word: Danger
HAZARD STATEMENT
H301 Toxic if swallowed
H315 Causes skin irritation
H319 Causes serious eye irritation
H317 May cause an allergic skin reaction
H340 May cause genetic defects
H370 Causes damage to organs (central nervous system)
H335 May cause respiratory irritation
H410 Very toxic to aquatic life with long lasting effects
PRECAUTIONARY STATEMENT
Prevention

P202 Do not handle until all safety precautions have been read and understood.
P273 Avoid release to the environment.
P260 Do not breathe dust/fume/gas/mist/vapors/spray.
P271 Use only outdoors or in a well-ventilated area.
P264 Wash contaminated parts thoroughly after handling.
P280 Wear protective gloves.
P272 Contaminated work clothing should not be allowed out of the workplace.
P280 Wear eye protection/face protection.
P280 Use personal protective equipment as required.
P270 Do not eat, drink or smoke when using this product.

Response

P391 Collect spillage.
P308 + P313 IF exposed or concerned: Get medical advice/attention.
P312 Call a POISON CENTER/doctor/physician if you feel unwell.
P308 + P311 IF exposed or concerned: Call a POISON CENTER/doctor/physician.
P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P333 + P313 If skin irritation or rash occurs: Get medical advice/attention.
P362 + P364 Take off contaminated clothing and wash it before reuse.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313 If eye irritation persists: Get medical advice/attention.
P330 IF SWALLOWED: Rinse mouth.
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor/physician.

Storage

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.

Disposal

P501 Dispose of contents/container in accordance with local/national regulation.

Specific adverse human health effects

See "11. Toxicological Information".

Section 3. Composition/information on ingredients

Mixture/Substance selection:

Substance

Ingredient name	Content (%)	CAS No.	ENCS	Chemical formula
1,4-Benzoquinone(p-)	98(min)	106-51-4	3-1001	C6H4O2

Note : The figures shown above are not the specifications of the product.

Impurities

Hydroquinone <1.0% (CAS No.123-31-9)
Toluene <0.30% (CAS No.108-88-3)

Section 4. First-aid measures

Descriptions of first-aid measures

General measures

IF exposed or concerned: Get medical advice/attention.

Call a POISON CENTER/doctor/physician if you feel unwell.

IF INHALED

Remove person to fresh air and keep comfortable for breathing.

Call a POISON CENTER/doctor/physician if you feel unwell.

IF ON SKIN

Take off immediately all contaminated clothing. Rinse skin with water or shower.

Wash with plenty of soap and water.

If skin irritation or rash occurs: Get medical advice/attention.

IF IN EYES

Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

If eye irritation persists: Get medical advice/attention.

IF SWALLOWED

Rinse mouth.

Immediately call a POISON CENTER/doctor/physician.

Call a POISON CENTER/doctor/physician if you feel unwell.

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

Use appropriate extinguishing media suitable for surrounding facilities.

In case of fire, use water mist or loaded liquid, foam, inactive gases, dry powder, dry sand to extinguish.

*Fire Service Act Combustible solids or synthetic resins

Unsuitable extinguishing media

Extinguisher which discharge dry chemical fire extinguishing agents-Others (except for phosphates etc., hydrogen carbonates etc.)

*Ministerial Ordinance for Enforcement of the Fire Service Act (Appended Table 2) Combustible solids or synthetic resins

Specific hazards arising from the substance or mixture

Fire may produce irritating, corrosive and/or toxic gases.

Runoff from fire control or dilution water may cause pollution.

See "10.Stability and Reactivity".

Advice for firefighters

Specific fire-fighting measures

Evacuate non-essential personnel to safe area.

Special protective equipment and precautions for fire-fighters

Wear fire resistant or flame retardant clothing.

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

Firefighters should wear self-contained breathing apparatus with a full facepiece operated in the positive pressure mode.

Section 6. Accidental release measures

Personnel precautions, protective equipment and emergency procedures

Keep unauthorized personnel away.

Ventilate area until material pick up is complete.

Wear proper protective equipment.

Environmental precautions

Prevent spills from entering sewers, watercourses, low areas or rivers. To be careful not discharged to the environment without being properly handled waste water contaminated.

Methods and materials for containment and cleaning up

Sweep up, place in a bag and hold for waste disposal.

Preventive measures for secondary accident

Collect spillage.

Section 7. Handling and storage

Precautions for safe handling

Preventive measures

(Exposure Control for handling personnel)

Do not breathe dust/fume/gas/mist/vapors/spray.

