Safety Data Sheet
acc. to OSHA HCS

Printing date 12/14/2020 *Reviewed on 12/14/2020*

1 Identification

· ***Product identifier***

· ***Product name:*** **Vanadium AA Standard: 1000 µg/mL V in 5% HNO3 [500ml bottle]**

· ***Part number:*** *5190-8324*
· ***Application of the substance / the mixture*** *Reagents and Standards for Analytical Chemical Laboratory Use*

· ***Details of the supplier of the safety data sheet***
· ***Manufacturer/Supplier:***
Agilent Technologies, Inc. *Tel: 800-227-9770*
5301 Stevens Creek Blvd
Santa Clara, CA 95051,
USA

· ***Information department:*** *e-mail: pdl-msds_author@agilent.com*
· ***Emergency telephone number:*** *CHEMTREC®: 1-800-424-9300*

2 Hazard(s) identification

· ***Classification of the substance or mixture***

GHS08 Health hazard

Carc. 2 *H351 Suspected of causing cancer.*
Repr. 2 *H361 Suspected of damaging fertility or the unborn child.*

GHS05 Corrosion

Met. Corr.1 *H290 May be corrosive to metals.*
Eye Dam. 1 *H318 Causes serious eye damage.*

GHS07

Skin Irrit. 2 *H315 Causes skin irritation.*

· ***Label elements***
· ***GHS label elements***
The product is classified and labeled according to the Globally Harmonized System (GHS).
· ***Hazard pictograms***

GHS05 GHS08

· ***Signal word*** *Danger*

· ***Hazard-determining components of labeling:***
nitric acid
· ***Hazard statements***
H290 May be corrosive to metals.
H315 Causes skin irritation.

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H318 Causes serious eye damage.
H351 Suspected of causing cancer.
H361 Suspected of damaging fertility or the unborn child.

· **Precautionary statements**

P280	Wear protective gloves/protective clothing/eye protection/face protection.
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/doctor.
P321	Specific treatment (see on this label).
P405	Store locked up.
P501	Dispose of contents/container in accordance with local/regional/national/international regulations.

· **Classification system:**
· **NFPA ratings (scale 0 - 4)**

Health = 3
Fire = 0
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**

Health = 3
Fire = 0
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Mixtures**
· **Description:** Aqueous solution.

· **Dangerous components:**

CAS: 7697-37-2 RTECS: QU5775000	nitric acid Ox. Liq. 2, H272; Acute Tox. 1, H330; Met. Corr.1, H290; Skin Corr. 1A, H314	<5%
CAS: 1314-62-1 RTECS: YW 2450000	vanadium pentoxide Muta. 2, H341; Carc. 2, H351; Repr. 2, H361; STOT RE 1, H372; Aquatic Chronic 2, H411; Acute Tox. 4, H302; Acute Tox. 4, H332; STOT SE 3, H335	<0.25%

· **Additional information:**
The concentration of the acid stated in this SDS is calculated as an absolute mass concentration (%w/v). This is less than the acid concentration stated on the product label and COA, which reflects a percent value of the commercially available concentrated aqueous form of the acid.

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4 First-aid measures

· ***Description of first aid measures***
· ***General information:*** *Immediately remove any clothing soiled by the product.*
· ***After inhalation:*** *Supply fresh air; consult doctor in case of complaints.*
· ***After skin contact:***
Immediately wash with water and soap and rinse thoroughly.
If skin irritation continues, consult a doctor.
· ***After eye contact:*** *Rinse opened eye for several minutes under running water. Then consult a doctor.*
· ***After swallowing:*** *Rinse mouth. Do not induce vomiting.*
· ***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 Fire-fighting measures

· ***Extinguishing media***
· ***Suitable extinguishing agents:*** *Use fire fighting measures that suit the environment.*
· ***Special hazards arising from the substance or mixture***
Formation of toxic gases is possible during heating or in case of fire.
· ***Advice for firefighters***
· ***Protective equipment:*** *Wear self-contained respiratory protective device.*

6 Accidental release measures

· ***Personal precautions, protective equipment and emergency procedures***
Wear protective equipment. Keep unprotected persons away.
· ***Environmental precautions:***
Dilute with plenty of water.
Do not allow to enter sewers/ surface or ground water.
· ***Methods and material for containment and cleaning up:***
Use neutralizing agent.
Dispose contaminated material as waste according to item 13.
Absorb liquid components with liquid-binding material.
DO NOT USE SAWDUST.
· ***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.
· ***Protective Action Criteria for Chemicals***

· ***PAC-1:***		
CAS: 7697-37-2	*nitric acid*	*0.16 ppm*
CAS: 1314-62-1	*vanadium pentoxide*	*0.64 mg/m³*

· ***PAC-2:***		
CAS: 7697-37-2	*nitric acid*	*24 ppm*
CAS: 1314-62-1	*vanadium pentoxide*	*7 mg/m³*

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· ***PAC-3:***

CAS: 7697-37-2	nitric acid	92 ppm
CAS: 1314-62-1	vanadium pentoxide	70 mg/m³

7 Handling and storage

· ***Handling:***
· ***Precautions for safe handling***
Store in cool, dry place in tightly closed receptacles.
Open and handle receptacle with care.
· ***Information about protection against explosions and fires:*** Keep respiratory protective device available.

