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Safety Data Sheet

1. Product and company identification

Product name : DEHYDRATED SOLVENT K
Part No. : D312135-1
Name of manufacturer : HIRANUMA Co., Ltd.
Address : 1739 Motoyoshida, Mito, Ibaraki, 310-0836, JAPAN
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2. Summary of danger and Hazard

GHS classification

Physical and chemical hazard

Flammable liquids : Out of category
Pyrophoric liquids : Out of category

Human health hazard

Acute toxicity (oral)
: Category 3
Acute toxicity (dermal)
: Category 2
Acute toxicity (inhalation: vapors)
: Category 2
Skin corrosion/Irritation
: Category 2
Serious eye damage/eye irritation
: Category 1
Germ cell mutagenicity
: Category 2
Carcinogenicity : Category 1A
Reproductive toxicity
: Category 2
Specific target organ systemic toxicity (single exposure)
: Category 1, Category 3 (anesthetic action)
Specific target organ systemic toxicity (repeated exposure)

: Category 1

Environmental hazard

Hazardous to the aquatic environment-acute hazard

: Category 3

Hazardous to the aquatic environment-chronic hazard

: Category 1

Pictogram or symbol

Signal word : Danger

Hazard statement : Toxic if swallowed
Fatal in contact with skin
Fatal if inhaled
Causes skin irritation
Causes serious eye damage
Suspected of causing genetic defects
May cause cancer
Suspected of damaging fertility or the unborn child
Causes damage to organs (central nervous system, blood, respiratory organs, liver, kidney)
May cause drowsiness and dizziness
Causes damage to organs (central nervous system, blood, kidney, liver, respiratory organs) through prolonged or repeated exposure
Harmful to aquatic life
Very toxic to aquatic life with long lasting effects

Cautions

Safety measurements

: Do not handle until all safety precautions have been read and understood.
Do not breathe dust, mist, and vapor.
Do not get in eyes, on skin, or on clothing.
Use only in a well-ventilated area.
Avoid release to the environment.
Do not eat, drink or smoke when using this product.
Wear appropriate protective gloves, glasses, clothing, face shield, or mask.

Wash protective equipment thoroughly after use.
Wash hands thoroughly after handling.

First-aid measures : If inhaled : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately get medical treatment.
If swallowed: Induce vomiting, if possible, and rinse mouth. Immediately get medical treatment.
If in eyes : Rinse cautiously with water for several minutes. Get medical treatment.
If on skin : Remove contaminated clothing and the substance. Immediately get medical treatment.
If exposed, get medical treatment.
Get medical treatment, if you feel unwell.
Collect leakage

Storage : Tightly container closed and store in a well-ventilated area. Store locked up.

Disposal : Dispose of contents and containers appropriately in accordance with related regulations.

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3. Composition/Information on ingredients

Substance/Mixture
: Mixture

Chemical name or commercial name
: Chloroform, 2-Chloroethanol

Synonyms : 2-Chloroethanol:ethylenechlorohydrin

Ingredients and composition
: Chloroform 55%, 2-Chloroethanol 45%

Chemical formula : Chloroform $CHCl_3$
2-Chloroethanol $ClCH_2CH_2OH$

CAS No. : Chloroform 67-66-3
2-Chloroethanol 107-07-3

TSCA Inventory : Chloroform Registered
2-Chloroethanol Registered

EINECS No. : Chloroform 2006638
2-Chloroethanol 2034597

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4. First aid measures

Inhalation : Remove the victim to fresh air, and make him blow his nose and gargle.

Skin contact　: Wash the affected areas under running water.

Eye contact　: Wash the affected areas under running water for at least 15 minutes. Get medical treatment.

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.

Anticipated acute and delayed symptoms

: Inhalation may causes cough, dizziness, lethargy, sensory paralysis, headache, nausea, vomiting, unconsciousness these symptoms may be late to develop. these symptoms may be late to develop.

Protection for first aid person

: Rescuers should wear proper protective equipment like rubber gloves, goggles.

