Printing date 08/19/2019

GH-PURI

Reviewed on 08/19/2019

**1** Identification · Product identifier • Trade name: Antimony 1000µg/mL in 5% HNO3 + 0.1% HF · Article number: 10002-3 • Details of the supplier of the safety data sheet · Manufacturer/Supplier: High-Purity Standards PO Box 41727 Charleston, SC 29423 United States *Telephone:* +1-843-767-7900 *Fax:* +1-843-767-7906 highpuritystandards.com Email: info@highpuritystandards.com · Information department: Product safety department • Emergency telephone number: INFOTRAC Emergency telephone numbers 1-800-535-5053 Other emergency telephone numbers 1-352-323-3500

### 2 Hazard(s) identification

· Classification of the substance or mixture

GHS05 Corrosion

Met. Corr.1H290May be corrosive to metals.Skin Corr. 1AH314Causes severe skin burns and eye damage.Eye Dam. 1H318Causes serious eye damage.

· Label elements

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



· Signal word Danger

Hazard-determining components of labeling: nitric acid
Hazard statements H290 May be corrosive to metals. H314 Causes severe skin burns and eye damage.
Precautionary statements Keep only in original container. Do not breathe dusts or mists. Wash thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection. If swallowed: Rinse mouth. Do NOT induce vomiting.

(Contd. on page 2)

US

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Trade name: Antimony 1000µg/mL in 5% HNO3 + 0.1% HF

		(Contd. of page
	air): Take off immediately all contaminated clothing. Rinse skin with water/shower.	
	Remove person to fresh air and keep comfortable for breathing.	1 , 1
If in eyes: Rin Continue rinsi	se cautiously with water for several minutes. Remove contact lenses, if present a	ina easy to a
	ng. Ill a poison center/doctor.	
	thent (see on this label).	
	nated clothing before reuse.	
	e to prevent material damage.	
Store locked u		
	vive resistant container with a resistant inner liner.	
	tents/container in accordance with local/regional/national/international regulations.	
Classification		
NFPA ratings	(scale 0 - 4)	
	Health = 3	
	Fire = 0	
	Reactivity = 0	
HMIS-ratings	(scale 0 - 4)	
HEALTH 3	Health = 3	
FIRE 0	Fire = 0	
REACTIVITY 0	Reactivity = 0	
Other hazards	T and vPvB assessment	
<b>PBT:</b> Not appl		
vPvB: Not app		
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
Composition	n/information on ingredients	
Chamient sha	natoria dia mandra an	
Cnemicai cha	racterization: Mixtures Iixture of the substances listed below with nonhazardous additions.	
Description . 1	inture of the substances listed below with nonnazarubus dualitons.	
-		
Dangerous co		5.00
<b>Dangerous co</b> 7697-37-2 nit	ric acid	
Dangerous         col           7697-37-2         nit           7440-36-0         and	ric acid	5.0% 0.1% 0.1%

# 4 First-aid measures

• Description of first aid measures

· General information: Immediately remove any clothing soiled by the product.

7732-18-5 water, distilled, conductivity or of similar purity

• After inhalation: In case of unconsciousness place patient stably in side position for transportation.

• After skin contact: Immediately wash with water and soap and rinse thoroughly.

• After eye contact: Rinse opened eye for several minutes under running water. Then consult a doctor.

• After swallowing: Drink copious amounts of water and provide fresh air. Immediately call a doctor.

(Contd. on page 3)

94.8%

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Trade name: Antimony 1000µg/mL in 5% HNO3 + 0.1% HF

(Contd. of page 2)

- · 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
- During heating or in case of fire poisonous gases are produced.
- Advice for firefighters
- · Protective equipment: Mouth respiratory protective device.

#### 6 Accidental release measures

Wear prote	niratory protective device. Active equipment. Keep unprotected persons away.	
	ental precautions: Do not allow to enter sewers/ surface or ground water.	
	nd material for containment and cleaning up:	
	h liquid-binding material (sand, diatomite, acid binders, universal binders, saw	dust).
Use neutra	lizing agent.	,
Dispose co	ntaminated material as waste according to item 13.	
	quate ventilation.	
	to other sections	
	7 for information on safe handling.	
	8 for information on personal protection equipment.	
	13 for disposal information.	
	Action Criteria for Chemicals	
PAC-1:		
7697-37-2	nitric acid	0.16 ppm
7440-36-0	antimony	1.5 mg/m
7664-39-3	Hydrofluoric acid	1.0 ppm
PAC-2:		
7697-37-2	nitric acid	24 ppm
7440-36-0	antimony	13 mg/m
7664-39-3	Hydrofluoric acid	24 ppm
PAC-3:		
7697-37-2	nitric acid	92 ppm
	antimony	80 mg/m
7440-36-0		





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Trade name: Antimony 1000µg/mL in 5% HNO3 + 0.1% HF

(Contd. of page 3)

#### 7 Handling and storage

- · Handling:
- · Precautions for safe handling
- Ensure good ventilation/exhaustion at the workplace.
- Prevent formation of aerosols.
- 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:** No special requirements.
- · Information about storage in one common storage facility: Not required.
- 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 constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit.

At this time, the remaining constituent has no known exposure limits.

#### 7697-37-2 nitric acid

- PEL Long-term value: 5 mg/m<sup>3</sup>, 2 ppm REL Short-term value: 10 mg/m<sup>3</sup>, 4 ppm Long-term value: 5 mg/m<sup>3</sup>, 2 ppm
- TLV Short-term value: 10 mg/m<sup>3</sup>, 4 ppm Long-term value: 5.2 mg/m<sup>3</sup>, 2 ppm

#### 7664-39-3 Hydrofluoric acid

- PEL Long-term value: 3 ppm as F
- REL Long-term value: 2.5 mg/m<sup>3</sup>, 3 ppm Ceiling limit value: 5\* mg/m<sup>3</sup>, 6\* ppm \*15-min, as F
- *TLV* Long-term value: 0.41 mg/m<sup>3</sup>, 0.5 ppm Ceiling limit value: 1.64 mg/m<sup>3</sup>, 2 ppm as F; Skin, BEI

(Contd. on page 5)

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Trade name: Antimony 1000µg/mL in 5% HNO3 + 0.1% HF

**H-PURITY** ANDARDS

Incor	(Contd. of page 4
-	edients with biological limit values: I-39-3 Hydrofluoric acid
	3 mg/g creatinine
DLI	Medium: urine
	Time: prior to shift
	Parameter: Fluorides (background, nonspecific)
	10 mg/g creatinine
	Medium: urine
	Time: end of shift
	Parameter: Fluorides (background, nonspecific)
	itional information: The lists that were valid during the creation were used as basis.
	osure controls
	onal protective equipment: eral protective and hygienic measures:
	o away from foodstuffs, beverages and feed.
	ediately remove all soiled and contaminated clothing.
	h hands before breaks and at the end of work.
	d contact with the eyes.
	d contact with the eyes and skin.
	thing equipment:
	use of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure us
respi	iratory protective device that is independent of circulating air.
	ection of hands:
	ſħ
	Protective gloves
	The live gloves
	glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
	to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the
	nical mixture.
	ction of the glove material on consideration of the penetration times, rates of diffusion and the degradation
	erial of gloves
	selection of the suitable gloves does not only depend on the material, but also on further marks of quality ar
	es from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance
	love material can not be calculated in advance and has therefore to be checked prior to the application.
	exact break through time has to be found out by the manufacturer of the protective gloves and has to l
	exaci break inrough time has to be jound out by the manujacturer of the protective gloves and has to t rved.
	rvea. protection:
Lye	
(TO	Tightly sealed goggles
1	



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Trade name: Antimony 1000µg/mL in 5% HNO3 + 0.1% HF

		(Contd. of pag
<b>Physical and chemical proper</b>	ties	
• • •		
Information on basic physical and of General Information	cnemicai properties	
Appearance:		
Form:	Liquid	
Color:	colorless	
Odor:	Characteristic	
Odor threshold:	Not determined.	
pH-value:	Not determined.	
Change in condition		
Melting point/Melting range:	Undetermined.	
Boiling point/Boiling range:	Undetermined.	
Flash point:	Not applicable.	
Flammability (solid, gaseous):	Not applicable.	
Decomposition temperature:	Not determined.	
Auto igniting:	Product is not selfigniting.	
Danger of explosion:	Product does not present an explosion hazard.	
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):	1.02984 g/cm³ (8.59401 lbs/gal)	
Bulk density:	$1,030 \ kg/m^3$	
Relative density	Not determined.	
Vapor density	Not determined.	
Evaporation rate	Not determined.	
Solubility in / Miscibility with		
Water:	Not miscible or difficult to mix.	
Partition coefficient (n-octanol/wate	er): Not determined.	
Viscosity:		
Dynamic:	Not determined.	
Kinematic:	Not determined.	
Solvent content:		
Water:	94.8 %	
VOC content:		
	0.0 g/l / 0.00 lb/gal	
Solids content:	0.1 %	
Other information	No further relevant information available.	

(Contd. on page 7)



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Trade name: Antimony 1000µg/mL in 5% HNO3 + 0.1% HF

(Contd. of page 6)

#### **10 Stability and reactivity**

HIGH-PURITY

- · Reactivity No further relevant information available.
- · Chemical stability
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- · Possibility of hazardous reactions No dangerous reactions known.
- · Conditions to avoid No further relevant information available.
- · Incompatible materials: No further relevant information available.
- · Hazardous decomposition products: No dangerous decomposition products known.

# 11 Toxicological information

· Information on toxicological effects

• Acute toxicity:

· LD/LC50 values that are relevant for classification:

7440-36-0 antimony

*Oral LD50 7,000 mg/kg (rat)* 

7664-39-3 Hydrofluoric acid

*Oral LD50 1,276 mg/kg (rat)* 

- · Primary irritant effect:
- on the skin: Strong caustic effect on skin and mucous membranes.
- on the eye:
- Strong caustic effect.

Strong irritant with the danger of severe eye injury.

- Sensitization: No sensitizing effects known.
- · Additional toxicological information:
- The product shows the following dangers according to internally approved calculation methods for preparations: Corrosive
- Irritant

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

- · Carcinogenic categories
- · IARC (International Agency for Research on Cancer)

None of the ingredients is listed.

· 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: No further relevant information available.
- · Persistence and degradability No further relevant information available.

(Contd. on page 8)

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Trade name: Antimony 1000µg/mL in 5% HNO3 + 0.1% HF

(Contd. of page 7)

- · 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:* Disposal must be made according to official regulations.

