

SAFETY DATA SHEET

Preparation Date: No data available

Revision Date: 03/23/2015

Revision Number: G1

Product identifier

Product code: V1010
Product Name: VANADIUM PENTOXIDE, POWDER, REAGENT

Other means of identification

Synonyms: Anhydride vanadique (French)
C.I. 77938
Divanadium pentaoxide
Divanadium pentoxide
RCRA waste number P120
Pentaoxodivanadium
Vanadic anhydride
Vanadic acid anhydride
Vanadium (OSHA)
Vanadium oxide (V205)
Vanadium (V) oxide
Vanadio, pentossido di (Italian)
Vanadium pentaoxide
Vanadium pentoxide
Vanadium pentoxide (ACGIH)
Vanadium, pentoxyde de (French)
Vanadiumpentoxid (German)
Vanadiumpentoxyde (Dutch)
Wanadu pieciotlenek (Polish)

CAS #: 1314-62-1
RTECS # YW2450000
CI#: Not available

Recommended use of the chemical and restrictions on use

Recommended use: Manufacture of yellow glass. oxidation catalyst for sulfuric acid manufacture.
Uses advised against No information available

Supplier: Spectrum Chemical Mfg. Corp
14422 South San Pedro St.
Gardena, CA 90248
(310) 516-8000

Order Online At: <https://www.spectrumchemical.com>

Emergency telephone number Chemtrec 1-800-424-9300
Contact Person: Martin LaBenz (West Coast)
Contact Person: Ibad Tirmiz (East Coast)

2. HAZARDS IDENTIFICATION

2. HAZARDS IDENTIFICATION

Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

| | |
|--|------------|
| Acute toxicity - Oral | Category 2 |
| Acute toxicity - Dermal | Category 1 |
| Acute toxicity - Inhalation (Gases) | Category 4 |
| Acute toxicity - Inhalation (Dusts/Mists) | Category 4 |
| Skin corrosion/irritation | Category 2 |
| Serious eye damage/eye irritation | Category 2 |
| Germ cell mutagenicity | Category 2 |
| Carcinogenicity | Category 2 |
| Reproductive toxicity | Category 2 |
| Specific target organ toxicity (single exposure) | Category 3 |
| Specific target organ toxicity (repeated exposure) | Category 1 |

Label elements

Danger

Hazard statements

Fatal if swallowed
Fatal in contact with skin
Harmful if inhaled
Causes skin irritation
Causes serious eye irritation
Suspected of causing genetic defects
Suspected of causing cancer
Suspected of damaging fertility or the unborn child
May cause respiratory irritation. May cause drowsiness or dizziness
Causes damage to organs through prolonged or repeated exposure



Hazards not otherwise classified (HNOC)

Not Applicable

Other hazards

Toxic to aquatic life with long lasting effects

Precautionary Statements - Prevention

Obtain special instructions before use
 Do not handle until all safety precautions have been read and understood
 Use personal protective equipment as required
 Wash face, hands and any exposed skin thoroughly after handling
 Do not eat, drink or smoke when using this product
 Do not get in eyes, on skin, or on clothing
 Use only outdoors or in a well-ventilated area
 Do not breathe dust/fume/gas/mist/vapors/spray
 Wear protective gloves/protective clothing/eye protection/face protection

Precautionary Statements - Response

IF exposed or concerned: Get medical advice/attention
 Specific treatment (see .? on this label)
 Specific measures (see .? on this label)
 Specific treatment (see .? on this label)
 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.
 Immediately call a POISON CENTER or doctor/physician
 IF ON SKIN: Gently wash with plenty of soap and water
 Remove/Take off immediately all contaminated clothing
 Wash contaminated clothing before reuse
 If skin irritation occurs: Get medical advice/attention
 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
 Rinse mouth

