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SIGMA-ALDRICH

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Material Safety Data Sheet

Version 4.0
Revision Date 03/13/2010
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1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Vanadium(V) oxide

Product Number : 223794
Brand : Aldrich

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +18003255832
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2. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards

Carcinogen, Target Organ Effect, Highly toxic by inhalation, Highly toxic by ingestion, Highly toxic by skin absorption, Irritant, Teratogen

Target Organs

Lungs

GHS Label elements, including precautionary statements

Pictogram



Signal word : Danger

Hazard statement(s)

H300 + H310 : Fatal if swallowed or in contact with skin.
 H319 : Causes serious eye irritation.
 H330 : Fatal if inhaled.
 H341 : Suspected of causing genetic defects.
 H361 : Suspected of damaging fertility or the unborn child.
 H371 : May cause damage to organs.
 H400 : Very toxic to aquatic life.
 H411 : Toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P260 : Do not breathe dust/fume/gas/mist/vapours/spray.
 P264 : Wash hands thoroughly after handling.
 P273 : Avoid release to the environment.
 P280 : Wear protective gloves/protective clothing.
 P284 : Wear respiratory protection.
 P302 + P350 : IF ON SKIN: Gently wash with plenty of soap and water.
 P305 + P351 + P338 : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P310 : Immediately call a POISON CENTER or doctor/physician.

HMIS Classification

Health hazard: 3
Chronic Health Hazard: *

Flammability: 0
 Physical hazards: 0

NFPA Rating
 Health hazard: 3
 Fire: 0
 Reactivity Hazard: 0

Potential Health Effects

Inhalation : May be fatal if inhaled. Causes respiratory tract irritation.
Skin : Causes skin irritation. May be fatal if absorbed through skin.
Eyes : Causes eye irritation.
Ingestion : May be fatal if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Formula : O₅V₂
 Molecular Weight : 181.88 g/mol

CAS-No.	EC-No.	Index-No.	Concentration
Vanadium pentoxide			
1314-62-1	215-239-8	023-001-00-8	-

4. FIRST AID MEASURES

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Special protective equipment for fire-fighters

Wear self contained breathing apparatus for fire fighting if necessary.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

Use personal protective equipment. Avoid dust formation. Avoid breathing dust. Ensure adequate ventilation. Evacuate personnel to safe areas.

Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling

Avoid formation of dust and aerosols.

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Provide appropriate exhaust ventilation at places where dust is formed. Normal measures for preventive fire protection.

Conditions for safe storage

Keep container tightly closed in a dry and well-ventilated place.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value	Control parameters	Update	Basis
Vanadium pentoxide	1314-62-1	TWA	0.05 mg/m3	2007-01-01	USA, ACGIH Threshold Limit Values (TLV)
Remarks	Irritation Lung Adopted values or notations enclosed are those for which changes are proposed in the NIC See Notice of Intended Changes (NIC) Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen: Agents which cause concern that they could be carcinogenic for humans but which cannot be assessed conclusively because of a lack of data. In vitro or animal studies do not provide indications of carcinogenicity which are sufficient to classify the agent into one of the other categories.				
		TWA	0.05 mg/m3	1989-01-19	USA, OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		TWA	0.05 mg/m3	2008-01-01	USA, ACGIH Threshold Limit Values (TLV)
	Irritation Lung Adopted values or notations enclosed are those for which changes are proposed in the NIC See Notice of Intended Changes (NIC) Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen: Agents which cause concern that they could be carcinogenic for humans but which cannot be assessed conclusively because of a lack of data. In vitro or animal studies do not provide indications of carcinogenicity which are sufficient to classify the agent into one of the other categories.				
		C	0.1 mg/m3	2007-01-01	USA, Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
Ceiling limit is to be determined from breathing-zone air samples.					
		C	0.5 mg/m3	2007-01-01	USA, Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
Ceiling limit is to be determined from breathing-zone air samples.					
		TWA	0.05 mg/m3	1989-01-19	USA, OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000

Personal protective equipment

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection

Handle with gloves.