UN-Number DOT, ADR, IMDG, IATA	UN3264
UN proper shipping name	
DOT	Corrosive liquid, acidic, inorganic, n.o.s. (Nitric acid)
ADR	3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O., (NITRIC ACID)
IMDG, IATA	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRI ACID)
Transport hazard class(es)	
CORROSIVE 8	
Class	8 Corrosive substances
Label	8
ADR, IMDG, IATA	
	8 Corrosive substances



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HIGH-PURITY STANDARDS

Reviewed on 08/19/2019

#### Trade name: Antimony 1000µg/mL in 5% HNO3 + 0.1% HF

	(Contd. of page
Label	8
Packing group	
DOT, ADR, IMDG, IATA	III
Environmental hazards:	Not applicable.
Special precautions for user	Warning: Corrosive substances
Danger code (Kemler):	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:	
DOT	
Quantity limitations	On passenger aircraft/rail: 5 L
Quantity umuations	On cargo aircraft only: 60 L
(2.2.	
ADR Encompted anomatician (EQ)	Code: El
Excepted quantities (EQ)	
	Maximum net quantity per inner packaging: 30 ml
	Maximum net quantity per outer packaging: 1000 ml
IMDG	
Limited quantities (LQ)	5L
Excepted quantities (EQ)	Code: El
	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
0	(NITRIC ACID), 8, III

# **15 Regulatory information**

 $\cdot$  Safety, health and environmental regulations/legislation specific for the substance or mixture  $\cdot$  Sara

• Section 355 (extremely hazardous substances):

7697-37-2 nitric acid

7664-39-3 Hydrofluoric acid

• Section 313 (Specific toxic chemical listings):

7697-37-2 nitric acid

7440-36-0 antimony

7664-39-3 Hydrofluoric acid

# • TSCA (Toxic Substances Control Act):

All components have the value ACTIVE.

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<sup>-</sup> US

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Trade name: Antimony 1000µg/mL in 5% HNO3 + 0.1% HF

(Contd. of page 9)

· Hazardous Air Pollutants

7664-39-3 Hydrofluoric acid

· Proposition 65

· Chemicals known to cause cancer:

None of the ingredients is listed.

IIGH-PURITY

· 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)

None of the ingredients is listed.

·NIOSH-Ca (National Institute for Occupational Safety and Health)

None of the ingredients is listed.

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



· Signal word Danger

· Hazard-determining components of labeling: nitric acid · Hazard statements H290 May be corrosive to metals. H314 Causes severe skin burns and eye damage. · Precautionary statements Keep only in original container. Do not breathe dusts or mists. Wash thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection. If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. 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. Immediately call a poison center/doctor. Specific treatment (see on this label). Wash contaminated clothing before reuse.

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Reviewed on 08/19/2019

Trade name: Antimony 1000µg/mL in 5% HNO3 + 0.1% HF

(Contd. of page 10)

Absorb spillage to prevent material damage. Store locked up. Store in corrosive resistant container with a resistant inner liner.

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**

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· Department issuing SDS: Environment protection department.

· Contact:	
High-Purity Standards	
Tel: 843-767-7900	
Fax: 843-767-7906	
· Date of preparation / last revision 08/19/2019 / -	
· Abbreviations and acronyms:	
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the Interno	ational
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)	
VOC: Volatile Organic Compounds (USA, EU)	
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	
BEI: Biological Exposure Limit	
Met. Corr.1: Corrosive to metals – Category 1	
Skin Corr. 1A: Skin corrosion/irritation – Category 1A	
Eye Dam. 1: Serious eye damage/eye irritation – Category 1	
······································	LIC.

Safety Data Sheet acc. to OSHA HCS

Printing date 08/26/2019

Reviewed on 08/26/2019

Identification	
Product identifier	
Trade name: <u>Hafnium 1000 µg/mL in 2% HNO3 + 0.5</u> %	6 HF
Article number: 100022-3	
Details of the supplier of the safety data sheet Manufacturer/Supplier: High-Purity Standards PO Box 41727 Charleston, SC 29423 United States Telephone: +1-843-767-7900 Fax: +1-843-767-7906 highpuritystandards.com Email: info@highpuritystandards.com	
• Information department: Product safety department • Emergency telephone number: INFOTRAC Emergency telephone numbers1-800-535-5053 Other emergency telephone numbers 1-352-323-3500	

# 2 Hazard(s) identification

· Classification of the substance or mixture



GHS06 Skull and crossbones

Acute Tox. 3 H311 Toxic in contact with skin.



Met. Corr.1H290 May be corrosive to metals.Skin Corr. 1AH314 Causes severe skin burns and eye damage.Eye Dam. 1H318 Causes serious eye damage.

· Label elements

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



· Signal word Danger

Hazard-determining components of labeling: nitric acid
Hydrofluoric acid
Hazard statements
H290 May be corrosive to metals.
H311 Toxic in contact with skin.

(Contd. on page 2)

US

#### Safety Data Sheet acc. to OSHA HCS

Printing date 08/26/2019

Reviewed on 08/26/2019

Trade name: Hafnium 1000 µg/mL in 2% HNO3 + 0.5% HF

(Contd. of page 1)

H314 Causes severe skin burns and eye damage. · Precautionary statements Keep only in original container. Do not breathe dusts or mists. Wash thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection. If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. *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. Immediately call a poison center/doctor. Specific treatment (see on this label). Take off immediately all contaminated clothing and wash it before reuse. Absorb spillage to prevent material damage. Store locked up. Store in corrosive resistant container with a resistant inner liner. Dispose of contents/container in accordance with local/regional/national/international regulations. · Classification system: · NFPA ratings (scale 0 - 4) Health = 3Fire = 0Reactivity = 0· HMIS-ratings (scale 0 - 4) HEALTH 3 Health = 3FIRE 0 Fire = 0**REACTIVITY O** 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:** Mixture of the substances listed below with nonhazardous additions.

· Dangerous components:		
7697-37-2 nitric acid	2.0%	
7664-39-3 Hydrofluoric acid	0.5%	
· Chemical identification of the substance/preparation		
7732-18-5 water, distilled, conductivity or of similar purity	97.4%	
7440-58-6 hafnium	0.1%	

(Contd. on page 3)



Printing date 08/26/2019

Reviewed on 08/26/2019

Trade name: Hafnium 1000 µg/mL in 2% HNO3 + 0.5% HF

(Contd. of page 2)

#### 4 First-aid measures

· Description of first aid measures

· General information:

Immediately remove any clothing soiled by the product.

- In case of irregular breathing or respiratory arrest provide artificial respiration.
- After inhalation: In case of unconsciousness place patient stably in side position for transportation.
- After skin contact: Immediately wash with water and soap and rinse thoroughly.
- After eye contact: Rinse opened eye for several minutes under running water. Then consult a doctor.
- After swallowing: Drink copious amounts of water and provide fresh air. Immediately call a doctor.
- 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
- During heating or in case of fire poisonous gases are produced.
- Advice for firefighters
- · Protective equipment: Mouth respiratory protective device.

#### 6 Accidental release measures

• Personal precautions, protective equipment and emergency procedures Mount respiratory protective device.

Wear protective equipment. Keep unprotected persons away.

- Environmental precautions: Do not allow to enter sewers/ surface or ground water.
- Methods and material for containment and cleaning up:

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

*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.
- · Protective Action Criteria for Chemicals

· PAC-1:	
7697-37-2 nitric acid	0.16 ppm
7664-39-3 Hydrofluoric acid	1.0 ppm
7440-58-6 hafnium	1.5 mg/m <sup>3</sup>
· PAC-2:	
7697-37-2 nitric acid	24 ppm
7664-39-3 Hydrofluoric acid	24 ppm
· · ·	(Contd. on page 4)

#### Safety Data Sheet acc. to OSHA HCS

Printing date 08/26/2019

Reviewed on 08/26/2019

Trade name: Hafnium 1000 µg/mL in 2% HNO3 + 0.5% HF

7440-58-6	hafnium	(Contd. of page 3) <i>17 mg/m<sup>3</sup></i>
• PAC-3:		
	nitric acid	92 ppm
7664-39-3	Hydrofluoric acid	44 ppm
7440-58-6	hafnium	99 mg/m <sup>3</sup>

# 7 Handling and storage

· Handling:

• *Precautions for safe handling* Ensure good ventilation/exhaustion at the workplace. Prevent formation of aerosols.

• 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: No special requirements.
- · Information about storage in one common storage facility: Not required.

• 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:		
7697-37-2 nitric acid		
PEL Long-term value: 5 mg/m <sup>3</sup> , 2 ppm		
REL Short-term value: 10 mg/m <sup>3</sup> , 4 ppm Long-term value: 5 mg/m <sup>3</sup> , 2 ppm		
<i>TLV</i> Short-term value: 10 mg/m <sup>3</sup> , 4 ppm Long-term value: 5.2 mg/m <sup>3</sup> , 2 ppm		
7664-39-3 Hydrofluoric acid		
PEL Long-term value: 3 ppm as F		
REL Long-term value: 2.5 mg/m <sup>3</sup> , 3 ppm Ceiling limit value: 5* mg/m <sup>3</sup> , 6* ppm *15-min, as F		
TLV Long-term value: 0.41 mg/m <sup>3</sup> , 0.5 ppm Ceiling limit value: 1.64 mg/m <sup>3</sup> , 2 ppm as F; Skin, BEI		
	(Contd. on page 5)	

Printing date 08/26/2019

Reviewed on 08/26/2019

*Trade name: Hafnium 1000 µg/mL in 2% HNO3 + 0.5% HF* 

	(Contd. of page 4)
· Ingredients with biological limit values:	
7664-39-3 Hydrofluoric acid	
BEI 3 mg/g creatinine	
Medium: urine	
Time: prior to shift	
Parameter: Fluorides (background, nonspecific)	
10 mg/g creatinine	
Medium: urine	
Time: end of shift	
Parameter: Fluorides (background, nonspecific)	
• 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 eyes.	
Avoid contact with the eyes and skin.	
· Breathing equipment:	
In case of brief exposure or low pollution use respiratory filter device. In case of intensive of	r longer exposure use
respiratory protective device that is independent of circulating air.	0 1
· Protection of hands:	
Protective gloves	
The glove material has to be impermeable and resistant to the product/ the substance/ the pre	paration.
Due to missing tests no recommendation to the glove material can be given for the product	
chemical mixture.	
Selection of the glove material on consideration of the penetration times, rates of diffusion an	d the degradation
• Material of gloves	a the degradation
The selection of the suitable gloves does not only depend on the material, but also on further	marks of quality and
varies from manufacturer to manufacturer. As the product is a preparation of several substar	
the glove material can not be calculated in advance and has therefore to be checked prior to	
· Penetration time of glove material	
The exact break through time has to be found out by the manufacturer of the protective	alower and has to be
observed.	sioves una nas io de
• Eve protection:	
Lye protection.	
Tightly sealed goggles	
1.5mmy section gobbies	