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5. Fire fighting measures

Extinguishing media　: Dry chemical powder, carbon dioxide, dry sand, foam

Prohibited extinguishing media

: Water spray

Danger and hazards under fire

: Thermal decomposition emits harmful chlorine, hydrogen chloride, phosgene gas.

Particular fire fighting

: 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.

Protection for firefighters

: Firefighters should wear protective equipment.

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6. Accidental release measures

Cautions for personnel

: Wear proper 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.

Cautions for environment

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

Removal measure : Absorb spill with inert material (e.g., diatomaceous earth, sand) and flush spillage area with copious amounts of water.

7. Cautions of handling and storage

Handling

Engineering measures

: Wear proper protective equipment to avoid contact with skin or inhalation of vapor.

Cautions for safety handling

: Use with an enclosed system or a local exhaust ventilation. Use in well-ventilated areas.

Storage

Adequate storage condition

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

Safety adequate container materials

: Glass, fluorine resin

Do not use vinyl chloride resin, polyethylene, synthetic rubber etc.

8. Exposure control/Personal protection

Engineering measures

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

Control parameters

ACGIH(2015) : 10ppm(as chloroform)(TLV-TWA)

1ppm(upper limit)(as 2-chloroethanol)(TLV-STEL)

Protective equipment

Respiration protective equipment

: If necessary, wear chemical cartridge respirator with an organic vapor cartage

Hands protective equipment

: Impervious protective gloves

Eyes protective equipment

: Safety goggles

Skin and body protective equipment

: Protective clothing, protective boots

9. Physical and chemical properties

Appearance	: Liquid
Color	: Colorless - pale yellow
Odor	: Sweet acrid odor
Odor threshold	: 30ppm(as chloroform)
Boiling point	: 61.15 °C(as chloroform)
Melting point	: -63.55 °C(as chloroform)
Flash point	: Noncombustible
Vapor pressure	: 212hPa (20 °C)(as chloroform)
Vapor density	: 3.6
Density	: 1.34g/cm^3 (20 °C)
Solubility	
Solubility in solvents	
	: Water ; Soluble
	Organic solvents; Readily soluble in ethanol, diethyl ether.
log Pow	: 1.97 (as chloroform)

10. Stability and reactivity

Stability	: Decomposes by light or heat and emits harmful phosgene.
Reactivity	: If contacted with strong alkaline solution, may cause explode.
Incompatible conditions	
	: Light, heat
Incompatible materials	: Oxidizing substances
Hazardous decomposition products	
	: Carbon monoxide, Chlorine, Hydrogen chloride, Phosgene

11. Toxicological information

Acute toxicity : Toxic if swallowed(category 3)
Fatal in case of contact with skin(category 2)
Fatal if inhaled(vapor)(category 2)
Inhalation (dust, mist) : Not possible to classify because of insufficient data.
(as Chloroform)
rat oral LD50=440mg/kg
rabbit skin LDLo>3980mg/kg
rat inhalation LC50=9636ppm/4H(vapor)
(as 2-Chloroethanol)

rat oral LD50=71mg/kg
rabbit skin LD50=67mg/kg
mouse inhalation LC50=0.3mg/L(vapor)

Skin corrosion/irritation
: Causes skin irritation(category 2)
Based on the description of the result of the skin irritation test using rabbits that chloroform causes slight congestion in the skin, moderate skin necrosis and incrustation, the classification is set into category 1A.

Serious eye damage/eye irritation
: Causes serious eye damage(category 1)
Based on thedescription of the result of eyes irritation test using rabbits that chloroform causes severe eye irritation, with mydriasis and keratitis. Translucent zones in the cornea were observed in four animals and a purulent hemorrhagic discharge was also reported (number of rabbits unknown). it was classified into category 1.

Respiratory sensitization or Skin sensitization
: Respiratory sensitization : Not possible to classify because of insufficient data.
Skin sensitization : Not possible to classify because of insufficient data.