Precautionary Statements - Storage

Store locked up
 Store in a well-ventilated place. Keep container tightly closed

Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

| |
|--|
| 3. COMPOSITION/INFORMATION ON INGREDIENTS |
|--|

| Components | CAS-No. | Weight % | Trade Secret |
|---------------------------------|-----------|----------|--------------|
| Vanadium Pentoxide 1314-62-1 | 1314-62-1 | 100 | * |

| |
|------------------------------|
| 4. FIRST AID MEASURES |
|------------------------------|

First aid measures**General Advice:**

Poison information centers in each State capital city can provide additional assistance for scheduled poisons (13 1126)

Skin Contact:

Wash off immediately with soap and plenty of water. Continue flushing with plenty of water for at least 15 minutes. Remove all contaminated clothes and shoes. Immediate medical attention is required. Call a physician or Poison Control Centre immediately.

Eye Contact:

Flush eye with water for 15 minutes. Immediate medical attention is required. Call a physician immediately.

Inhalation:

Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention. **WARNING!** It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled or ingested material is toxic, infectious or corrosive.

Ingestion: Toxic if swallowed. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Immediate medical attention is required. Call a physician or Poison Control Center immediately.

Most important symptoms and effects, both acute and delayed

Symptoms Causes skin irritation. Causes serious eye irritation. Harmful by inhalation. Harmful if swallowed. May cause irritation of respiratory tract. Chest tightness. Coughing and wheezing. Abdominal discomfort, nausea, vomiting, cramping.

Indication of any immediate medical attention and special treatment needed

Notes to Physician: Treat symptomatically

Protection of first-aiders

First-Aid Providers: Avoid exposure to blood or body fluids. Wear gloves and other necessary protective clothing. Dispose of contaminated clothing and equipment as bio-hazardous waste

5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media: The product is not flammable. If it is involved in a fire, extinguish the fire using an agent suitable for the type of surrounding fire.

Unsuitable Extinguishing Media: No information available.

Specific hazards arising from the chemical

Hazardous Combustion Products: Vanadium oxides

Specific hazards: When heated to decomposition it emits toxic fumes

Special Protective Actions for Firefighters

Specific Methods: Move containers from fire area if you can do it without risk. Water mist may be used to cool closed containers.

Special Protective Equipment for Firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions: Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Ensure adequate ventilation. Avoid dust formation. Keep people away from and upwind of spill/leak. All equipment used when handling the product must be grounded.

Environmental precautions Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Prevent entry into waterways, sewers, basements or confined areas.

Methods and material for containment and cleaning up

Methods for containment Absorb spill with inert material (e.g. vermiculite, dry sand or earth), then place in a suitable chemical waste container. Stop leak if you can do it without risk.

Methods for cleaning up Use appropriate tools to put the spilled material in a suitable chemical waste disposal container. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Precautions for safe handling

Technical Measures/Precautions:

Provide sufficient air exchange and/or exhaust in work rooms. All equipment used when handling the product must be grounded. Avoid dust formation. Keep away from incompatible materials. Remove all sources of ignition.

Safe Handling Advice:

Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Avoid dust formation. Do not ingest. Do not breathe vapours/dust. Keep away from heat and sources of ignition. Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities

Technical Measures/Storage Conditions:

Keep containers tightly closed in a dry, cool and well-ventilated place. Store at room temperature in the original container. Store away from incompatible materials. Store in a segregated and approved area.

Incompatible Materials:

Strong acids. Strong bases. Strong oxidizing agents. Halogens. Lithium. Chlorine trifluoride. peroxy formic acid.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

National occupational exposure limits

United States

| Components | OSHA | NIOSH | ACGIH | AIHA WHEEL |
|--------------------------------|------|---------------------------------------|-------|------------|
| Vanadium Pentoxide - 1314-62-1 | None | 0.05 mg/m ³ Ceiling 15 min | None | None |