Eye protection

Face shield and safety glasses

Skin and body protection

Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Hygiene measures

Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form solid

Safety data

pH no data available
 Melting point 690 °C (1,274 °F) - lit.
 Boiling point no data available
 Flash point not applicable
 Ignition temperature no data available
 Lower explosion limit no data available
 Upper explosion limit no data available
 Density 3.35 g/mL at 25 °C (77 °F)
 Water solubility no data available

10. STABILITY AND REACTIVITY

Chemical stability

Stable under recommended storage conditions.

Conditions to avoid

no data available

Materials to avoid

Strong acids

Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Vanadium/vanadium oxides

11. TOXICOLOGICAL INFORMATION

Acute toxicity

LD50 Oral - rat - 10 mg/kg
 Remarks: Behavioral:Coma.

LC50 Inhalation - rat - 6 h - 126 mg/m3

Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Other. Behavioral:Ataxia. Lungs. Thorax, or Respiration:Dyspnea.

LD50 Dermal - rabbit - 50 mg/kg

Remarks: Liver:Other changes. Kidney, Ureter, Bladder:Other changes.

Skin corrosion/irritation

Serious eye damage/eye irritation

Eyes - rabbit - Moderate eye irritation - 24 h

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

Laboratory experiments have shown mutagenic effects.
 In vitro tests showed mutagenic effects

Carcinogenicity

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Vanadium pentoxide)

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or

anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

Possible risk of congenital malformation in the fetus.
Suspected human reproductive toxicant

Specific target organ toxicity - single exposure (GHS)

May cause damage to organs.

Specific target organ toxicity - repeated exposure (GHS)

no data available

Aspiration hazard

no data available

Potential health effects

Inhalation	May be fatal if inhaled. Causes respiratory tract irritation.
Ingestion	May be fatal if swallowed.
Skin	Causes skin irritation. May be fatal if absorbed through skin.
Eyes	Causes eye irritation.

Signs and Symptoms of Exposure

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Additional Information

12. ECOLOGICAL INFORMATION

Toxicity

Toxicity to fish	LC50 - Oncorhynchus mykiss (rainbow trout) - 5.2 mg/l - 96.0 h
Toxicity to daphnia and other aquatic invertebrates.	EC50 - Daphnia magna (Water flea) - 0.94 mg/l - 48 h

Persistence and degradability

no data available

Bioaccumulative potential

no data available

Mobility in soil

no data available

PBT and vPvB assessment

no data available

Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

13. DISPOSAL CONSIDERATIONS

Product

Observe all federal, state, and local environmental regulations. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN-Number: 2862 Class: 6.1 Packing group: III
Proper shipping name: Vanadium pentoxide
Reportable Quantity (RQ): 1000 lbs
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG

UN-Number: 2862 Class: 6.1 Packing group: III EMS-No: F-A, S-A
Proper shipping name: VANADIUM PENTOXIDE
Marine pollutant: No

IATA

UN-Number: 2862 Class: 6.1 Packing group: III
Proper shipping name: Vanadium pentoxide

15. REGULATORY INFORMATION

OSHA Hazards

Carcinogen, Target Organ Effect, Highly toxic by inhalation, Highly toxic by ingestion, Highly toxic by skin absorption, Irritant, Teratogen

DSL Status

All components of this product are on the Canadian DSL list.

SARA 302 Components

	CAS-No.	Revision Date
Vanadium pentoxide	1314-62-1	2007-07-01

SARA 313 Components

	CAS-No.	Revision Date
Vanadium pentoxide	1314-62-1	2007-07-01

SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Vanadium pentoxide	1314-62-1	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Vanadium pentoxide	1314-62-1	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Vanadium pentoxide	1314-62-1	2007-07-01

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Further information

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