(Protective measures against fire and explosion)

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

(Exhaust/ventilator)

Exhaust/ventilator should be available.

(Safety treatments)

Avoid contact with skin.

Avoid contact with eyes.

Safety Measures

Do not handle until all safety precautions have been read and understood.

Use only outdoors or in a well-ventilated area.

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

Wash hands et al thoroughly after handling.

When using do not eat, drink or smoke.

Any incompatibilities

See "10.Stability and Reactivity".

Advice on general occupational hygiene

Wash contaminated parts thoroughly after handling.

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

Contaminated work clothing should not be allowed out of the workplace.

Take off contaminated clothing and wash it before reuse.

Storage

Conditions for safe storage

Keep container tightly closed.

Store locked up. (P405)

Store in a cool, dry place. Do not store in direct sunlight.

Keep container protect from light.

Storage in accordance with local/national regulation.

Container and packaging materials for safe handling

Use closed unbreakable containers.

Section 8. Exposure controls/personal protection

Control parameters

Control value and Concentration standard value

(Hydroquinone)

Concentration standard value TWA: 1mg/m3

(Toluene)
Japan control value 20ppm
Adopted value
(Toluene)
JSOH(2013) 50ppm; 188mg/m3 (skin)
(1,4-Benzoquinone(p-))
ACGIH(2022) TWA: 0.1ppm, SL 5ug/100cm2 (Eye & URT irr; ocular eff)
(Hydroquinone)
ACGIH(2014) TWA: 1mg/m3 (Eye irr; eye dam)
(Toluene)
ACGIH(2020) TWA: 20ppm (CNS, visual, & hearing impair; female repro system eff; pregnancy loss)
[ACGIH] Notation
(1,4-Benzoquinone(p-))
DSEN
(Hydroquinone)
DSEN
(Toluene)
OTO

Exposure controls
Appropriate engineering controls
Do not use in areas without adequate ventilation.
Eye wash station should be available.
Washing facilities should be available.
Individual protection measures
Recommend to use protective equipment in conformity with the standards.
Use appropriate protective equipment in accordance with local/national regulation.
Respiratory protection
Wear respiratory protection (dust-proof mask/gas mask). Select chemical cartridge corresponding to type of gases when using a gas mask.
Hand protection
Wear impervious protective glove.
Eye protection
Wear eye/face protection. Wear safety goggles in cases gas is generated.
Skin and body protection
Wear protective clothing.

Section 9. Physical and Chemical Properties

Information on basic physical and chemical properties
Physical state: Crystals
Color: Yellow to green brown
Odor: Pungent odor
Melting point/Freezing point: 116℃
Boiling point or initial boiling point: (1,4-Benzoquinone(p-))ca. 180℃
Boiling range data is not available.
Flammability (gases, liquids and solids) data is not available.
Lower and upper explosion limit/flammability limit data is not available.
Flash point: (1,4-Benzoquinone(p-))38 through 93℃
Auto-ignition temperature: (1,4-Benzoquinone(p-))560℃

Decomposition temperature data is not available.
pH data is not available.
Kinematic viscosity data is not available.
Solubility:
Solubility in water: Poor
Solubility in solvent data is not available.
n-Octanol/water partition coefficient: log Pow0.2
Vapor pressure: 12 Pa (20 ℃)
Density and/or relative density data is not available.
Relative vapor density (Air=1): 3.7
Relative density of the Vapor/air - mixture at 20℃ (Air = 1): 1
Particle characteristics data is not available.
Other information
Other information is not available.

Section 10. Stability and Reactivity

Reactivity
Not available.
Chemical stability
Can sublime even at room temperature. (ICSC 0779)
Possibility of hazardous reactions
Dust explosion possible if in powder or granular form, mixed with air. If dry, it can be charged electrostatically by swirling, pneumatic transport, pouring, etc.
Decomposes above 60℃ when moist. This produces carbon monoxide. The substance is a weak oxidant. It reacts violently with some combustible substances, reducing agents and strong bases. (ICSC 0779)
Conditions to avoid
Contact with incompatible materials.
Contact with fire source.
Incompatible materials
Strong bases, Reducing agents, Combustible materials
Hazardous decomposition products
Carbon oxides

Section 11. Toxicological Information

Information on toxicological effects
Acute toxicity
Acute toxicity (Oral)
[Product]
Category 3, Toxic if swallowed
[Data for components of the product]
[GHS Cat. Japan, base data]
(1,4-Benzoquinone(p-))
rat LD50=130mg/kg (ACGIH 7th, 2001)
(Hydroquinone)
rat LD50=390mg/kg (SIDS, Access on Apr. 2012)
Acute toxicity (Inhalation)
[Data for components of the product]

[GHS Cat. Japan, base data]
(Toluene)
vapor: rat LC50=3319-8800ppm/4hr (EU-RAR, 2003) et al.