(Contd. on page 6)

US

(Contd. of page 5)

Safety Data Sheet acc. to OSHA HCS

Printing date 08/26/2019

Reviewed on 08/26/2019

*Trade name: Hafnium 1000 µg/mL in 2% HNO3 + 0.5% HF* 

Information on basic physical and c	hemical properties
General Information	
Appearance: Form:	Liquid
Color:	colorless
Odor:	Characteristic
Odor threshold:	Not determined.
pH-value:	Not determined.
Change in condition	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	100 °C (212 °F)
Flash point:	Not applicable.
Flammability (solid, gaseous):	Not applicable.
Decomposition temperature:	Not determined.
Auto igniting:	Product is not selfigniting.
Danger of explosion:	Product does not present an explosion hazard.
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):	1.01738 g/cm <sup>3</sup> (8.49004 lbs/gal)
Bulk density:	1,017 kg/m <sup>3</sup>
Relative density	Not determined.
Vapor density	Not determined.
Evaporation rate	Not determined.
Solubility in / Miscibility with	
Water:	Not miscible or difficult to mix.
Partition coefficient (n-octanol/wate	er): Not determined.
Viscosity:	
Dynamic:	Not determined.
Kinematic:	Not determined.
Solvent content:	
Water:	97.4%
VOC content:	0.00 %
	0.0 g/l / 0.00 lb/gal
Solids content:	0.1 %
Other information	No further relevant information available.

(Contd. on page 7)



Printing date 08/26/2019

Reviewed on 08/26/2019

*Trade name: Hafnium 1000 μg/mL in 2% HNO3 + 0.5% HF* 

(Contd. of page 6)

#### **10 Stability and reactivity**

- · Reactivity No further relevant information available.
- · Chemical stability
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- · Possibility of hazardous reactions No dangerous reactions known.
- · Conditions to avoid No further relevant information available.
- · Incompatible materials: No further relevant information available.
- · Hazardous decomposition products: No dangerous decomposition products known.

# **11 Toxicological information**

· Information on toxicological effects

• Acute toxicity:

· LD/LC50 values that are relevant for classification:

7664-39-3 Hydrofluoric acid

*Oral LD50 1,276 mg/kg (rat)* 

- Primary irritant effect:
- on the skin: Strong caustic effect on skin and mucous membranes.
- on the eye:
- Strong caustic effect.

Strong irritant with the danger of severe eye injury.

• Sensitization: No sensitizing effects known.

· Additional toxicological information:

The product shows the following dangers according to internally approved calculation methods for preparations: Toxic

- Corrosive
- Irritant

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

· Carcinogenic categories

· IARC (International Agency for Research on Cancer)

None of the ingredients is listed.

· 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: 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.

(Contd. on page 8)

# HIGH-PURITY STANDARDS

Printing date 08/26/2019

Reviewed on 08/26/2019

Trade name: Hafnium 1000 µg/mL in 2% HNO3 + 0.5% HF

(Contd. of page 7)

• 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.

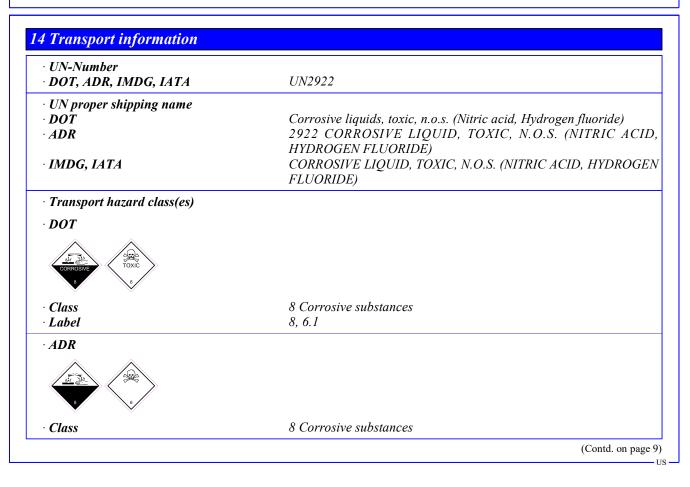
**13 Disposal considerations** 

• Waste treatment methods

· Recommendation:

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

- · Uncleaned packagings:
- Recommendation: Disposal must be made according to official regulations.







Printing date 08/26/2019

Reviewed on 08/26/2019

#### *Trade name: Hafnium 1000 µg/mL in 2% HNO3 + 0.5% HF*

	(Contd. of pag
Label	8+6.1
IMDG	
Class	8 Corrosive substances
Label	8/6.1
IATA	
Class Label	8 Corrosive substances 8 (6.1)
Packing group DOT, ADR, IMDG, IATA	III
Environmental hazards:	Not applicable.
Special precautions for user	Warning: Corrosive substances
Danger code (Kemler):	86
EMS Number:	F-A,S-B
Segregation groups	Acids
Stowage Category	В
Stowage Code	SW2 Clear of living quarters.
<i>Transport in bulk according to Annex</i> <i>MARPOL</i> 73/78 and the IBC Code	II of Not applicable.
Transport/Additional information:	
DOT	
Quantity limitations	On passenger aircraft/rail: 5 L
	On cargo aircraft only: 60 L
ADR	
Excepted quantities (EQ)	Code: El
	Maximum net quantity per inner packaging: 30 ml
	Maximum net quantity per outer packaging: 1000 ml
IMDG	
Limited quantities (LQ)	5L
Excepted quantities $(\widetilde{E}Q)$	Code: El
	Maximum net quantity per inner packaging: 30 ml
	Maximum net quantity per outer packaging: 1000 ml
UN "Model Regulation":	UN 2922 CORROSIVE LIQUID, TOXIC, N.O.S. (NITRIC ACI HYDROGEN FLUORIDE), 8 (6.1), III

(Contd. on page 10)

Printing date 08/26/2019

Reviewed on 08/26/2019

*Trade name: Hafnium 1000 μg/mL in 2% HNO3 + 0.5% HF* 

(Contd. of page 9)

#### **15 Regulatory information**

 $\cdot$  Safety, health and environmental regulations/legislation specific for the substance or mixture  $\cdot$  Sara

• Section 355 (extremely hazardous substances):

7697-37-2 nitric acid

7664-39-3 Hydrofluoric acid

· Section 313 (Specific toxic chemical listings):

7697-37-2 nitric acid

7664-39-3 Hydrofluoric acid

• TSCA (Toxic Substances Control Act):

All components have the value ACTIVE.

· Hazardous Air Pollutants

7664-39-3 Hydrofluoric acid

· Proposition 65

· Chemicals known to cause cancer:

None of the ingredients is listed.

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)

None of the ingredients is listed.

· NIOSH-Ca (National Institute for Occupational Safety and Health)

None of the ingredients is listed.

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



· Signal word Danger

• *Hazard-determining components of labeling:* nitric acid Hydrofluoric acid

#### Safety Data Sheet acc. to OSHA HCS

Printing date 08/26/2019

Reviewed on 08/26/2019

*Trade name: Hafnium 1000 μg/mL in 2% HNO3 + 0.5% HF* 

(Contd. of page 10)

· Hazard statements H290 May be corrosive to metals. H311 Toxic in contact with skin. H314 Causes severe skin burns and eye damage. · Precautionary statements Keep only in original container. Do not breathe dusts or mists. Wash thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection. If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. 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. Immediately call a poison center/doctor. Specific treatment (see on this label). Take off immediately all contaminated clothing and wash it before reuse. Absorb spillage to prevent material damage. Store locked up. Store in corrosive resistant container with a resistant inner liner. 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**

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- · Department issuing SDS: Environment protection department.
- · Contact: *High-Purity Standards* Tel: 843-767-7900 Fax: 843-767-7906 • Date of preparation / last revision 08/26/2019 / -· 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) VOC: Volatile Organic Compounds (USA, EU) 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 (Contd. on page 12)

Printing date 08/26/2019

Reviewed on 08/26/2019

*Trade name: Hafnium 1000 µg/mL in 2% HNO3 + 0.5% HF* 

(Contd. of page 11)

REL: Recommended Exposure Limit BEI: Biological Exposure Limit Met. Corr. 1: Corrosive to metals – Category 1 Acute Tox. 3: Acute toxicity – Category 3 Skin Corr. 1A: Skin corrosion/irritation – Category 1A Eye Dam. 1: Serious eye damage/eye irritation – Category 1



Printing date 08/21/2019

GH-PURI

Reviewed on 08/21/2019

# **1 Identification** · Product identifier • Trade name: Molybdenum 1000 µg/mL in 2% HNO3 + 0.1% HF · Article number: 100034-3 • Details of the supplier of the safety data sheet · Manufacturer/Supplier: High-Purity Standards PO Box 41727 Charleston, SC 29423 United States *Telephone:* +1-843-767-7900 *Fax:* +1-843-767-7906 highpuritystandards.com Email: info@highpuritystandards.com · Information department: Product safety department • Emergency telephone number: INFOTRAC Emergency telephone numbers 1-800-535-5053 Other emergency telephone numbers 1-352-323-3500

# 2 Hazard(s) identification

· Classification of the substance or mixture

GHS05 Corrosion

Met. Corr.1H290May be corrosive to metals.Skin Corr. 1AH314Causes severe skin burns and eye damage.Eye Dam. 1H318Causes serious eye damage.

· Label elements

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



· Signal word Danger

Hazard-determining components of labeling: nitric acid
Hazard statements H290 May be corrosive to metals. H314 Causes severe skin burns and eye damage.
Precautionary statements Keep only in original container. Do not breathe dusts or mists. Wash thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection. If swallowed: Rinse mouth. Do NOT induce vomiting.