Canada

| Components | Alberta | British Columbia | Ontario | Quebec |
|--------------------------------|--|---|--|--|
| Vanadium Pentoxide - 1314-62-1 | 0.05 mg/m ³ TWA V2O5 fume or respirable particulate | 0.2 mg/m ³ TWA V2O5 total dust 0.05 mg/m ³ Ceiling V2O5 respirable dust and fume | 0.05 mg/m ³ TWA V inhalable | 0.05 mg/m ³ TWAEV V2O5 fume and respirable dust |

Australia and Mexico

| Components | Australia | Mexico |
|---------------------------------|----------------------------|---------------------------|
| Vanadium Pentoxide 1314-62-1 | 0.05 mg/m ³ TWA | 0.5 mg/m ³ TWA |

Appropriate engineering controls

Engineering measures to reduce exposure:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors and mist below their respective threshold limit value. Provide for appropriate exhaust ventilation and dust collection at machinery.

Individual protection measures, such as personal protective equipment

Personal Protective Equipment

Eye protection: Safety glasses with side-shields.

Skin and body protection: Long sleeved clothing.

Respiratory protection: Effective dust mask. Be sure to use an approved/certified respirator or equivalent..

Hygiene measures:

Avoid contact with skin, eyes and clothing. Do not breathe dust. When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|--|---|---|
| Physical state: Solid. | Appearance: Powder. | Color: Yellow-orange. Yellowish-Red. |
| Odor: Odorless. | Taste No information available | Molecular/Formula weight: 181.90 g/mol |
| Formula: V2O5 | Flash point (°C): No data available | Flashpoint (°C/°F): No information available. |
| Flash Point Tested according to: Not available | Lower Explosion Limit (%): No information available | Upper Explosion Limit (%): No information available |
| Autoignition Temperature (°C/°F): No information available | pH: No information available | Melting point/range(°C/°F): 690°C/ 1274°F |
| Boiling point/range(°C/°F): 1750°C/ 3182°F | Decomposition temperature(°C/°F): No information available | Bulk density: 1.2-1.3 g/cm3 |
| Specific gravity: 3.357 | Vapor pressure @ 20°C (kPa): No information available | Density (g/cm3): No information available |
| Evaporation rate: No information available | Vapor density: No information available | VOC content (g/L): No information available |
| Odor threshold (ppm): No information available | Partition coefficient (n-octanol/water): 2.97 | Viscosity: No information available |
| Miscibility: No information available | Solubility: Soluble in Acetone Partially soluble in cold water Soluble in acids Soluble in Alkalies Insoluble in alcohol Solubility in water: 1g/ 125 ml | |

10. STABILITY AND REACTIVITY

Reactivity

Reactive with strong oxidizing agents, strong bases, strong acids, halogens, chlorine trifluoride and lithium

Chemical stability**Stability:**

Stable under recommended storage conditions

Possibility of Hazardous Reactions:

Mixtures with calcium, sodium, and water may ignite spontaneously. When heated to decomposition it emits acrid smoke and irritating fumes

Conditions to avoid:

Incompatible materials. Avoid dust formation.

Incompatible Materials:

Strong acids. Strong bases. Strong oxidizing agents. Halogens. Lithium. Chlorine trifluoride. peroxy formic acid.

Hazardous decomposition products: Vanadium oxide.

Other Information

Corrosivity: No information available

Special Remarks on Corrosivity: No information available

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Principal Routes of Exposure:
Skin. Inhalation. Ingestion. Eyes.

Acute Toxicity

Component Information

Vanadium Pentoxide - 1314-62-1

- LD50/oral/rat** = 10 mg/kg Oral LD50 Rat
- LD50/oral/mouse** = 23 mg/kg Oral LD50 Mouse
- LD50/dermal/rat** = No information available
- LD50/dermal/rabbit** = 50 mg/kg Dermal LD50Rabbit
- LC50/inhalation/rat** = 2.21 mg/L Inhalation LC50 Rat 4 h
- LC50/inhalation/mouse** = No information available
- Other LD50 or LC50 information** = No information available

