

Material Safety Data Sheet

According to OSHA and ANSI

Printing date 08/25/2011

Reviewed on 08/23/2011

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

Product identifier

Product name: Vanadium (IV) fluoride

Stock number: 11543

CAS Number:

10049-16-8

EC number:

233-171-7

Relevant identified uses of the substance or mixture and uses advised against.

Sector of Use SU24 Scientific research and development

Details of the supplier of the safety data sheet

Manufacturer/Supplier:

Alfa Aesar, A Johnson Matthey Company
Johnson Matthey Catalog Company, Inc.

30 Bond Street

Ward Hill, MA 01835-8099

Tel: 800-343-0660

Fax: 800-322-4757

Email: tech@alfa.com

www.alfa.com

Information Department: Health, Safety and Environmental Department

Emergency telephone number:

During normal hours the Health, Safety and Environmental Department at (800) 343-0660. After normal hours call Carechem 24 at (866) 928-0789.

2 Hazards identification

Classification of the substance or mixture



GHS06 Skull and crossbones

H300 Fatal if swallowed.

H330 Fatal if inhaled.



GHS05 Corrosion

H314 Causes severe skin burns and eye damage.

H318 Causes serious eye damage.

Classification according to Directive 67/548/EEC or Directive 1999/45/EC



T; Toxic

R23/25: Toxic by inhalation and if swallowed.



C; Corrosive

R34: Causes burns.

Information concerning particular hazards for human and environment: Not applicable

Label elements

Labelling according to EU guidelines:

Code letter and hazard designation of product:

T Toxic

C Corrosive

Risk phrases:

23/25 Toxic by inhalation and if swallowed.

34 Causes burns.

Safety phrases:

26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

45 In case of accident or if you feel unwell, seek medical advice immediately.

60 This material and its container must be disposed of as hazardous waste.

Hazard description:

WHMIS classification

D1A - Very toxic material causing immediate and serious toxic effects

D2B - Toxic material causing other toxic effects

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E - Corrosive material



Classification system

HMIS ratings (scale 0-4)

(Hazardous Materials Identification System)

| | |
|------------|--------------------------------|
| HEALTH | <input type="text" value="3"/> |
| FIRE | <input type="text" value="0"/> |
| REACTIVITY | <input type="text" value="2"/> |

Health (acute effects) = 3

Flammability = 0

Reactivity = 2

Other hazards

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

3 Composition/information on ingredients

Chemical characterization: Substances

CAS# Description:

10049-16-8 Vanadium (IV) fluoride

Identification number(s):

EC number: 233-171-7

4 First aid measures

Description of first aid measures

General information

Immediately remove any clothing soiled by the product.

Remove breathing apparatus only after contaminated clothing has been completely removed.

In case of irregular breathing or respiratory arrest provide artificial respiration.

After inhalation

Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.

After skin contact

Immediately wash with water and soap and rinse thoroughly.

Seek immediate medical advice.

After eye contact

Rinse opened eye for several minutes under running water. Then consult a doctor.

After swallowing

Do not induce vomiting; immediately call for medical help.

Seek immediate medical advice.

Information for doctor

Most important symptoms and effects, both acute and delayed

No further relevant information available.

Indication of any immediate medical attention and special treatment needed

No further relevant information available.

5 Firefighting measures

Extinguishing media

Suitable extinguishing agents

Product is not flammable. Use fire fighting measures that suit the surrounding fire.

Special hazards arising from the substance or mixture

In case of fire, the following can be released:

Metal oxide fume

Hydrogen fluoride (HF)

Advice for firefighters

Protective equipment:

Wear self-contained respirator.

Wear fully protective impervious suit.

6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

Wear protective equipment. Keep unprotected persons away.

Ensure adequate ventilation

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Environmental precautions:

Do not allow material to be released to the environment without proper governmental permits.

Methods and material for containment and cleaning up:

Use neutralizing agent.