(Contd. on page 2)

Printing date 08/21/2019

Reviewed on 08/21/2019

Trade name: Molybdenum 1000 µg/mL in 2% HNO3 + 0.1% HF

If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.	(Contd. of page 1)
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.	
Immediately call a poison center/doctor.	
Specific treatment (see on this label).	
Wash contaminated clothing before reuse. Absorb spillage to prevent material damage.	
Store locked up.	
Store in corrosive resistant container with a resistant inner liner.	
Dispose of contents/container in accordance with local/regional/national/international regulations	
· Classification system:	
NFPA ratings (scale 0 - 4)	
Health = 3	
Fire = 0	
3 0 Reactivity = 0	
HMIS-ratings (scale 0 - 4)	
HEALTH 3 $Health = 3$	
FIRE 0 $Fire = 0$	
<b>REACTIVITY</b> $0$ Reactivity = 0	
• Other hazards	
Results of PBT and vPvB assessment	
• <b><i>PBT</i></b> : Not applicable.	
• <b>vPvB:</b> Not applicable.	
3 Composition/information on ingredients	
· Chemical characterization: Mixtures	
• Description: Mixture of the substances listed below with nonhazardous additions.	
· Dangerous components:	
7697-37-2 nitric acid	2.0%
7664-39-3 Hydrofluoric acid	0.1%
Chemical identification of the substance/preparation	I
7732-18-5 water, distilled, conductivity or of similar purity	97.8%
7439-98-7 molybdenum	0.1%
1 105 70 7 more de la m	0.170

# 4 First-aid measures

• Description of first aid measures

· General information: Immediately remove any clothing soiled by the product.

• After inhalation: In case of unconsciousness place patient stably in side position for transportation.

• *After skin contact: Immediately wash with water and soap and rinse thoroughly.* 

• After eye contact: Rinse opened eye for several minutes under running water. Then consult a doctor.

• After swallowing: Drink copious amounts of water and provide fresh air. Immediately call a doctor.

(Contd. on page 3) US

*Printing date 08/21/2019* 

Reviewed on 08/21/2019

Trade name: Molybdenum 1000 µg/mL in 2% HNO3 + 0.1% HF

(Contd. of page 2)

- · 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

During heating or in case of fire poisonous gases are produced.

- · Advice for firefighters
- · Protective equipment: Mouth respiratory protective device.

#### 6 Accidental release measures

	recautions, protective equipment and emergency procedures		
1	viratory protective device.		
	ctive equipment. Keep unprotected persons away.		
	ental precautions: No special measures required.		
	nd material for containment and cleaning up:		
	h liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).		
	lizing agent.		
	ntaminated material as waste according to item 13. equate ventilation.		
	to other sections		
	7 for information on safe handling.		
	8 for information on personal protection equipment.		
	13 for disposal information.		
	Action Criteria for Chemicals		
PAC-1:			
7697-37-2	nitric acid	0.	16 pp
7439-98-7	molybdenum	3(	0 mg/
7664-39-3	Hydrofluoric acid	1.	0 ppr
PAC-2:			
7697-37-2	nitric acid	24	ррт
7439-98-7	molybdenum	33(	0 mg/.
7664-39-3	Hydrofluoric acid	24	ррт
PAC-3:			
7697-37-2	nitric acid	92 pp	рт
7439-98-7	molybdenum	2,000	0 mg/1
7/// 20.2	Hydrofluoric acid	44 pp	рт





Printing date 08/21/2019

Reviewed on 08/21/2019

Trade name: Molybdenum 1000 µg/mL in 2% HNO3 + 0.1% HF

(Contd. of page 3)

#### 7 Handling and storage

- · Handling:
- · Precautions for safe handling
- Ensure good ventilation/exhaustion at the workplace.
- Prevent formation of aerosols.
- 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: No special requirements.
- · Information about storage in one common storage facility: Not required.
- 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

· Com	ponents with limit values that require monitoring at the workplace:
7697	7-37-2 nitric acid
PEL	Long-term value: 5 mg/m <sup>3</sup> , 2 ppm
REL	Short-term value: 10 mg/m <sup>3</sup> , 4 ppm
	Long-term value: 5 mg/m <sup>3</sup> , 2 ppm
TLV	Short-term value: 10 mg/m <sup>3</sup> , 4 ppm
	Long-term value: 5.2 mg/m <sup>3</sup> , 2 ppm
7664	1-39-3 Hydrofluoric acid
PEL	Long-term value: 3 ppm
	as F
REL	Long-term value: 2.5 mg/m <sup>3</sup> , 3 ppm
	Ceiling limit value: 5* mg/m <sup>3</sup> , 6* ppm
	*15-min, as F
TLV	Long-term value: $0.41 \text{ mg/m}^3$ , $0.5 \text{ ppm}$
	Ceiling limit value: 1.64 mg/m³, 2 ppm as F; Skin, BEI
· Ingro	edients with biological limit values:
7664	1-39-3 Hydrofluoric acid
BEI	3 mg/g creatinine
	Medium: urine
	Time: prior to shift
	Parameter: Fluorides (background, nonspecific)
	10 mg/g creatinine
	Medium: urine
	Time: end of shift
	Parameter: Fluorides (background, nonspecific)
	(Contd. on page 5)
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#### Safety Data Sheet acc. to OSHA HCS

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

Printing date 08/21/2019

Reviewed on 08/21/2019

Trade name: Molybdenum 1000 µg/mL in 2% HNO3 + 0.1% HF

(Contd. of page 4)

· 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. Avoid contact with the eyes. Avoid contact with the eyes and skin.

• Breathing equipment:

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

• Protection of hands:



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation  $\cdot$  *Material of gloves* 

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

· 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: colorless Odor: Characteristic · Odor threshold: Not determined. Not determined. · *pH-value*: · Change in condition Melting point/Melting range: Undetermined. (Contd. on page 6)

Printing date 08/21/2019

Reviewed on 08/21/2019

#### Trade name: Molybdenum 1000 µg/mL in 2% HNO3 + 0.1% HF

	(Contd. c	of page
Boiling point/Boiling range:	100 °C (212 °F)	
Flash point:	Not applicable.	
Flammability (solid, gaseous):	Not applicable.	
Decomposition temperature:	Not determined.	
Auto igniting:	Product is not selfigniting.	
Danger of explosion:	Product does not present an explosion hazard.	
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):	1.01828 g/cm³ (8.49755 lbs/gal)	
Bulk density:	1,018 kg/m <sup>3</sup>	
Relative density	Not determined.	
Vapor density	Not determined.	
Evaporation rate	Not determined.	
Solubility in / Miscibility with		
Water:	Not miscible or difficult to mix.	
Partition coefficient (n-octanol/wate	er): Not determined.	
Viscosity:		
Dynamic:	Not determined.	
Kinematic:	Not determined.	
Solvent content:		
Water:	97.8 %	
VOC content:	0.00 %	
	0.0 g/l / 0.00 lb/gal	
Solids content:	0.0 %	
Other information	No further relevant information available.	

# **10 Stability and reactivity**

• *Reactivity* No further relevant information available.

- · Chemical stability
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- · Possibility of hazardous reactions No dangerous reactions known.
- · Conditions to avoid No further relevant information available.
- · Incompatible materials: No further relevant information available.
- · Hazardous decomposition products: No dangerous decomposition products known.

(Contd. on page 7)



Printing date 08/21/2019

Reviewed on 08/21/2019

Trade name: Molybdenum 1000 µg/mL in 2% HNO3 + 0.1% HF

(Contd. of page 6)

#### **11 Toxicological information**

· Information on toxicological effects

• Acute toxicity:

· LD/LC50 values that are relevant for classification:

7664-39-3 Hydrofluoric acid

Oral LD50 1,276 mg/kg (rat)

- · Primary irritant effect:
- on the skin: Strong caustic effect on skin and mucous membranes.
- on the eye:
- Strong caustic effect.

Strong irritant with the danger of severe eye injury.

- · Sensitization: No sensitizing effects known.
- · Additional toxicological information:

*The product shows the following dangers according to internally approved calculation methods for preparations: Corrosive* 

Irritant

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

· Carcinogenic categories

· IARC (International Agency for Research on Cancer)

None of the ingredients is listed.

· 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: 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:

Not hazardous for water.

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.



# Safety Data Sheet acc. to OSHA HCS

Printing date 08/21/2019

Reviewed on 08/21/2019

Trade name: Molybdenum 1000 µg/mL in 2% HNO3 + 0.1% HF

(Contd. of page 7)

# **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: Disposal must be made according to official regulations.* 

UN-Number	
DOT, ADR, IMDG, IATA	UN3264
· UN proper shipping name	
DOT	Corrosive liquid, acidic, inorganic, n.o.s. (Nitric acid)
ADR	3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.
IMDG, IATA	(NITRIC ACID) CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRI
	ACID
Transport hazard class(es)	
DOT	
CORROSIVE 8	
· Class	8 Corrosive substances
Label	8
e e	
· Class	8 Corrosive substances
Label	8
Packing group	
DOT, ADR, IMDG, IATA	III
Environmental hazards:	Not applicable.
Special precautions for user	Warning: Corrosive substances
Danger code (Kemler):	80
EMS Number:	F-A,S-B
Segregation groups	Acids
Stowage Category	A

#### Safety Data Sheet acc. to OSHA HCS

Printing date 08/21/2019

Reviewed on 08/21/2019

#### Trade name: Molybdenum 1000 µg/mL in 2% HNO3 + 0.1% HF

	(Contd. of page a
Transport in bulk according to Annex II of	
	Not applicable.
Transport/Additional information:	
DOT	
Quantity limitations	On passenger aircraft/rail: 5 L
~ `	On cargo aircraft only: 60 L
ADR	
Excepted quantities (EQ)	Code: E1
	Maximum net quantity per inner packaging: 30 ml
	Maximum net quantity per outer packaging: 1000 ml
IMDG	
Limited quantities (LQ)	5L
Excepted quantities $(\widetilde{E}Q)$	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**

 $\cdot$  Safety, health and environmental regulations/legislation specific for the substance or mixture  $\cdot$  Sara

• Section 355 (extremely	hazardous substances):
--------------------------	------------------------

7697-37-2 nitric acid

7664-39-3 Hydrofluoric acid

· Section 313 (Specific toxic chemical listings):

7697-37-2 nitric acid

7664-39-3 Hydrofluoric acid

• TSCA (Toxic Substances Control Act):

All components have the value ACTIVE.

· Hazardous Air Pollutants

7664-39-3 Hydrofluoric acid

· Proposition 65

• Chemicals known to cause cancer:

None of the ingredients is listed.

· 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.

(Contd. on page 10)

<sup>•</sup> US

Printing date 08/21/2019

Reviewed on 08/21/2019

Trade name: Molybdenum 1000 µg/mL in 2% HNO3 + 0.1% HF

(Contd. of page 9)

AЗ

· Carcinogenic categories

· EPA (Environmental Protection Agency)

None of the ingredients is listed.

· TLV (Threshold Limit Value established by ACGIH)

7439-98-7 molybdenum

· NIOSH-Ca (National Institute for Occupational Safety and Health)

None of the ingredients is listed.