Product Information

LD50/oral/rat =
VALUE- Acute Tox Oral = 10mg/kg

LD50/oral/mouse =
Value - Acute Tox Oral = 23mg/kg

LD50/dermal/rabbit
VALUE-Acute Tox Dermal = 50mg/kg

LD50/dermal/rat
VALUE -Acute Tox Dermal = > 2500mg/kg

LC50/inhalation/rat
VALUE-Vapor = No information available
VALUE-Gas = No information available
VALUE-Dust/Mist = 2.21mg/l

LC50/Inhalation/mouse
VALUE-Vapor = No information available
VALUE - Gas = No information available
VALUE - Dust/Mist = No information available

Symptoms

Skin Contact: Causes skin irritation. May be fatal if absorbed through skin.

Eye Contact: Causes serious eye irritation.

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Inhalation

It causes respiratory tract irritation. The major target for Vanadium Pentoxide toxicity is the respiratory tract. It is an irritant of the eyes, nose, throat, and respiratory tract at 0.1 mg/m³ or greater. Bronchitis, nasal discharge, sore throat, shortness of breath or dyspnea, rales, chest pain, and productive cough(phlegm) can occur following acute exposure, with effects sometimes being delayed by several days and lasting up to 2 weeks. Higher exposures can produce bronchopneumonia, and pulmonary edema. Vanadium pentoxide can be absorbed through the lungs. Acute inhalation may also cause liver damage and kidney damage, and affect behavior/central nervous system (ataxia). A green tongue may occur with high-level acute exposure of Vanadium compounds. Larger acute exposure by inhalation can produce effects on the nervous system, including paralysis, respiratory depression, and convulsions, but these generally occur only in fatal exposures. Vanadium Pentoxide is a powerful vasoconstrictor and can cause renal hypertension.

Ingestion

Harmful if swallowed. Causes serious gastrointestinal tract irritation or burns with nausea, vomiting, severe abdominal pain, and harmless green tongue discoloration..

Aspiration hazard

No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure**Chronic Toxicity**

Repeated exposures by inhalation are associated with respiratory effects similar to those of acute exposure, except that the intensity increases with further exposures and lower doses. Chronic bronchitis, green tongue, conjunctivitis, pharyngitis, rhinitis, rales, chronic productive cough, shortness of breath, wheezing, tightness of the chest, and dermatitis have been reported. Onset of respiratory effects can be followed by systemic effects, including pallor, loss of appetite, anemia, nausea, headache, insomnia, nervousness, hypertension, dizziness, kidney damage, liver damage (fatty liver degeneration), tremor, psychological problems(hysteria, and depression), blindness. Chronic exposure is frequently associated with asthma, but it is not clear if it is the causitive agent..

Sensitization:

No information available

Mutagenic Effects:

May affect genetic material
Mutagenic effects on mammalian germ cells

Carcinogenic effects:

Not considered carcinogenic

| Components | ACGIH - Carcinogens | IARC | NTP | OSHA HCS - Carcinogens | Australia - Prohibited Carcinogenic Substances | Australia - Notifiable Carcinogenic Substances |
|--------------------|---|---------------------|------------|------------------------|--|--|
| Vanadium Pentoxide | A3 Confirmed Animal Carcinogen with Unknown Relevance to Humans | Monograph 86 [2006] | Not listed | Present | Not listed | Not listed |

Reproductive toxicity

Suspected of damaging fertility or the unborn child

Reproductive Effects:

May cause adverse reproductive effects based on animal data. May cause harm to the unborn child.

Developmental Effects:

No information available

Teratogenic Effects:

Showed adverse reproductive effects and teratogenic effects in animal experiments
May cause birth defects (teratogenic effects) based on animal test data

Specific Target Organ Toxicity

STOT - single exposure Respiratory Tract.
STOT - repeated exposure respiratory system.
Target Organs: Gastrointestinal tract. Respiratory system. Skin.