· ***Conditions for safe storage, including any incompatibilities***
· ***Storage:***
· ***Requirements to be met by storerooms and receptacles:***
Please refer to the manufacturers certificate for specific storage and transport temperature conditions.
Store only in the original receptacle unless other advice is given on the CoA.
Keep container in a well-ventilated place. Keep away from sources of ignition and heat.
· ***Information about storage in one common storage facility:*** Store away from foodstuffs.
· ***Further information about storage conditions:*** Keep receptacle tightly sealed.
· ***Specific end use(s)*** No further relevant information available.

8 Exposure controls/personal protection

· ***Additional information about design of technical systems:*** No further data; see item 7.

· ***Control parameters***
· ***Components with limit values that require monitoring at the workplace:***
The following constituent is the only constituent of the product which has a PEL, TLV or other recommended exposure limit.
At this time, the remaining constituent has no known exposure limits.

CAS: 7697-37-2 nitric acid	
PEL	Long-term value: 5 mg/m³, 2 ppm
REL	Short-term value: 10 mg/m³, 4 ppm Long-term value: 5 mg/m³, 2 ppm
TLV	Short-term value: 10 mg/m³, 4 ppm Long-term value: 5.2 mg/m³, 2 ppm

· ***Additional information:*** The lists that were valid during the creation were used as basis.

· ***Exposure controls***
· ***Personal protective equipment:***
· ***General protective and hygienic measures:***
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the skin.
Avoid contact with the eyes and skin.

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· ***Breathing equipment:***
Not required.
Use suitable respiratory protective device in case of insufficient ventilation.
· ***Protection of hands:***
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
The protective gloves to be used must comply with the specifications of EC Directive 89/686/EEC and the related standard EN374

Protective gloves

· ***Material of gloves***
PVC gloves
Neoprene gloves
· ***Penetration time of glove material***
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.
· ***Eye protection:***

Tightly sealed goggles

9 Physical and chemical properties

· ***Information on basic physical and chemical properties***	
· ***General Information***	
· ***Appearance:***	
Form:	*Liquid*
Color:	*Yellow*
· ***Odor:***	*Odorless*
· ***Odor threshold:***	*Not determined.*
· ***pH-value:***	*<2*
· ***Change in condition***	
Melting point/Melting range:	*0 °C (32 °F)*
Boiling point/Boiling range:	*83 °C (181.4 °F)*
· ***Flash point:***	*Not applicable.*
· ***Flammability (solid, gaseous):***	*Not determined.*
· ***Ignition temperature:***	*Not determined*
· ***Decomposition temperature:***	*Not determined.*
· ***Auto igniting:***	*Product is not selfigniting.*
· ***Danger of explosion:***	*Not determined.*

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· ***Explosion limits:***	
Lower:	*Not determined.*
Upper:	*Not determined.*
· ***Vapor pressure at 20 °C (68 °F):***	*23 hPa (17.3 mm Hg)*
· ***Density at 20 °C (68 °F):***	*1.02751 g/cm³ (8.57457 lbs/gal)*
· ***Relative density***	*Not determined.*
· ***Vapor density***	*Not determined.*
· ***Evaporation rate***	*Not determined.*
· ***Solubility in / Miscibility with***	
Water:	*Fully miscible.*
· ***Partition coefficient (n-octanol/water):***	*Not determined.*
· ***Viscosity:***	
Dynamic:	*Not determined.*
Kinematic:	*Not determined.*
· ***Other information***	*No further relevant information available.*

10 Stability and reactivity

· ***Reactivity***
Stable under normal conditions.
No further relevant information available.
· ***Chemical stability*** *Stable under normal conditions.*
· ***Thermal decomposition / conditions to be avoided:***
Formation of toxic gases is possible during heating or in case of fire.
· ***Possibility of hazardous reactions*** *No dangerous reactions known.*
· ***Conditions to avoid*** *Heat.*
· ***Incompatible materials:***
Strong oxidizing agents.
Metals.
· ***Hazardous decomposition products:*** *Formation of toxic gases is possible during heating or in case of fire.*

11 Toxicological information

· ***Information on toxicological effects***
· ***Acute toxicity:***

· ***LD/LC50 values that are relevant for classification:***		
CAS: 7697-37-2 nitric acid		
Inhalative	*LC50/4 h*	*>2.65 mg/l (rat)*

· ***Primary irritant effect:***
· ***on the skin:*** *Irritant to skin and mucous membranes.*
· ***on the eye:*** *Strong irritant with the danger of severe eye injury.*
· ***Sensitization:*** *Based on available data, the classification criteria are not met.*
· ***Additional toxicological information:***
The product shows the following dangers according to internally approved calculation methods for preparations:

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Irritant

· ***Carcinogenic categories***

· ***IARC (International Agency for Research on Cancer)***		
CAS: 1314-62-1	*vanadium pentoxide*	*2B*

· ***NTP (National Toxicology Program)***
None of the ingredients is listed.