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



· Signal word Danger

· Hazard-determining components of labeling: nitric acid · Hazard statements H290 May be corrosive to metals. H314 Causes severe skin burns and eye damage. · Precautionary statements Keep only in original container. Do not breathe dusts or mists. Wash thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection. If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. 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. Immediately call a poison center/doctor. Specific treatment (see on this label). Wash contaminated clothing before reuse. Absorb spillage to prevent material damage. Store locked up. Store in corrosive resistant container with a resistant inner liner. 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**

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· Department issuing SDS: Environment protection department.

(Contd. on page 11)

US

Printing date 08/21/2019

Reviewed on 08/21/2019

# Trade name: Molybdenum 1000 µg/mL in 2% HNO3 + 0.1% HF

(Co	ontd. of page 10)
· Contact:	
High-Purity Standards	
Tel: 843-767-7900	
Fax: 843-767-7906	
• Date of preparation / last revision 08/21/2019 / -	
· Abbreviations and acronyms:	
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning th	e 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) VOC: Volatile Organic Compounds (USA, EU)	
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	
BEI: Biological Exposure Limit	
Met. Corr.1: Corrosive to metals – Category 1	
Skin Corr. 1A: Skin corrosion/irritation – Category 1A	
Eye Dam. 1: Serious eye damage/eye irritation – Category 1	
	US



Safety Data Sheet acc. to OSHA HCS

Printing date 08/23/2019

Reviewed on 08/23/2019

Product identifier
Trade name: <u>Niobium 1000 µg/mL in 2% HNO3 + 0.5% HF</u>
Article number: 100037-3
Details of the supplier of the safety data sheet Manufacturer/Supplier: High-Purity Standards PO Box 41727 Charleston, SC 29423 United States Telephone: +1-843-767-7900 Fax: +1-843-767-7906 highpuritystandards.com Email: info@highpuritystandards.com
<b>Information department:</b> Product safety department <b>Emergency telephone number:</b> INFOTRAC Emergency telephone numbers1-800-535-5053 Other emergency telephone numbers 1-352-323-3500

# 2 Hazard(s) identification

· Classification of the substance or mixture



GHS06 Skull and crossbones

Acute Tox. 3 H311 Toxic in contact with skin.



Met. Corr.1H290 May be corrosive to metals.Skin Corr. 1AH314 Causes severe skin burns and eye damage.Eye Dam. 1H318 Causes serious eye damage.

· Label elements

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



· Signal word Danger

Hazard-determining components of labeling: nitric acid
Hydrofluoric acid
Hazard statements
H290 May be corrosive to metals.
H311 Toxic in contact with skin.

(Contd. on page 2)

US

#### Safety Data Sheet acc. to OSHA HCS

Printing date 08/23/2019

Reviewed on 08/23/2019

Trade name: Niobium 1000 µg/mL in 2% HNO3 + 0.5% HF

(Contd. of page 1)

H314 Causes severe skin burns and eye damage. · Precautionary statements Keep only in original container. Do not breathe dusts or mists. Wash thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection. If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. *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. Immediately call a poison center/doctor. Specific treatment (see on this label). Take off immediately all contaminated clothing and wash it before reuse. Absorb spillage to prevent material damage. Store locked up. Store in corrosive resistant container with a resistant inner liner. Dispose of contents/container in accordance with local/regional/national/international regulations. · Classification system: · NFPA ratings (scale 0 - 4) Health = 3Fire = 0Reactivity = 0· HMIS-ratings (scale 0 - 4) HEALTH 3 Health = 3FIRE 0 Fire = 0**REACTIVITY O** 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: Mixture of the substances listed below with nonhazardous additions.

· Dangerous components:		
7697-37-2	nitric acid	2.0%
7664-39-3	Hydrofluoric acid	0.5%
· Chemical identification of the substance/preparation		
7732-18-5	water, distilled, conductivity or of similar purity	97.4%
7440-03-1	niobium	0.1%

(Contd. on page 3)

# HIGH-PURITY STANDARDS

### Safety Data Sheet acc. to OSHA HCS

Printing date 08/23/2019

Reviewed on 08/23/2019

Trade name: Niobium 1000 µg/mL in 2% HNO3 + 0.5% HF

(Contd. of page 2)

## 4 First-aid measures

· Description of first aid measures

· General information:

Immediately remove any clothing soiled by the product.

- In case of irregular breathing or respiratory arrest provide artificial respiration.
- After inhalation: In case of unconsciousness place patient stably in side position for transportation.
- After skin contact: Immediately wash with water and soap and rinse thoroughly.
- After eye contact: Rinse opened eye for several minutes under running water. Then consult a doctor.
- After swallowing: Drink copious amounts of water and provide fresh air. Immediately call a doctor.
- 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
- During heating or in case of fire poisonous gases are produced.
- Advice for firefighters
- · Protective equipment: Mouth respiratory protective device.

# 6 Accidental release measures

• Personal precautions, protective equipment and emergency procedures Mount respiratory protective device.

Wear protective equipment. Keep unprotected persons away.

- Environmental precautions: Do not allow to enter sewers/ surface or ground water.
- Methods and material for containment and cleaning up:

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

*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.
- · Protective Action Criteria for Chemicals

• PAC-1:		
ו 7697-37-2	nitric acid	0.16 ppm
7664-39-3	Hydrofluoric acid	1.0 ppm
ו 7440-03-1	<i>iiobium</i>	30 mg/m <sup>3</sup>
· PAC-2:		
ו 7697-37-2	nitric acid	24 ppm
7664-39-3	Hydrofluoric acid	24 ppm
•		(Contd. on page 4)

# HIGH-PURITY STANDARDS

# Safety Data Sheet acc. to OSHA HCS

Printing date 08/23/2019

Reviewed on 08/23/2019

*Trade name: Niobium 1000 µg/mL in 2% HNO3 + 0.5% HF* 

7440-03-1	niobium	(Contd. of page 3) 330 mg/m <sup>3</sup>
• PAC-3:		
	nitric acid	92 ppm
7664-39-3	Hydrofluoric acid	44 ppm
7440-03-1	niobium	$2,000 \text{ mg/m}^3$

# 7 Handling and storage

· Handling:

• *Precautions for safe handling* Ensure good ventilation/exhaustion at the workplace. Prevent formation of aerosols.

• 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: No special requirements.
- · Information about storage in one common storage facility: Not required.

• 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

· Com	ponents with limit values that require monitoring at the workplace:
7697-	-37-2 nitric acid
PEL	Long-term value: 5 mg/m <sup>3</sup> , 2 ppm
	Short-term value: 10 mg/m³, 4 ppm Long-term value: 5 mg/m³, 2 ppm
	Short-term value: 10 mg/m <sup>3</sup> , 4 ppm Long-term value: 5.2 mg/m <sup>3</sup> , 2 ppm
7664	-39-3 Hydrofluoric acid
	Long-term value: 3 ppm as F
	Long-term value: 2.5 mg/m <sup>3</sup> , 3 ppm Ceiling limit value: 5* mg/m <sup>3</sup> , 6* ppm *15-min, as F
	Long-term value: 0.41 mg/m <sup>3</sup> , 0.5 ppm Ceiling limit value: 1.64 mg/m <sup>3</sup> , 2 ppm as F; Skin, BEI
	(Contd. on page 5)

US

(Contd. on page 6)

# Safety Data Sheet acc. to OSHA HCS

*Printing date 08/23/2019* 

Reviewed on 08/23/2019

*Trade name: Niobium 1000 µg/mL in 2% HNO3 + 0.5% HF* 

	(Contd. of page 4)
-	edients with biological limit values:
7664	1-39-3 Hydrofluoric acid
BEI	3 mg/g creatinine
	Medium: urine
	Time: prior to shift
	Parameter: Fluorides (background, nonspecific)
	10 mg/g creatinine
	Medium: urine
	Time: end of shift
	Parameter: Fluorides (background, nonspecific)
· Add	itional information: The lists that were valid during the creation were used as basis.
·Exp	osure controls
· Pers	onal protective equipment:
· Gen	eral protective and hygienic measures:
Кеер	o away from foodstuffs, beverages and feed.
Imm	ediately remove all soiled and contaminated clothing.
Was	h hands before breaks and at the end of work.
	e protective clothing separately.
	d contact with the eyes.
	d contact with the eyes and skin.
	ithing equipment:
	use of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use
	iratory protective device that is independent of circulating air.
	ection of hands:
1100	
111	Protective gloves
The	glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
	to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the
	nical mixture.
	ction of the glove material on consideration of the penetration times, rates of diffusion and the degradation
	erial of gloves
	selection of the suitable gloves does not only depend on the material, but also on further marks of quality and
	es from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of
	glove material can not be calculated in advance and has therefore to be checked prior to the application.
	etration time of glove material
	exact break through time has to be found out by the manufacturer of the protective gloves and has to be
	exact break infolgen time has to be found out by the manufacturer of the protective gloves and has to be rved.
	protection:
Lye	
	Tightly sealed goggles



Printing date 08/23/2019

Reviewed on 08/23/2019

## *Trade name: Niobium 1000 µg/mL in 2% HNO3 + 0.5% HF*

(Contd. of page 5)

Information on basic physical and c	chemical properties
General Information	nemicu properites
Appearance:	
Form:	Liquid
Color:	colorless
Odor:	Characteristic
Odor threshold:	Not determined.
pH-value:	Not determined.
Change in condition	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	100 °C (212 °F)
Flash point:	Not applicable.
Flammability (solid, gaseous):	Not applicable.
Decomposition temperature:	Not determined.
Auto igniting:	Product is not selfigniting.
Danger of explosion:	Product does not present an explosion hazard.
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):	1.01264 g/cm³ (8.45048 lbs/gal)
Bulk density:	1,013 kg/m <sup>3</sup>
Relative density	Not determined.
Vapor density	Not determined.
Evaporation rate	Not determined.
Solubility in / Miscibility with	
Water:	Not miscible or difficult to mix.
Partition coefficient (n-octanol/wate	r): Not determined.
Viscosity:	
Dynamic:	Not determined.
Kinematic:	Not determined.
Solvent content:	
Water:	97.4 %
VOC content:	0.00 %
	0.0 g/l / 0.00 lb/gal
Solids content:	0.1 %
Other information	No further relevant information available.

(Contd. on page 7)

US



Printing date 08/23/2019

Reviewed on 08/23/2019

Trade name: Niobium 1000 µg/mL in 2% HNO3 + 0.5% HF

(Contd. of page 6)

### **10 Stability and reactivity**

- · Reactivity No further relevant information available.
- · Chemical stability
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- · Possibility of hazardous reactions No dangerous reactions known.
- · Conditions to avoid No further relevant information available.
- · Incompatible materials: No further relevant information available.
- · Hazardous decomposition products: No dangerous decomposition products known.

