



Safety Data Sheet

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

Product identifier:

Product name: Vanadium(V) oxide, powder

SDS No. : Q8416E-3

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

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2. Hazards identification

GHS classification and label elements of the product**Classification of the substance or mixture****HEALTH HAZARDS**

Acute toxicity (Oral): Category 2

Acute toxicity (Inhalation): Category 4

Serious eye damage/eye irritation: Category 2A

Germ cell mutagenicity: Category 1B

Carcinogenicity: Category 2

Specific target organ toxicity – single exposure: Category 1 (respiratory system; liver; kidney)

Specific target organ toxicity – repeated exposure: Category 1 (respiratory system)

Specific target organ toxicity – repeated exposure: Category 2 (liver)

ENVIRONMENT HAZARDS

Hazardous to the aquatic environment (Acute): Category 2

Hazardous to the aquatic environment (Long-term): Category 1

Label elements

Signal word: Danger

HAZARD STATEMENT

Fatal if swallowed

Harmful if inhaled

Causes serious eye irritation

May cause genetic defects

Suspected of causing cancer

Causes damage to organs (respiratory system; liver; kidney)

Causes damage to organs through prolonged or repeated exposure (respiratory system)

May cause damage to organs through prolonged or repeated exposure (liver)

Toxic to aquatic life

Very toxic to aquatic life with long lasting effects

PRECAUTIONARY STATEMENT**Prevention**

Avoid release to the environment.



Do not breathe dust/fume/gas/mist/vapors/spray.
Use only outdoors or in a well-ventilated area.
Wash contaminated parts thoroughly after handling.
Wear eye protection/face protection.
Do not eat, drink or smoke when using this product.

Response

Collect spillage.
Get medical advice/attention if you feel unwell.
IF exposed or concerned: Get medical advice/attention.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
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: Immediately call a POISON CENTER/doctor/physician.
IF SWALLOWED: Rinse mouth.

Disposal

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

3. Composition/information on ingredients**Mixture/Substance selection:****Substance**

Ingredient name: Vanadium(V) oxide

Content (%): 99(min)

Chemical formula: V₂O₅

Chemicals No, Japan: 1-559

CAS No.: 1314-62-1

MW: 181.88

ECNO: 215-239-8

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

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 (or hair)

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.



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

Containers may explode when heated.

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

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 full face piece operated positive pressure mode.

6. Accidental release measures

Personnel precautions, protective equipment and emergency procedures

Ventilate area until material pick up is complete.

Wear proper protective equipment.

Environmental precautions

Prevent spills from entering sewers, watercourses or low areas.

Avoid raising dust.

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.

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

Use only outdoors or in a well-ventilated area.

Wear protective gloves, protective clothing or face protection.

Wear eye protection/face protection.

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

Keep under lock and key.

Container and packaging materials for safe handling

Glass

Polyethylene

8. Exposure controls/personal protection

Control parameters

Adopted value

(Vanadium(V) oxide)

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

OSHA-PEL

(Vanadium(V) oxide)

STEL: C 0.5mg-V₂O₅/m³ (Respirable dust)

STEL: C 0.1mg/m³ (Fume (as V₂O₅))

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

Respiratory protection

Wear respiratory protection.

Hand protection

Wear protective gloves.

Eye protection

Wear eye/face protection.

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 data is not available.

Boiling point or initial boiling point data is not available.

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

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.

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 substances

Hazardous decomposition products

Vanadium compounds

11. Toxicological Information

Information on toxicological effects

Acute toxicity

Acute toxicity (Oral)

[GHS Cat. Japan, base data]

(Vanadium(V) oxide)

rat LD50=10mg/kg (CERI hazard data 2000-49, 2001)

Acute toxicity (Inhalation)

[GHS Cat. Japan, base data]

(Vanadium(V) oxide)

mist: rat LC50=4.29mg/L/4hr (IUCLID, 2000)

Irritant properties

Skin corrosion/irritation data is not available.

Serious eye damage/irritation

[GHS Cat. Japan, base data]

(Vanadium(V) oxide)

rabbit moderate (RTECS, 2004)

Allergenic and sensitizing effects data is not available.