Dispose contaminated material as waste according to item 13.

Ensure adequate ventilation.

Reference to other sections

See Section 7 for information on safe handling

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

7 Handling and storage**Handling****Precautions for safe handling**

Handle under dry protective gas.

Keep container tightly sealed.

Store in cool, dry place in tightly closed containers.

Ensure good ventilation at the workplace.

Open and handle container with care.

Information about protection against explosions and fires: The product is not flammable**Conditions for safe storage, including any incompatibilities****Storage****Requirements to be met by storerooms and receptacles:** No special requirements.**Information about storage in one common storage facility:**

Store away from water/moisture.

Store away from oxidizing agents.

Further information about storage conditions:

Store under dry inert gas.

This product is moisture sensitive.

Keep container tightly sealed.

Store in cool, dry conditions in well sealed containers.

Protect from humidity and water.

Specific end use(s) No further relevant information available.**8 Exposure controls/personal protection****Additional information about design of technical systems:**

Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Control parameters**Components with limit values that require monitoring at the workplace:** Not required.**Additional information:** No data**Exposure controls****Personal protective equipment****General protective and hygienic measures**

The usual precautionary measures for handling chemicals should be followed.

Keep away from foodstuffs, beverages and feed.

Remove all soiled and contaminated clothing immediately.

Wash hands before breaks and at the end of work.

Store protective clothing separately.

Avoid contact with the eyes and skin.

Breathing equipment: Use suitable respirator when high concentrations are present.**Protection of hands:**

Check protective gloves prior to each use for their proper condition.

Impervious gloves**Material of gloves** The selection of suitable gloves not only depends on the material, but also on quality.

Quality will vary from manufacturer to manufacturer.

Eye protection:**Safety glasses****Tightly sealed goggles****Full face protection****Body protection:** Protective work clothing.

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9 Physical and chemical properties

Information on basic physical and chemical properties

General Information

Appearance:

| | |
|------------------|-----------------|
| Form: | Crystalline |
| Color: | Green to brown |
| Odor: | Not determined |
| Odour threshold: | Not determined. |

| | |
|-----------|-----------------|
| pH-value: | Not applicable. |
|-----------|-----------------|

Change in condition

| | |
|----------------------------------|----------------------|
| Melting point/Melting range: | 325°C (617 °F) (dec) |
| Boiling point/Boiling range: | Not determined |
| Sublimation temperature / start: | Not determined |

| | |
|-------------------------------|-----------------|
| Flammability (solid, gaseous) | Not determined. |
|-------------------------------|-----------------|

| | |
|-----------------------|----------------|
| Ignition temperature: | Not determined |
|-----------------------|----------------|

| | |
|----------------------------|----------------|
| Decomposition temperature: | Not determined |
|----------------------------|----------------|

| | |
|----------------|-----------------|
| Auto igniting: | Not determined. |
|----------------|-----------------|

| | |
|-------------------|--|
| Explosion limits: | |
|-------------------|--|

| | |
|--------|----------------|
| Lower: | Not determined |
| Upper: | Not determined |

| | |
|-----------------|-----------------|
| Vapor pressure: | Not applicable. |
|-----------------|-----------------|

| | |
|--------------------------|-----------------------------|
| Density at 20°C (68 °F): | 3.15 g/cm³ (26.287 lbs/gal) |
|--------------------------|-----------------------------|

| | |
|------------------|-----------------|
| Relative density | Not determined. |
|------------------|-----------------|

| | |
|----------------|-----------------|
| Vapour density | Not applicable. |
|----------------|-----------------|

| | |
|------------------|-----------------|
| Evaporation rate | Not applicable. |
|------------------|-----------------|

| | |
|---|---------|
| Solubility in / Miscibility with Water: | Soluble |
|---|---------|

| | |
|--|-----------------|
| Segregation coefficient (n-octanol/water): | Not determined. |
|--|-----------------|

| | |
|------------|--|
| Viscosity: | |
|------------|--|

| | |
|----------|-----------------|
| dynamic: | Not applicable. |
|----------|-----------------|

| | |
|------------|-----------------|
| kinematic: | Not applicable. |
|------------|-----------------|

| | |
|-------------------|--|
| Other information | No further relevant information available. |
|-------------------|--|

10 Stability and reactivity

Reactivity

Chemical stability

Thermal decomposition / conditions to be avoided:

Decomposition will not occur if used and stored according to specifications.

