Date of issue: 2017/07/11
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Safety Data Sheet

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

Product identifier:
Product name: Vanadium(V) oxide
SDS No. : 8416E-4
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
Acute toxicity (Inhalation): Category 2
Serious eye damage/eye irritation: Category 1
Germ cell mutagenicity: Category 2
Carcinogenicity: Category 1B
Reproductive toxicity: Category 2
Specific target organ toxicity - single exposure: Category 1 (liver, respiratory system, kidneys)
Specific target organ toxicity - repeated exposure: Category 1 (respiratory system)
ENVIRONMENT HAZARDS
Hazardous to the aquatic environment, short-term (acute): Category 2
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
H330 Fatal if inhaled
H318 Causes serious eye damage
H341 Suspected of causing genetic defects
H350 May cause cancer
H361 Suspected of damaging fertility or the unborn child
H370 Causes damage to organs (liver, respiratory system, kidneys)
H372 Causes damage to organs through prolonged or repeated exposure (respiratory system)

H401 Toxic to aquatic life
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.
P284 In case of inadequate ventilation wear respiratory protection.
P271 Use only outdoors or in a well-ventilated area.
P264 Wash contaminated parts thoroughly after handling.
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.
P314 Get medical advice/attention if you feel unwell.
P308 + P313 IF exposed or concerned: Get medical advice/attention.
P310 Immediately call a POISON CENTER/doctor/physician.
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.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
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
Vanadium(V) oxide	99(min)	1314-62-1	1-559	V2O5

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

Section 4. First-aid measures

Descriptions of first-aid measures

General measures

Get medical advice/attention 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.

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.

Unsuitable extinguishing media

Unsuitable extinguishing media data is not available.

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.

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.
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
Japan control value 0.03mg-V/m3

Adopted value
JSOH(2003) 0.05mg/m3
ACGIH(2009) TWA: 0.05mg-V/m3(I) (URT & LRT irr)

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: Powder

Color: Red to yellow

Odor data is not available.

Melting point/Freezing point: 690℃

Boiling point or initial boiling point: (Vanadium(V) oxide)(Decomposes) 1750℃

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 data is not available.

Auto-ignition temperature data is not available.

Decomposition temperature data is not available.

pH data is not available.

Kinematic viscosity data is not available.

Solubility:

Solubility in water: 0.8 g/100 ml

Solubility in solvent data is not available.

n-Octanol/water partition coefficient data is not available.

Vapor pressure data is not available.

Density and/or relative density: 3.4

Relative vapor density (Air=1) data is not available.

Particle characteristics data is not available.

Other information

Other information is not available.

Section 10. Stability and Reactivity

Reactivity

Not available.

Chemical stability

Stable under normal storage/handling conditions.

Possibility of hazardous reactions

Decomposes on heating. This produces toxic fumes. Reacts with combustible substances. (ICSC 0596)

Conditions to avoid

Contact with incompatible materials.

Contact with fire source.

Incompatible materials

Combustible materials

Hazardous decomposition products

Vanadium compounds

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]

rat LD50=267.5mg/kg (technical grade pulverised) [313.8mg/kg (male), 221.1mg/kg (female)] (OECD TG 401, GLP) (ECHA RAC Opinion, 2020)

Acute toxicity (Dermal)

[Data for components of the product]

[GHS Cat. Japan, base data]

rat LD50 >2500mg/kg (OECD TG 402、GLP) (CLH Report, 2019)

Acute toxicity (Inhalation)

[Product]

Category 2, Fatal if inhaled

[Data for components of the product]

[GHS Cat. Japan, base data]

dust: rat LC50=0.25mg/L/4hr (Median particle size: 1.88-2.75 micro m) (GLP) (ECHA RAC Opinion, 2020)

Irritant properties

Skin corrosion/irritation data is not available.

Serious eye damage/irritation

[Product]

Category 1, Causes serious eye damage

[Data for components of the product]

[GHS Cat. Japan, base data]

rabbit (OECD TG 405, GLP) serious damage(AICIS IMAP, 2016)

Allergenic and sensitizing effects data is not available.

Germ cell mutagenicity

[Product]

Category 2, Suspected of causing genetic defects

[Data for components of the product]

[GHS Cat. Japan, base data]

cat. 2; CLH Report, 2019; ECHA RAC Opinion, 2020

Carcinogenicity

[Product]

Category 1B, May cause cancer

[Data for components of the product]

[GHS Cat. Japan, base data]

cat.1B; (CLH Report, 2019 et al.)

[IARC]

Group 2B : Possibly carcinogenic to humans

[ACGIH]

A3(as V)(2009) : Confirmed Animal Carcinogen with Unknown Relevance to Humans

[EU]

Category 1B; Substances presumed to have carcinogenic potential for humans

Reproductive toxicity

[Product]
Category 2, Suspected of damaging fertility or the unborn child
[Data for components of the product]
[GHS Cat. Japan, base data]
cat. 2; AICIS IMAP, 2016; CLH Report, 2019

Specific target organ toxicity (STOT)

STOT-single exposure
[Product]
Category 1, Causes damage to organs
[Data for components of the product]
[cat.1]
[GHS Cat. Japan, base data]
liver, respiratory system, kidneys (CICAD 20, 2001)

STOT-repeated exposure
[Product]
Category 1, Causes damage to organs through prolonged or repeated exposure
[Data for components of the product]
[cat.1]
[GHS Cat. Japan, base data]
respiratory system (CLH Report, 2019)

Aspiration hazard data is not available.

Information on other hazards
May cause lung disorders by massive inhalation of powdered substance.
-e.g. fibrosis of lung tissue, cough, sputum, breath shortness, dyspnea, decline of lung function, interstitial lung disease, pneumothorax

Section 12. Ecological Information

Toxicity

Aquatic toxicity
[Product]
Category 2, 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]
Fish (Atheriniformes) LC50=4.46mg/L/96hr (MOE Japan, 2013)
Hazardous to the aquatic environment, long-term (chronic)
[GHS Cat. Japan, base data]
Fish (Cyprinodontiformes) F1 generation NOEC=0.073mg/L (MOE Japan, 2013)

Water solubility
0.8 g/100 ml (ICSC, 1999)

Persistence and degradability
Persistence and degradability data is not available.

Bioaccumulative potential
[Data for components of the product]
BCF=14 (Check & Review, Japan)

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 : 2862

UN Proper Shipping Name :

VANADIUM PENTOXIDE, non-fused form

Class or division (Transport hazard class) : 6.1

Packing group : III

ERG GUIDE No.: 151

IMDG Code (International Maritime Dangerous Goods Regulations)

UN Number or ID Number : 2862

UN Proper Shipping Name :

VANADIUM PENTOXIDE, non-fused form

Class or division (Transport hazard class) : 6.1

Packing group : III

IATA (Dangerous Goods Regulations)

UN Number or ID Number : 2862

UN Proper Shipping Name :

VANADIUM PENTOXIDE, non-fused form

Class or division (Transport hazard class) : 6.1

Hazard labels : Toxic

Packing group : III

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

Applicable

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

Please provide SDS to customers for selling or transferring.
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).