Germ cell mutagenicity

[GHS Cat. Japan, base data]

(Vanadium(V) oxide)

cat. 1B; CICAD 29, 2001

Carcinogenicity

[GHS Cat. Japan, base data]

(Vanadium(V) oxide)

cat.2; IARC Gr. 2B (IARC, 2005, in preparation)

[IARC]

(Vanadium(V) oxide)

Group 2B : Possibly carcinogenic to humans

[ACGIH]

(Vanadium(V) oxide)

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



Reproductive toxicity data is not available.

STOT

STOT-single exposure

[cat.1]

[GHS Cat. Japan, base data]

(Vanadium(V) oxide)

respiratory system; liver; kidney (Sjoberg et al, 1950; Duthon, 1911; CICAD)

STOT-repeated exposure

[cat.1]

[GHS Cat. Japan, base data]

(Vanadium(V) oxide)

respiratory system (Roshchin, 1952)

[cat.2]

[GHS Cat. Japan, base data]

(Vanadium(V) oxide)

liver (Handbook of the Toxicology of Metals. 2nd ed., 1986)

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

12. Ecological Information

Ecotoxicity

Aquatic toxicity

Toxic to aquatic life

Very toxic to aquatic life with long lasting effects

Hazardous to the aquatic environment (Acute)

[GHS Cat. Japan, base data]

(Vanadium(V) oxide)

Fish (Atheriniformes) LC50=4.46mg/L/96hr (MOE Japan, 2013)

Hazardous to the aquatic environment (Long-term)

[GHS Cat. Japan, base data]

(Vanadium(V) oxide)

Fish (Cypripodontiformes) F1 generation NOEC=0.073mg/L (MOE Japan, 2013)

Water solubility

(Vanadium(V) oxide)

0.8 g/100 ml (ICSC, 1999)

Persistence and degradability

Persistence and degradability data is not available.

Bioaccumulative potential

(Vanadium(V) oxide)

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.



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 in accordance with local/national regulation.

14. Transport Information

UN No. or ID No.: 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 No.: 2862

Proper Shipping Name :

VANADIUM PENTOXIDE, non-fused form

Class or division : 6.1

Packing group : III

IATA Dangerous Goods Regulations

UN No.: 2862

Proper Shipping Name :

VANADIUM PENTOXIDE, non-fused form

Class or division : 6.1

Hazard labels : Toxic

Packing group : III

Environmental hazards

MARPOL Annex III – Prevention of pollution by harmful substances

Marine pollutants (yes/no) : yes

MARPOL Annex V – Prevention of pollution by garbage discharge

Germ cell mutagenicity: cat.1, 1A, 1B

Vanadium(V) oxide

Specific target organ toxicity – repeated exposure: cat.1

Vanadium(V) oxide

Hazardous to the aquatic environment – long-term hazard: cat.1, 2

Vanadium(V) oxide

15. Regulatory Information

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

Chemicals listed in TSCA Inventory

Vanadium(V) oxide

Other regulatory information

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



16. Other information**GHS classification and labelling**

Acute Tox. 2: H300 Fatal if swallowed

Acute Tox. 4: H332 Harmful if inhaled

Eye Irrit. 2A: H319 Causes serious eye irritation

Muta. 1B: H340 May cause genetic defects

Carc. 2: H351 Suspected of causing cancer

STOT SE 1: H370 Causes damage to organs

STOT RE 1: H372 Causes damage to organs through prolonged or repeated exposure

STOT RE 2: H373 May cause damage to organs through prolonged or repeated exposure

Aquatic Acute 2: H401 Toxic to aquatic life

Aquatic Chronic 1: H410 Very toxic to aquatic life with long lasting effects

Reference Book

Globally Harmonized System of classification and labelling of chemicals, UN

Recommendations on the TRANSPORT OF DANGEROUS GOODS 21th edit., 2019 UN

IMDG Code, 2018 Edition (Incorporating Amendment 39-18)

IATA Dangerous Goods Regulations (62nd Edition) 2021

2020 EMERGENCY RESPONSE GUIDEBOOK (US DOT)

2021 TLVs and BEIs. (ACGIH)

Supplier's data/information

General Disclaimer

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 2020).