# **11 Toxicological information**

· Information on toxicological effects

• Acute toxicity:

· LD/LC50 values that are relevant for classification:

7664-39-3 Hydrofluoric acid

*Oral LD50 1,276 mg/kg (rat)* 

- Primary irritant effect:
- on the skin: Strong caustic effect on skin and mucous membranes.
- on the eye:
- Strong caustic effect.

Strong irritant with the danger of severe eye injury.

• Sensitization: No sensitizing effects known.

· Additional toxicological information:

The product shows the following dangers according to internally approved calculation methods for preparations: Toxic

- Corrosive
- Irritant

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

· Carcinogenic categories

· IARC (International Agency for Research on Cancer)

None of the ingredients is listed.

· 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: 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.

(Contd. on page 8)

# HIGH-PURITY STANDARDS

Printing date 08/23/2019

Reviewed on 08/23/2019

Trade name: Niobium 1000 µg/mL in 2% HNO3 + 0.5% HF

(Contd. of page 7)

• Additional ecological information:

HIGH-PURITY

· 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:* Disposal must be made according to official regulations.

Corrosive liquids, toxic, n.o.s. (Nitric acid, Hydrogen fluoride) 2922 CORROSIVE LIQUID, TOXIC, N.O.S. (NITRIC ACII HYDROGEN FLUORIDE) CORROSIVE LIQUID, TOXIC, N.O.S. (NITRIC ACID, HYDROGE FLUORIDE)
HYDROGEN FLUORIDE) CORROSIVE LIQUID, TOXIC, N.O.S. (NITRIC ACID, HYDROGE
8 Corrosive substances 8, 6.1
8 Corrosive substances



*Printing date 08/23/2019* 

Reviewed on 08/23/2019

# *Trade name: Niobium 1000 µg/mL in 2% HNO3 + 0.5% HF*

	(Contd. of pag
Label	8+6.1
IMDG	
Class	8 Corrosive substances
Label	8/6.1
IATA	
Class Label	8 Corrosive substances 8 (6.1)
Packing group DOT, ADR, IMDG, IATA	III
Environmental hazards:	Not applicable.
Special precautions for user	Warning: Corrosive substances
Danger code (Kemler):	86
EMS Number:	F-A,S-B
Segregation groups	Strong acids
Stowage Category	В
Stowage Code	SW2 Clear of living quarters.
<i>Transport in bulk according to Annex</i> <i>MARPOL73/78 and the IBC Code</i>	II of Not applicable.
Transport/Additional information:	
DOT	
Quantity limitations	On passenger aircraft/rail: 5 L On cargo aircraft only: 60 L
ADR	
Excepted quantities (EQ)	Code: El
	Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml
IMDG	
Limited quantities (LQ)	5L
Excepted quantities (EQ)	Code: El
	Maximum net quantity per inner packaging: 30 ml
	Maximum net quantity per outer packaging: 1000 ml
UN "Model Regulation":	UN 2922 CORROSIVE LIQUID, TOXIC, N.O.S. (NITRIC ACI HYDROGEN FLUORIDE), 8 (6.1), III

(Contd. on page 10)

*Printing date 08/23/2019* 

Reviewed on 08/23/2019

*Trade name: Niobium 1000 µg/mL in 2% HNO3 + 0.5% HF* 

(Contd. of page 9)

## **15 Regulatory information**

 $\cdot$  Safety, health and environmental regulations/legislation specific for the substance or mixture  $\cdot$  Sara

• Section 355 (extremely hazardous substances):

7697-37-2 nitric acid

7664-39-3 Hydrofluoric acid

· Section 313 (Specific toxic chemical listings):

7697-37-2 nitric acid

7664-39-3 Hydrofluoric acid

• TSCA (Toxic Substances Control Act):

All components have the value ACTIVE.

· Hazardous Air Pollutants

7664-39-3 Hydrofluoric acid

· Proposition 65

· Chemicals known to cause cancer:

None of the ingredients is listed.

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)

None of the ingredients is listed.

·NIOSH-Ca (National Institute for Occupational Safety and Health)

None of the ingredients is listed.

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



· Signal word Danger

• *Hazard-determining components of labeling:* nitric acid Hydrofluoric acid

# HIGH-PURITY STANDARDS

# Safety Data Sheet acc. to OSHA HCS

Printing date 08/23/2019

Reviewed on 08/23/2019

Trade name: Niobium 1000 µg/mL in 2% HNO3 + 0.5% HF

(Contd. of page 10)

· Hazard statements H290 May be corrosive to metals. H311 Toxic in contact with skin. H314 Causes severe skin burns and eye damage. · Precautionary statements Keep only in original container. Do not breathe dusts or mists. Wash thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection. If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. 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. Immediately call a poison center/doctor. Specific treatment (see on this label). Take off immediately all contaminated clothing and wash it before reuse. Absorb spillage to prevent material damage. Store locked up. Store in corrosive resistant container with a resistant inner liner. 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**

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- · Department issuing SDS: Environment protection department.
- · Contact: *High-Purity Standards* Tel: 843-767-7900 Fax: 843-767-7906 · Date of preparation / last revision 08/23/2019 / -· 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) VOC: Volatile Organic Compounds (USA, EU) 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 (Contd. on page 12)

Printing date 08/23/2019

Reviewed on 08/23/2019

*Trade name: Niobium 1000 µg/mL in 2% HNO3 + 0.5% HF* 

(Contd. of page 11)

REL: Recommended Exposure Limit BEI: Biological Exposure Limit Met. Corr. 1: Corrosive to metals – Category 1 Acute Tox. 3: Acute toxicity – Category 3 Skin Corr. 1A: Skin corrosion/irritation – Category 1A Eye Dam. 1: Serious eye damage/eye irritation – Category 1



Printing date 07/02/2019

**GH-P** 

Reviewed on 07/02/2019

#### **1** Identification

- · Product identifier
- Trade name: <u>Tantalum</u>
- · Article number: 100055-3

Details of the supplier of the safety data sheet
Manufacturer/Supplier: High-Purity Standards
Address PO Box 41727 Charleston, SC 29423 United States
Telephone +1-843-767-7900
Fax +1-843-767-7906
Website highpuritystandards.com
Email info@highpuritystandards.com

 Information department: Product safety department
 Emergency telephone number: INFOTRAC
 Emergency telephone numbers1-800-535-5053
 Other emergency telephone numbers 1-352-323-3500

### 2 Hazard(s) identification

· Classification of the substance or mixture



GHS06 Skull and crossbones

Acute Tox. 3 H311 Toxic in contact with skin.



Met. Corr.1H290May be corrosive to metals.Skin Corr. 1AH314Causes severe skin burns and eye damage.Eye Dam. 1H318Causes serious eye damage.

· Label elements

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



· Signal word Danger

Hazard-determining components of labeling: nitric acid
Hydrofluoric acid
Hazard statements
H290 May be corrosive to metals.
H311 Toxic in contact with skin.

(Contd. on page 2)

Printing date 07/02/2019

**3H-PURI** 

Reviewed on 07/02/2019

#### Trade name: Tantalum

(Contd. of page 1) H314 Causes severe skin burns and eye damage. · Precautionary statements Keep only in original container. Do not breathe dusts or mists. Wash thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection. If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. *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. Immediately call a poison center/doctor. Specific treatment (see on this label). Take off immediately all contaminated clothing and wash it before reuse. Absorb spillage to prevent material damage. Store locked up. Store in corrosive resistant container with a resistant inner liner. Dispose of contents/container in accordance with local/regional/national/international regulations. · Classification system: · NFPA ratings (scale 0 - 4) *Health* = 3Fire = 0Reactivity = 0· HMIS-ratings (scale 0 - 4) HEALTH 3 Health = 3FIRE 0 Fire = 0**REACTIVITY O** 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:** Mixture of the substances listed below with nonhazardous additions.

· Dangerous components:	
7697-37-2 nitric acid	2.0%
· Chemical identification of the substance/preparation	
7664-39-3 Hydrofluoric acid	0.5%
7440-25-7 tantalum	0.1%
7732-18-5 water, distilled, conductivity or of similar purity	97.4%
	LIE

(Contd. on page 3)

Printing date 07/02/2019

Reviewed on 07/02/2019

Trade name: Tantalum

(Contd. of page 2)

#### 4 First-aid measures

· Description of first aid measures

· General information:

Immediately remove any clothing soiled by the product.

- In case of irregular breathing or respiratory arrest provide artificial respiration.
- After inhalation: In case of unconsciousness place patient stably in side position for transportation.
- After skin contact: Immediately wash with water and soap and rinse thoroughly.
- After eye contact: Rinse opened eye for several minutes under running water. Then consult a doctor.
- After swallowing: Drink copious amounts of water and provide fresh air. Immediately call a doctor.
- 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
- During heating or in case of fire poisonous gases are produced.
- Advice for firefighters
- · Protective equipment: Mouth respiratory protective device.

# 6 Accidental release measures

• Personal precautions, protective equipment and emergency procedures Mount respiratory protective device.

Wear protective equipment. Keep unprotected persons away.

- Environmental precautions: Do not allow to enter sewers/ surface or ground water.
- Methods and material for containment and cleaning up:

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

*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.
- · Protective Action Criteria for Chemicals

· PAC-1:	
7697-37-2 nitric acid	0.16 ppm
7664-39-3 Hydrofluoric acid	1.0 ppm
7440-25-7 tantalum	10 mg/m <sup>3</sup>
• PAC-2:	
7697-37-2 nitric acid	24 ppm
7664-39-3 Hydrofluoric acid	24 ppm
· · ·	(Contd. on page 4)

# IIGH-PURITY Standards

# Safety Data Sheet acc. to OSHA HCS

Printing date 07/02/2019

Reviewed on 07/02/2019

Trade name: Tantalum

7440-25-7	tantalum	(Contd. of page 3) <i>I I mg/m<sup>3</sup></i>
• PAC-3:		
7697-37-2	nitric acid	92 ppm
7664-39-3	Hydrofluoric acid	44 ppm
7440-25-7	tantalum	64 mg/m <sup>3</sup>

# 7 Handling and storage

· Handling:

• **Precautions for safe handling** Ensure good ventilation/exhaustion at the workplace. Prevent formation of aerosols.