12. ECOLOGICAL INFORMATION

Ecotoxicity

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

Vanadium Pentoxide - 1314-62-1

Freshwater Fish Species Data: LC50 (Rainbow trout, donaldson trout (*Oncorhynchus mykiss*), 96 h): 6.1 mg/l Mortality
LC50 (Brook trout (*Salvelinus fontinalis*), 96h): 5.6-9.2 mg/l Mortality
LC50 (Fathead minnow (*Pimephales promelas*), 96 h): 13 mg/l Mortality

Water Flea Data: LC50 (*Daphnia magna*), 48 h: 1.52 mg/l Mortality

Persistence and degradability: No information available

Bioaccumulative potential: No information available

Mobility: No information available

13. DISPOSAL CONSIDERATIONS

Disposal Methods

Waste from residues / unused products:

Waste must be disposed of in accordance with Federal, State and Local regulation.

Contaminated packaging:

Empty containers should be taken for local recycling, recovery or waste disposal

| Components | RCRA - F Series Wastes | RCRA - K Series Wastes | RCRA - P Series Wastes | RCRA - U Series Wastes |
|--------------------|------------------------|------------------------|------------------------|------------------------|
| Vanadium Pentoxide | None | None | P120 | None |

14. TRANSPORT INFORMATION

DOT

UN-No: UN2862
Proper Shipping Name: Vanadium pentoxide
Hazard Class: 6.1
Subsidiary Risk:
Packing Group: III
ERG No: 151
Marine Pollutant: No data available
DOT RQ (lbs): No information available

Product code: V1010

Product name: VANADIUM
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14. TRANSPORT INFORMATION

Symbol(s): R4

TDG (Canada)
UN-No: UN2862
Proper Shipping Name: Vanadium pentoxide
Hazard Class: 6.1
Subsidiary Risk: No information available
Packing Group: III
Description: No information available

ADR
UN-No: UN2862
Proper Shipping Name: Vanadium pentoxide
Hazard Class: 6.1
Packing Group: III
Subsidiary Risk: No information available
Classification Code: No information available
Description: No information available
CEFIC Tremcard No: No information available

IMO / IMDG
UN-No: UN2862
Proper Shipping Name: Vanadium pentoxide
Hazard Class: 6.1
Subsidiary Risk: No information available
Packing Group: III
Description: No information available
IMDG Page: No information available
Marine Pollutant: No information available
EMS: F-A
MFAG: No information available
Maximum Quantity: No information available

RID
UN-No: UN2862
Proper Shipping Name: Vanadium pentoxide
Hazard Class: 6.1
Subsidiary Risk: No information available
Packing Group: III
Classification Code: No information available
Description: No information available

ICAO
UN-No: UN2862
Proper Shipping Name: Vanadium pentoxide
Hazard Class: 6.1
Subsidiary Risk: No information available
Packing Group: III
Description: No information available

IATA
UN-No: UN2862
Proper Shipping Name: Vanadium pentoxide
Hazard Class: 6.1
Subsidiary Risk: No information available
Packing Group: III

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14. TRANSPORT INFORMATION

ERG Code: 6L
Description: No information available

15. REGULATORY INFORMATION**International Inventories**

| Components | U.S. TSCA | KOREA KECL | Philippines (PICCS) | Japan ENCS | CHINA | Australia (AICS) | EINECS-No. |
|---------------------------|-----------|------------------|---------------------|-----------------|---------|------------------|-------------------|
| <i>Vanadium Pentoxide</i> | Present | Present KE-12750 | Present | Present (1)-559 | Present | Present | Present 215-239-8 |

U.S. Regulations*Vanadium Pentoxide*

Massachusetts RTK: Present
New Jersey RTK Hazardous Substance List: 1993
New Jersey (EHS) List: 1993 100 lb TPQ
New Jersey - Discharge Prevention - List of Hazardous Substances: Present
Pennsylvania RTK: Environmental hazard Present
Pennsylvania RTK - Environmental Hazard List Present
Minnesota - Hazardous Substance List: Present
New York Release Reporting - List of Hazardous Substances:
 1000 lb RQ
 100 lb RQ
Louisiana Reportable Quantity List for Pollutants: 1000lbfinal RQ
 454kgfinal RQ
California Directors List of Hazardous Substances: Present