Irritant properties

Skin corrosion/irritation

[Product]
Category 2, Causes skin irritation

[Data for components of the product]
[GHS Cat. Japan, base data]
(1,4-Benzoquinone(p-))
human severe irritation (HSDB, Access on June 2019)
(Toluene)
rabbit moderate irritation (EU-RAR, 2003)

Serious eye damage/irritation

[Product]
Category 2, Causes serious eye irritation

[Data for components of the product]
[GHS Cat. Japan, base data]
(1,4-Benzoquinone(p-))
solid, high concentration solution: strong eye irritant (PATTY 6th, 2012)
(Hydroquinone)
rabbit corrosive damage (DFGMAK-Doc. 10, 1998)
(Toluene)
rabbit slight eyes irritation (EU-RAR, 2003)

Sensitization

Skin sensitization

[Product]
Category 1, May cause an allergic skin reaction

[Data for components of the product]
[GHS Cat. Japan, base data]
(1,4-Benzoquinone(p-))
cat. 1A; PATTY 6th. 2012
(Hydroquinone)
cat. 1; EHC 157, 1994

Germ cell mutagenicity

[Product]
Category 1B, May cause genetic defects

[Data for components of the product]
[GHS Cat. Japan, base data]
(1,4-Benzoquinone(p-))
cat. 2; IARC 71, 1999
(Hydroquinone)
cat. 1B; EHC 157, 1994

Carcinogenicity

[Data for components of the product]
[GHS Cat. Japan, base data]
(Hydroquinone)
cat.2; ACGIH A3 (ACGIH, 2008 et al.)
[IARC]
(1,4-Benzoquinone(p-))

Group 3 : Not classifiable as to its carcinogenicity to humans
(Hydroquinone)
Group 3 : Not classifiable as to its carcinogenicity to humans
(Toluene)
Group 3 : Not classifiable as to its carcinogenicity to humans
[ACGIH]
(1,4-Benzoquinone(p-))
A4(2022) : Not Classifiable as a Human Carcinogen
(Hydroquinone)
A3(2014) : Confirmed Animal Carcinogen with Unknown Relevance to Humans
(Toluene)
A4(2020) : Not Classifiable as a Human Carcinogen
[EU]
(Hydroquinone)
Category 2; Substances suspected human carcinogens

Reproductive toxicity

[Data for components of the product]
[GHS Cat. Japan, base data]
(Toluene)
cat. 1A; NITE Initial Risk Assessment Report 87, 2006
cat. add; SIDS(J), Access on Apr. 2012

Specific target organ toxicity (STOT)

STOT-single exposure

[Product]
Category 1, Causes damage to organs
Category 3, May cause respiratory irritation
[Data for components of the product]
[cat.1]
[GHS Cat. Japan, base data]
(1,4-Benzoquinone(p-))
central nervous system (IARC 15, 1977; HSDB, Access on June 2019)
[cat.3 (respiratory tract irritation)]
[GHS Cat. Japan, base data]
(1,4-Benzoquinone(p-))
respiratory tract irritation (IARC 15, 1977; PATTY 6th, 2012)
(Toluene)
respiratory tract irritation (PATTY 5th, 2001)
[cat.3 (narcotic effects)]
[GHS Cat. Japan, base data]
(Toluene)
narcotic effect (EHC 52, 1985; IARC 47, 1989)

STOT-repeated exposure data is not available.