· ***OSHA-Ca (Occupational Safety & Health Administration)***
None of the ingredients is listed.

12 Ecological information

· ***Toxicity***

· ***Aquatic toxicity:***	
CAS: 7697-37-2 nitric acid	
LC50/48	*180 mg/l (crustacean)*

· ***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:***
Water hazard class 1 (Self-assessment): slightly hazardous for water
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
Must not reach bodies of water or drainage ditch undiluted or unneutralized.
· ***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:***
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· ***Uncleaned packagings:***
· ***Recommendation:*** *Dispose in accordance with national regulations.*
· ***Recommended cleansing agent:*** *Water, if necessary with cleansing agents.*

14 Transport information

· ***UN-Number***
· ***DOT, ADR, IMDG, IATA*** *UN3264*

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· **DOT**	Corrosive liquid, acidic, inorganic, n.o.s. (Nitric acid)
· **ADR**	3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRIC ACID)
· **IMDG, IATA**	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRIC ACID)
· **Transport hazard class(es)**	
· **DOT**	
	
· **Class**	8 Corrosive substances
· **Label**	8
· **ADR, IMDG, IATA**	
	
· **Class**	8 Corrosive substances
· **Label**	8
· **Packing group**	
· **DOT, ADR, IMDG, IATA**	III
· **Environmental hazards:**	Not applicable.
· **Special precautions for user**	Warning: Corrosive substances
· **Hazard identification number (Kemler code):**	80
· **EMS Number:**	F-A,S-B
· **Segregation groups**	Acids
· **Stowage Category**	A
· **Stowage Code**	SW2 Clear of living quarters.
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **ADR**	
· **Excepted quantities (EQ)**	Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml
· **UN "Model Regulation":**	UN 3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRIC ACID), 8, III

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
No further relevant information available.

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· ***Sara***

· ***Section 355 (extremely hazardous substances):***	
CAS: 7697-37-2	*nitric acid*
CAS: 1314-62-1	*vanadium pentoxide*

· ***Section 313 (Specific toxic chemical listings):***	
CAS: 7697-37-2	*nitric acid*
CAS: 1314-62-1	*vanadium pentoxide*

· ***TSCA (Toxic Substances Control Act):***
All components have the value ACTIVE.

· ***Hazardous Air Pollutants***
None of the ingredients is listed.

· ***Proposition 65***

· ***Chemicals known to cause cancer:***

CAS: 1314-62-1	*vanadium pentoxide*

· ***Chemicals known to cause reproductive toxicity for females:***
None of the ingredients is listed.

· ***Chemicals known to cause reproductive toxicity for males:***
None of the ingredients is listed.

· ***Chemicals known to cause developmental toxicity:***
None of the ingredients is listed.

· ***Carcinogenic categories***

· ***EPA (Environmental Protection Agency)***
None of the ingredients is listed.

· ***TLV (Threshold Limit Value established by ACGIH)***

CAS: 1314-62-1	*vanadium pentoxide*	*A3*

· ***NIOSH-Ca (National Institute for Occupational Safety and Health)***
None of the ingredients is listed.

· ***Hazard pictograms***

GHS05 GHS08

· ***Signal word*** *Danger*

· ***Hazard-determining components of labeling:***
nitric acid
· ***Hazard statements***
H290 May be corrosive to metals.
H315 Causes skin irritation.
H318 Causes serious eye damage.
H351 Suspected of causing cancer.
H361 Suspected of damaging fertility or the unborn child.

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· ***Precautionary statements***

P280	*Wear protective gloves/protective clothing/eye protection/face protection.*
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/doctor.*
P321	*Specific treatment (see on this label).*
P405	*Store locked up.*
P501	*Dispose of contents/container in accordance with local/regional/national/international regulations.*

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

16 Other information

The information contained in this document is based on Agilent's state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.

· ***Contact:***

· ***Date of preparation / last revision*** *12/14/2020 / -*

· ***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)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
Ox. Liq. 2: Oxidizing liquids – Category 2
Met. Corr.1: Corrosive to metals – Category 1
Acute Tox. 4: Acute toxicity – Category 4
Acute Tox. 1: Acute toxicity – Category 1
Skin Corr. 1A: Skin corrosion/irritation – Category 1A
Skin Irrit. 2: Skin corrosion/irritation – Category 2
Eye Dam. 1: Serious eye damage/eye irritation – Category 1
Muta. 2: Germ cell mutagenicity – Category 2
Carc. 2: Carcinogenicity – Category 2
Repr. 2: Reproductive toxicity – Category 2
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3
STOT RE 1: Specific target organ toxicity (repeated exposure) – Category 1
Aquatic Chronic 2: Hazardous to the aquatic environment - long-term aquatic hazard – Category 2

· ***Sources***

Tables 3.1 and 3.2 from Annex 6 of EC 1272/2008, EC 1907/2006, EH40/2005 as amended 2011, Registry of Toxic Effects of Chemical Substances (RTECS), The Dictionary of Substances and their Effects, 1st Edition, IUCLID.

· ***Data compared to the previous version altered.*** *All sections have been updated.*