California Prop. 65: Safe Drinking Water and Toxic Enforcement Act of 1986.**Chemicals Known to the State of California to Cause Cancer:**

This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Chemicals Known to the State of California to Cause Reproductive Toxicity:

This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

| Components | Carcinogen | Developmental Toxicity | Male Reproductive Toxicity | Female Reproductive Toxicity: |
|---------------------------|------------|------------------------|----------------------------|-------------------------------|
| <i>Vanadium Pentoxide</i> | carcinogen | Not Listed | Not Listed | Not Listed |

CERCLA/SARA

| Components | CERCLA - Hazardous Substances and their Reportable Quantities | Section 302 Extremely Hazardous Substances and TPQs | Section 302 Extremely Hazardous Substances and RQs | Section 313 - Chemical Category | Section 313 - Reporting <i>de minimis</i> |
|---------------------------|---|---|--|---------------------------------|---|
| <i>Vanadium Pentoxide</i> | 1000 lb final RQ 454 kg final RQ | 100 lb lower TPQ 10000 lb upper TPQ | None | None | None |

U.S. TSCA

| Components | TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS) | TSCA 8(d) -Health and Safety Reporting |
|---------------------------|---|--|
| <i>Vanadium Pentoxide</i> | Not Applicable | Not Applicable |

Canada

WHMIS hazard class:
 Non-controlled

Product code: V1010

Product name: VANADIUM
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Canada Controlled Products Regulation:

This product has been classified according to the hazard criteria of the CPR (Controlled Products Regulation) and the MSDS contains all of the information required by the CPR.

| Components | WHMIS Ingredient Disclosure List - |
|--------------------|------------------------------------|
| Vanadium Pentoxide | 0.1 % |

Inventory

| Components | Canada (DSL) | Canada (NDSL) |
|--------------------|--------------|---------------|
| Vanadium Pentoxide | Present | Not Listed |

| Components | CEPA Schedule I - Toxic Substances | CEPA - 2010 Greenhouse Gases Subject to Mandatory Reporting |
|--------------------|------------------------------------|---|
| Vanadium Pentoxide | Present | Not listed |

EU Classification**R-phrase(s)**

R37 - Irritating to respiratory system.

R63 - Possible risk of harm to the unborn child.

R68 - Possible risk of irreversible effects.

R20/22 - Harmful by inhalation and if swallowed.

R48/23 - Toxic: danger of serious damage to health by prolonged exposure through inhalation.

R51/53 - Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S -phrase(s)

S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S38 - In case of insufficient ventilation, wear suitable respiratory equipment.

S61 - Avoid release to the environment. Refer to special instructions/safety data sheets.

S37/39 - Wear suitable gloves and eye/face protection.

S 1/2 - Keep locked up and out of the reach of children.

S36/37 - Wear suitable protective clothing and gloves.

| Components | Classification | Concentration Limits: | Safety Phrases |
|--------------------|---|-----------------------|-------------------------|
| Vanadium Pentoxide | Xn; R20/22 Xi; R37 T; R48/23 N; R51-53 Repr.Cat.3; R63 Muta.Cat.3; R68 | No information | S1/2 S36/37 S38 S45 S61 |

The product is classified in accordance with Annex VI to Directive 67/548/EEC

Indication of danger:

Xn - Harmful.

Xi - Irritant.

T - Toxic

N - Dangerous for the environment.



16. OTHER INFORMATION

Revision Date: 03/23/2015
Prepared by: Sonia Owen

Disclaimer:

All chemicals may pose unknown hazards and should be used with caution. This Safety Data Sheet (SDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. The physical properties reported in this SDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.

End of Safety Data Sheet