Aspiration hazard

[Data for components of the product]
[cat.1]
[GHS Cat. Japan, base data]
(Toluene)
cat. 1; hydrocarbon, kinematic viscosity =0.86 mm2/s (40℃) (cal.) (Dynamic viscosity : 0.727 mPa・s (Renzo,1986), Density : 0.8483 g/mL (CRC 91st, 2010))

Section 12. Ecological Information

Toxicity

Aquatic toxicity

[Product]

Category 1, Very toxic to aquatic life

Category 1, Very toxic to aquatic life with long lasting effects

[Data for components of the product]

Hazardous to the aquatic environment, short-term (acute)

[GHS Cat. Japan, base data]

(1,4-Benzoquinone(p-))

Fish (Pimephales promelas) LC50=0.045mg/L/96hr (ECETOC TR91, 2003)

(Hydroquinone)

Fish (Pimephales promelas) LC50=0.044mg/L/96hr (NITE Initial Risk Assessment Report, 2008)

(Toluene)

Crustacea (Ceriodaphnia dubia) EC50=3.78mg/L/48hr (NITE Initial Risk Assessment Report, 2006)

Hazardous to the aquatic environment, long-term (chronic)

[GHS Cat. Japan, base data]

(Hydroquinone)

Crustacea (Daphnia magna) NOEC=0.003mg/L/21days; Algae (Pseudokirchneriella subcapitata) NOEC=0.0015mg/L/72hr (MOE Environmental Risk Assessment for Chemical Substances Vol.10, 2012)

(Toluene)

Crustacea (Ceriodaphnia dubia) NOEC=0.74mg/L/7days (NITE Initial Risk Assessment Report, 2006)

Water solubility

(1,4-Benzoquinone(p-))

poor (ICSC, 1997)

(Hydroquinone)

5.9 g/100 ml (15℃) (ICSC, 2001)

(Toluene)

none (ICSC, 2002)

Persistence and degradability

[Data for components of the product]

(1,4-Benzoquinone(p-))

Not rapidly degradable (BIOWIN)

(Hydroquinone)

BOD_Degradation : 70% (METI existing chemical safety inspections)

(Toluene)

BOD_Degradation : 123% (METI existing chemical safety inspections)

Bioaccumulative potential

[Data for components of the product]

(1,4-Benzoquinone(p-))

log Pow=0.2 (PHYSPROP DB, 2005)

(Hydroquinone)

log Pow=0.59 (PHYSPROP DB, 2009)

(Toluene)

log Kow=2.73 (PHYSPROP DB, 2008)

Mobility in soil

Mobility in soil data is not available.

Other adverse effects

Ozone depleting chemical data is not available.

Section 13. Disposal considerations

Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging

Waste treatment methods

Avoid release to the environment.

Dispose of contents/container as industrial waste. Accordance with local/national regulation.

Section 14. Transport Information

UN Number or ID Number : 2587

UN Proper Shipping Name :

BENZOQUINONE

Class or division (Transport hazard class) : 6.1

Packing group : II

ERG GUIDE No.: 153

IMDG Code (International Maritime Dangerous Goods Regulations)

UN Number or ID Number : 2587

UN Proper Shipping Name :

BENZOQUINONE

Class or division (Transport hazard class) : 6.1

Packing group : II

IATA (Dangerous Goods Regulations)

UN Number or ID Number : 2587

UN Proper Shipping Name :

BENZOQUINONE

Class or division (Transport hazard class) : 6.1

Hazard labels : Toxic

Packing group : II

Environmental hazards

Marine pollutants (yes/no) : yes

Section 15. Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture

U.S. Toxic Substances Control Act (TSCA) Inventory

Chemicals listed in TSCA Inventory

1,4-Benzoquinone(p-); Toluene; Hydroquinone

Other regulatory information

Ensure this material in compliance with federal requirements and ensure conformity to local regulations.

Section 16. Other information

References and sources for data

Globally Harmonized System of classification and labelling of chemicals, UN Recommendations on the TRANSPORT OF DANGEROUS GOODS 22nd edit., 2021 UN
IMDG Code, 2022 Edition (Incorporating Amendment 41-22)
IATA Dangerous Goods Regulations (65th Edition) 2024
2020 EMERGENCY RESPONSE GUIDEBOOK (US DOT)
2024 TLVs and BEIs. (ACGIH)
JIS Z 7252 : 2019
JIS Z 7253 : 2019
2023 Recommendation on TLVs (JSOH)
Supplier's data/information

General Disclaimer

All chemicals have unknown hazard. Handle the product with care.
This data sheet was created based on the information we currently have and may be revised according to new information. In addition, the precautions apply only to normal handling, and in the case of special handling, please make adequate countermeasure to maintain your safety.
The data given here is based on current knowledge and experience. The purpose of this Safety Data Sheet is to describe the products in terms of their safety requirements. The data does not signify any warranty with regard to the products' properties.
The GHS classification data given here is based on current Japan official data (NITE published in 2022).