• 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: No special requirements.
- · Information about storage in one common storage facility: Not required.
- 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:

# 7697-37-2 nitric acid

- PEL Long-term value: 5 mg/m<sup>3</sup>, 2 ppm
- *REL* Short-term value: 10 mg/m<sup>3</sup>, 4 ppm
- Long-term value: 5 mg/m<sup>3</sup>, 2 ppm
- *TLV* Short-term value: 10 mg/m<sup>3</sup>, 4 ppm Long-term value: 5.2 mg/m<sup>3</sup>, 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 eyes.

Avoid contact with the eyes and skin.

• Breathing equipment:

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

(Contd. on page 5)

<sup>-</sup> US

Printing date 07/02/2019

Reviewed on 07/02/2019

#### Trade name: Tantalum

(Contd. of page 4)

· Protection of hands:



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation · *Material of gloves* 

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

· 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

Information on basic physical and General Information	chemical properties	
Appearance:		
Form:	Liquid	
Color:	colorless	
Odor:	Characteristic	
Odor threshold:	Not determined.	
pH-value:	Not determined.	
Change in condition		
Melting point/Melting range:	Undetermined.	
Boiling point/Boiling range:	100 °C (212 °F)	
Flash point:	Not applicable.	
Flammability (solid, gaseous):	Not applicable.	
Decomposition temperature:	Not determined.	
Auto igniting:	Product is not selfigniting.	
Danger of explosion:	Product does not present an explosion hazard.	
Explosion limits:		
Lower:	Not determined.	
Upper:	Not determined.	

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Reviewed on 07/02/2019

Trade name: Tantalum

	(Contd. of )	page
Vapor pressure at 20 °C (68 °F):	23 hPa (17.3 mm Hg)	
Density at 20 °C (68 °F):	1.02067 g/cm³ (8.51749 lbs/gal)	
Bulk density:	1,021 kg/m <sup>3</sup>	
Relative density	Not determined.	
Vapor density	Not determined.	
Evaporation rate	Not determined.	
Solubility in / Miscibility with		
Water:	Not miscible or difficult to mix.	
Partition coefficient (n-octanol/wate	er): Not determined.	
Viscosity:		
Dynamic:	Not determined.	
Kinematic:	Not determined.	
Solvent content:		
Water:	97.4 %	
VOC content:	0.00 %	
	0.0 g/l / 0.00 lb/gal	
Solids content:	0.1 %	
Other information	No further relevant information available.	

# **10 Stability and reactivity**

- · Reactivity No further relevant information available.
- · Chemical stability
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- · Possibility of hazardous reactions No dangerous reactions known.
- · Conditions to avoid No further relevant information available.
- · Incompatible materials: No further relevant information available.
- · Hazardous decomposition products: No dangerous decomposition products known.

# **11 Toxicological information**

- · Information on toxicological effects
- Acute toxicity:

· LD/LC50 values that are relevant for classification:

7664-39-3 Hydrofluoric acid

Oral LD50 1,276 mg/kg (rat)

- · Primary irritant effect:
- on the skin: Strong caustic effect on skin and mucous membranes.
- on the eye:
- Strong caustic effect.
- Strong irritant with the danger of severe eye injury.
- Sensitization: No sensitizing effects known.

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US

(Contd. of page 6)

# Safety Data Sheet acc. to OSHA HCS

Printing date 07/02/2019

Reviewed on 07/02/2019

#### Trade name: Tantalum

· Additional toxicological information:

The product shows the following dangers according to internally approved calculation methods for preparations: Toxic

Corrosive

Irritant

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

· Carcinogenic categories

· IARC (International Agency for Research on Cancer)

None of the ingredients is listed.

· 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: 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:

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:* Disposal must be made according to official regulations.

(Contd. on page 8)



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Reviewed on 07/02/2019

Trade name: Tantalum

	(Contd. of page
Transport information	
UN-Number DOT, ADR, IMDG, IATA	UN2922
UN proper shipping name DOT ADR IMDG, IATA	Corrosive liquids, toxic, n.o.s. (Nitric acid, Hydrogen fluoride) 2922 Corrosive liquids, toxic, n.o.s. (Nitric acid, Hydrogen fluoride CORROSIVE LIQUID, TOXIC, N.O.S. (NITRIC ACID, HYDROGE FLUORIDE)
Transport hazard class(es)	
DOT	
CORROSIVE 8 6	
Class Label	8 Corrosive substances 8, 6.1
ADR	
Class	8 Corrosive substances
Label	8+6.1
IMDG	
Class	8 Corrosive substances
Label	8/6.1
IATA	
Class Label	8 Corrosive substances 8 (6.1)
Packing group DOT, ADR, IMDG, IATA	III
Environmental hazards:	Not applicable.
Special precautions for user Danger code (Kemler): EMS Number:	Warning: Corrosive substances 86 F-A,S-B
	(Contd. on page

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Trade name: Tantalum

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	(Contd. of page
Segregation groups	Acids
Stowage Category	В
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:	
DOT	
Quantity limitations	On passenger aircraft/rail: 5 L
	On cargo aircraft only: 60 L
ADR	
Excepted quantities (EQ)	Code: E1
· · · · · ·	Maximum net quantity per inner packaging: 30 ml
	Maximum net quantity per outer packaging: 1000 ml
·IMDG	
Limited quantities (LQ)	5L
Excepted quantities (EQ)	Code: El
	Maximum net quantity per inner packaging: 30 ml
	Maximum net quantity per outer packaging: 1000 ml
UN "Model Regulation":	UN 2922 CORROSIVE LIQUIDS, TOXIC, N.O.S. (NITRIC ACII
2	HYDROGEN FLUORIDE), 8 (6.1), III

# **15 Regulatory information**

 $\cdot$  Safety, health and environmental regulations/legislation specific for the substance or mixture  $\cdot$  Sara

Section 355 (extremely hazardous substances):	
7697-37-2 nitric acid	
7664-39-3 Hydrofluoric acid	
Section 313 (Specific toxic chemical listings):	
7697-37-2 nitric acid	
7664-39-3 Hydrofluoric acid	
TSCA (Toxic Substances Control Act):	
All ingredients are listed.	
Proposition 65	
Chemicals known to cause cancer:	
None of the ingredients is listed.	
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.	
	(Contd. on pag

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Trade name: Tantalum

(Contd. of page 9)

Chemicals known to cause developmental toxicity:

None of the ingredients is listed.

· Carcinogenic categories

· EPA (Environmental Protection Agency) (Substances not listed)

7697-37-2 nitric acid

7664-39-3 Hydrofluoric acid

7440-25-7 tantalum

7732-18-5 water, distilled, conductivity or of similar purity

• TLV (Threshold Limit Value established by ACGIH)

None of the ingredients is listed.

·NIOSH-Ca (National Institute for Occupational Safety and Health)

None of the ingredients is listed.

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



· Signal word Danger

· Hazard-determining components of labeling: nitric acid Hydrofluoric acid · Hazard statements H290 May be corrosive to metals. H311 Toxic in contact with skin. H314 Causes severe skin burns and eye damage. · Precautionary statements Keep only in original container. Do not breathe dusts or mists. Wash thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection. If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. 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. Immediately call a poison center/doctor. Specific treatment (see on this label). Take off immediately all contaminated clothing and wash it before reuse. Absorb spillage to prevent material damage. Store locked up. Store in corrosive resistant container with a resistant inner liner. Dispose of contents/container in accordance with local/regional/national/international regulations. (Contd. on page 11)



Printing date 07/02/2019

**GH-PURI** 

(Contd. of page 10)

#### Trade name: Tantalum

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

# 16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· Department issuing SDS: Environment protection department.

#### · Contact: High-Purity Standards Tel: 843-767-7900 Fax: 843-767-7906 · Date of preparation / last revision 07/02/2019 / -· 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) VOC: Volatile Organic Compounds (USA, EU) 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 Met. Corr.1: Corrosive to metals - Category 1 Acute Tox. 3: Acute toxicity – Category 3 Skin Corr. 1A: Skin corrosion/irritation – Category 1A Eye Dam. 1: Serious eye damage/eye irritation – Category 1

HIGH-PURITY STANDARDS Safety Data Sheet acc. to OSHA HCS

Printing date 11/20/2018

Reviewed on 11/20/2018

	tifier			
Trade name:	Tellurium 10	000µg/mL in 2% HNO3 + 0.5%	HF	
Article numb	er: 100056-3			
Manufacture High-Purity P.O. Box 417 Charleston, S	<b>er/Supplier:</b> Standards 227 SC 29423 843) 767-7900	he safety data sheet )		
Information Emergency t INFOTRAC		Product safety department aber:		
Emergency te		bers1-800-535-5053 e numbers 1-352-323-3500		
Classification	<mark>identifications and an internation of the substa</mark> tion of the substation of the subs	ince or mixture		
Classification	n of the subst	ince or mixture		
Classification Gl Acute Tox. 3	n of the subst	<b>ince or mixture</b> d crossbones Toxic in contact with skin.		
Classification Gl Acute Tox. 3	n of the substa HS06 Skull an H311 HS08 Health k	<b>ince or mixture</b> d crossbones Toxic in contact with skin.	orn child. May cause	e harm to breast-fed children.
Classification Gl Acute Tox. 3 Acute Tox. 3 Repr. 1A	n of the substa HS06 Skull an H311 HS08 Health k	ance or mixture d crossbones Toxic in contact with skin. azard May damage fertility or the un	born child. May cause	e harm to breast-fed children.
Classification Gl Acute Tox. 3 Acute Tox. 3 Repr. 1A	n of the substa HS06 Skull an H311 HS08 Health k H360-H362	ance or mixture d crossbones Toxic in contact with skin. azard May damage fertility or the un	born child. May cause	e harm to breast-fed children.
Classification GI Acute Tox. 3 Acute Tox. 3 GI Repr. 1A	n of the subst HS06 Skull and H311 HS08 Health R H360-H362 HS05 Corrosid H290 H314	ance or mixture d crossbones Toxic in contact with skin. azard May damage fertility or the un on		e harm to breast-fed children.
Classification Gl Acute Tox. 3 Acute Tox. 3 Corr. 1A Met. Corr. 1	n of the substa HS06 Skull an H311 HS08 Health h H360-H362 HS05 Corrosia H290	ance or mixture d crossbones Toxic in contact with skin. azard May damage fertility or the un m May be corrosive to metals.		e harm to breast-fed children.