Mutagenicity : Suspected of causing genetic defects(category 2)
Based on positive data of chloroform on somatic cell mutagenicity tests in vivo (micronucleus and chromosome aberration tests), and 2-chloroethanol has positive result from in vivo chromosome aberration tests in rat bone-marrow (inhalation). the classification is set to category 2.

Carcinogenic effects : May cause cancer(category 1A)
Since there is the proof about 2-chloroethanol that it is carcinogenic to humans in epidemiological data, it is set to category 1A.

Effects on the reproductive system
: Suspected of damaging fertility or the unborn child(category 2)
Based on the evidence about chloroform of a decline in fertility, a decrease in crown-rump length, delayed calcification of the skull and lumbar ribs, an increase in cleft palate, malformation of the interperietal bone, increased incidence of

anuary, brachyury and anal atresia within a litter, subcutaneous edema and increased rates of absorbed embryos at dosing levels toxic to parent animals in mouse three-generation tests and rat and mouse teratogenicity tests.

Specific target organ systemic toxicity single exposure

: Cause damage to organs (central nervous system, blood, cardiovascular, respiratory organs, liver, kidneys)(category 1)
May cause drowsiness and dizziness(category 3)
Based on the human evidence of chloroform including necrosis of hepatic cells, liver damage, jaundice, hypertrophy of the liver, kidney damage, stertorous respiration, cyanosis and excessive sweating and the evidence from animal studies including centrilobular fatty infiltration and necrosis of the liver, piloerection, sedation, musclar relaxation, ataxia, debility, partially watery eyes and necrosis of proximal convoluted tubules.
The effects of 2-chloroethanol on the central nervous system, cardiovascular system, renal, lung, and liver are observed. And there is the description that the substance irritates the airway seriously. Moreover the anesthetic by inhalation is indicated.

Specific target organ systemic toxicity repeated exposure

: Cause damage to organs (central nervous system, blood, kidneys, liver, respiratory organs) through prolonged or repeated exposure(category 1)
Based on the human evidence of chloroform including fatigue, thirst, gastrointestinal pain, frequent and painful urination, difficulty in concentration, depression, irritability, jaundice caused by liver damage after exposure to chloroform.
The effects of 2-chlororethanol on blood, kidney, liver were observed.

Aspiration hazard　: Not possible to classify because of insufficient data.

12. Ecological information

Ecotoxicity

Fish toxicity　: Harmful to aquatic life(category 3)
Very toxic to aquatic life with long lasting effects(category 1)
(as Chloroform)
Chlamydomonas EC50=13.3mg/L/72H
Fish(rainbow trout) NOEC=0.059mg/L/72H

Persistence and degradability

: Chloroform has no biodegradability.
0% by BOD

Bioaccumulative potential
: Chloroform is considered low or non bioaccumulativity or residualibity in fish or shells.
Concentration Carp 1.4-4.7 fold(1mg/L)
Carp 4.1-13 fold(0.1mg/L)

Mobility in soil : Chloroform may transfer to the atmosphere, the aquatic environment, and soil environment based on its physicochemical properties.

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13. Disposal consideration

Residual disposal : Mix the material with combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber as possible as high temperature. Or else consult approved disposal companies.

<Note> : Alkaline solution should be used for cleaning liquid of the scrubber. The incinerator should be suitable for burning organic halogen compounds.

Containers : In case of disposal of empty bottles, dispose bottles after removing the content thoroughly.

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14. Transport information

UN class : Class 6.1(Toxic substances) P. G. Ⅰ

UN number : 2810

Marine regulation information

UN No. : 2810

Proper shipping name
: TOXIC LIQUID, ORGANIC, N.O.S.

Class : 6.1

Sub risk : -

Packing group : Ⅰ

Marine pollutant : Not applicable

Aviation regulation information

UN No. : 2810

Proper shipping name
: Toxic liquid, organic, n.o.s.

Class : 6.1

Sub risk : -

Packing group　　: I

15. Regulatory information

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

16. Other information

References

1) Company data on file (SDS provided by manufacturer)
2) NITE: 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, and it has the same required elements on the Material Safety Data Sheet(MSDS) which is prepared based on JIS Z7250:2010.