Possibility of hazardous reactions No dangerous reactions known

Incompatible materials:

Water/moisture

Oxidizing agents

Hazardous decomposition products:

Metal oxide fume

Hydrogen fluoride

11 Toxicological information

Information on toxicological effects

Acute toxicity:

Primary irritant effect:

on the skin: Corrosive effect on skin and mucous membranes.

on the eye: Strong corrosive effect.

Sensitization: No sensitizing effects known.

Subacute to chronic toxicity:

Other than potential irritation (see above), no information on illness or injury to humans from acute or chronic exposure to this product is available.

Additional toxicological information:

To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

Swallowing will lead to a strong corrosive effect on mouth and throat and to the danger of perforation of esophagus and stomach.

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No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

12 Ecological information

Toxicity

Acquatic toxicity: No further relevant information available.

Persistence and degradability: No further relevant information available.

Behavior in environmental systems:

Bioaccumulative potential: No further relevant information available.

Mobility in soil: No further relevant information available.

Additional ecological information:

General notes:

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

Do not allow material to be released to the environment without proper governmental permits.

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

Other adverse effects: No further relevant information available.

13 Disposal considerations

Waste treatment methods

Recommendation: Consult state, local or national regulations to ensure proper disposal.

Uncleaned packagings:

Recommendation: Disposal must be made according to official regulations.

Recommended cleansing agent: Water, if necessary with cleansing agents.

14 Transport information

UN-Number

DOT, ADR, IMDG, IATA

UN2923

UN proper shipping name

DOT, IMDG, IATA

CORROSIVE SOLID, TOXIC, N.O.S. (Vanadium (IV) fluoride)

ADR

2923 CORROSIVE SOLID, TOXIC, N.O.S. (Vanadium (IV) fluoride)

Transport hazard class(es)

DOT, IMDG, IATA



Class Label

8 Corrosive substances.
8+6.1

ADR



Class Label

8 (CT2) Corrosive substances
8+6.1

Packing group

DOT, ADR, IMDG, IATA

II

Environmental hazards:

Marine pollutant:

No

Special precautions for user

Warning: Corrosive substances

Danger code (Kemler):

86

Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable.

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| | |
|------------------------|--|
| UN "Model Regulation": | UN2923, CORROSIVE SOLID, TOXIC, N.O.S. (Vanadium (IV) fluoride), 8 (6.1), II |
|------------------------|--|

15 Regulatory information

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

Product related hazard informations:

Hazard symbols:

T Toxic

C Corrosive

Risk phrases:

23/25 Toxic by inhalation and if swallowed.

34 Causes burns.

Safety phrases:

26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

45 In case of accident or if you feel unwell, seek medical advice immediately.

60 This material and its container must be disposed of as hazardous waste.

National regulations

This product is not listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical Substance Inventory. Use of this product is restricted to research and development only.

Some or all of the components of this product are not listed on the Canadian Domestic Substances List (DSL) or the Canadian Non-Domestic Substances List (NDSL).

Information about limitation of use: For use only by technically qualified individuals.

Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing MSDS: Health, Safety and Environmental Department.

Contact:

Zachariah C. Holt

Global EHS Manager

Abbreviations and acronyms:

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

ICAO: International Civil Aviation Organization

EINECS: European Inventory of Existing Commercial Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

HMIS: Hazardous Materials Identification System (USA)

WHMIS: Workplace Hazardous Materials Information System (Canada)

USA