· Signal word Danger

· Hazard-determining components of labeling: nitric acid

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# HIGH-PURITY STANDARDS

# Safety Data Sheet acc. to OSHA HCS

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Trade name: Tellurium 1000µg/mL in 2% HNO3 + 0.5% HF

	(Contd. of page 1)
Hydrofluoric acid	
tellurium • <b>Hazard statements</b>	
H290 May be corrosive to metals.	
H311 Toxic in contact with skin.	
H314 Causes severe skin burns and eye damage.	
H360-H362 May damage fertility or the unborn child. May cause harm to breast-fed children.	
· Precautionary statements	
Obtain special instructions before use.	
Do not handle until all safety precautions have been read and understood.	
Keep only in original container.	
Do not breathe dusts or mists.	
Avoid contact during pregnancy/while nursing.	
Wash thoroughly after handling.	
Do not eat, drink or smoke when using this product.	
Wear protective gloves/protective clothing/eye protection/face protection.	
If swallowed: Rinse mouth. Do NOT induce vomiting.	
If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/showe	r.
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 presen	t and easy to do.
Continue rinsing.	
Immediately call a poison center/doctor.	
IF exposed or concerned: Get medical advice/attention.	
Specific treatment (see on this label).	
Take off immediately all contaminated clothing and wash it before reuse.	
Absorb spillage to prevent material damage.	
Store locked up.	
Store in corrosive resistant container with a resistant inner liner.	
Dispose of contents/container in accordance with local/regional/national/international regulatio	ns.
· Classification system:	
· NFPA ratings (scale 0 - 4)	
Health = 3	
Fire = $0$	
$\begin{array}{c} 3 \\ \hline 0 \\ \hline Reactivity = 0 \end{array}$	
▼ ▼	
· HMIS-ratings (scale 0 - 4)	
HEALTH 3 $Health = 3$	
FIRE 0 Fire = 0 <b>REACTIVITY</b> 0 Reactivity = 0	
<b>REACTIVITY</b> $0$ Reactivity = 0	
· Other hazards	
· Results of PBT and vPvB assessment	
• <b>PBT:</b> Not applicable.	
• <b>vPvB:</b> Not applicable.	
3 Composition/information on ingredients	
· Chemical characterization: Mixtures	

• Description: Mixture of the substances listed below with nonhazardous additions.

(Contd. on page 3)

Printing date 11/20/2018

Reviewed on 11/20/2018

Trade name: Tellurium 1000µg/mL in 2% HNO3 + 0.5% HF

		(Contd. of page 2)
U U	components:	
7697-37-2	nitric acid	2.0%
13494-80-9	tellurium	0.1%
· Chemical ia	lentification of the substance/preparation	
7664-39-3	Hydrofluoric acid	0.5%
7732-18-5	water, distilled, conductivity or of similar purity	97.4%

# 4 First-aid measures

· Description of first aid measures

· General information:

Immediately remove any clothing soiled by the product.

- In case of irregular breathing or respiratory arrest provide artificial respiration.
- After inhalation: In case of unconsciousness place patient stably in side position for transportation.
- After skin contact: Immediately wash with water and soap and rinse thoroughly.
- After eye contact: Rinse opened eye for several minutes under running water. Then consult a doctor.
- After swallowing: Drink copious amounts of water and provide fresh air. Immediately call a doctor.
- 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
- During heating or in case of fire poisonous gases are produced.
- Advice for firefighters
- · Protective equipment: Mouth respiratory protective device.

# 6 Accidental release measures

· Personal precautions, protective equipment and emergency procedures

Mount respiratory protective device.

- Wear protective equipment. Keep unprotected persons away.
- Environmental precautions: Do not allow to enter sewers/ surface or ground water.
- Methods and material for containment and cleaning up:

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). 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.

(Contd. on page 4)



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Printing date 11/20/2018

Reviewed on 11/20/2018

Trade name: Tellurium 1000µg/mL in 2% HNO3 + 0.5% HF

(Contd. of page 3)

• Protective A	Action Criteria for Chemicals	(conta. of page 3)
· PAC-1:		
7697-37-2	nitric acid	0.16 ppm
7664-39-3	Hydrofluoric acid	1.0 ppm
13494-80-9	tellurium	1.8 mg/m <sup>3</sup>
· PAC-2:		
7697-37-2	nitric acid	24 ppm
7664-39-3	Hydrofluoric acid	24 ppm
13494-80-9	tellurium	20 mg/m <sup>3</sup>
· PAC-3:		
7697-37-2	nitric acid	92 ppm
7664-39-3	Hydrofluoric acid	44 ppm
13494-80-9	tellurium	110 mg/m <sup>3</sup>

# 7 Handling and storage

· Handling:

- Precautions for safe handling
- Ensure good ventilation/exhaustion at the workplace. Open and handle receptacle with care. Prevent formation of aerosols.

· 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: No special requirements.
- · Information about storage in one common storage facility: Not required.
- 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:

## 7697-37-2 nitric acid

PEL Long-term value: 5 mg/m<sup>3</sup>, 2 ppm

- REL Short-term value: 10 mg/m<sup>3</sup>, 4 ppm Long-term value: 5 mg/m<sup>3</sup>, 2 ppm
- TLV Short-term value: 10 mg/m<sup>3</sup>, 4 ppm Long-term value: 5.2 mg/m<sup>3</sup>, 2 ppm

(Contd. on page 5)

HIGH-PURITY STANDARDS

# Safety Data Sheet acc. to OSHA HCS

Printing date 11/20/2018

Reviewed on 11/20/2018

Trade name: Tellurium 1000µg/mL in 2% HNO3 + 0.5% HF

(Contd. of page 4) 13494-80-9 tellurium PEL Long-term value: 0.1 mg/m<sup>3</sup> as Te REL Long-term value: 0.1 mg/m<sup>3</sup> as Te TLV Long-term value: 0.1 mg/m<sup>3</sup> as Te • 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 eyes. Avoid contact with the eyes and skin. • Breathing equipment: In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air. · Protection of hands: Protective gloves *The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.* Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture. Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation · Material of gloves The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application. · 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

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Reviewed on 11/20/2018

## Trade name: Tellurium 1000µg/mL in 2% HNO3 + 0.5% HF

H-PURITY

(Contd. of page 5)

Information on basic physical and c	hemical properties
General Information	nemeu properues
Appearance:	
Form:	Liquid
Color:	Colorless
Odor:	Characteristic
Odor threshold:	Not determined.
pH-value:	Not determined.
Change in condition	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	100 °C (212 °F)
Flash point:	Not applicable.
Flammability (solid, gaseous):	Not applicable.
Decomposition temperature:	Not determined.
Auto igniting:	Product is not selfigniting.
Danger of explosion:	Product does not present an explosion hazard.
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):	1.01032 g/cm <sup>3</sup> (8.43112 lbs/gal)
Bulk density:	1,010 kg/m <sup>3</sup>
Relative density	Not determined.
Vapor density	Not determined.
Evaporation rate	Not determined.
Solubility in / Miscibility with	
Water:	Not miscible or difficult to mix.
Partition coefficient (n-octanol/wate	r): Not determined.
Viscosity:	
Dynamic:	Not determined.
Kinematic:	Not determined.
Solvent content:	
Water:	97.4 %
VOC content:	0.00 %
	0.0 g/l / 0.00 lb/gal
Solids content:	0.1 %
Other information	No further relevant information available.

(Contd. on page 7)

US

Printing date 11/20/2018

Reviewed on 11/20/2018

Trade name: Tellurium 1000µg/mL in 2% HNO3 + 0.5% HF

(Contd. of page 6)

#### **10 Stability and reactivity**

- · Reactivity No further relevant information available.
- · Chemical stability
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- · Possibility of hazardous reactions No dangerous reactions known.
- · Conditions to avoid No further relevant information available.
- · Incompatible materials: No further relevant information available.
- · Hazardous decomposition products: No dangerous decomposition products known.

# **11 Toxicological information**

· Information on toxicological effects

• Acute toxicity:

· LD/LC50 values that are relevant for classification:

7664-39-3 Hydrofluoric acid

*Oral LD50 1,276 mg/kg (rat)* 

13494-80-9 tellurium

Oral LD50 83 mg/kg (rat)

- · Primary irritant effect:
- on the skin: Strong caustic effect on skin and mucous membranes.
- on the eye:
- Strong caustic effect.

Strong irritant with the danger of severe eye injury.

- Sensitization: No sensitizing effects known.
- · Additional toxicological information:
- *The product shows the following dangers according to internally approved calculation methods for preparations: Toxic*
- Corrosive
- Irritant

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

- · Carcinogenic categories
- · IARC (International Agency for Research on Cancer)

None of the ingredients is listed.

· 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**

- Aquatic toxicity: No further relevant information available.
- *Persistence and degradability* No further relevant information available.



<sup>·</sup> Toxicity

US

Printing date 11/20/2018

*Reviewed on 11/20/2018* 

Trade name: Tellurium 1000µg/mL in 2% HNO3 + 0.5% HF

(Contd. of page 7)

- · 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:* Disposal must be made according to official regulations.

· UN-Number · DOT, ADR, IMDG, IATA	UN2922
· UN proper shipping name · DOT · ADR · IMDG, IATA	Corrosive liquids, toxic, n.o.s. (Nitric acid, Hydrogen fluoride) 2922 Corrosive liquids, toxic, n.o.s. (Nitric acid, Hydrogen fluoride CORROSIVE LIQUID, TOXIC, N.O.S. (NITRIC ACID, HYDROGE FLUORIDE)
Transport hazard class(es) DOT	
· Class · Label	8 Corrosive substances 8, 6.1
ADR	



Printing date 11/20/2018

*Reviewed on 11/20/2018* 

Trade name: Tellurium 1000µg/mL in 2% HNO3 + 0.5% HF

	(Contd. of pag
Label	8+6.1
IMDG	
Class	8 Corrosive substances
Label	8/6.1
IATA	
Class	8 Corrosive substances
Label	8 (6.1)
Packing group DOT, ADR, IMDG, IATA	111
Environmental hazards:	Not applicable.
Special precautions for user	Warning: Corrosive substances
Danger code (Kemler):	86
EMS Number:	F- $A$ , $S$ - $B$
Segregation groups	Acids
Stowage Category	В
Stowage Code	SW2 Clear of living quarters.
Transport in bulk according to Annex MARPOL73/78 and the IBC Code	: <b>II of</b> Not applicable.
Transport/Additional information:	
DOT	
Quantity limitations	On passenger aircraft/rail: 5 L
	On cargo aircraft only: 60 L
ADR	
Excepted quantities (EQ)	Code: El
	Maximum net quantity per inner packaging: 30 ml
	Maximum net quantity per outer packaging: 1000 ml
IMDG	
Limited quantities (LQ)	5L
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 2922 CORROSIVE LIQUIDS, TOXIC, N.O.S. (NITRIC ACI HYDROGEN FLUORIDE), 8 (6.1), III

(Contd. on page 10)

*Printing date 11/20/2018* 

Reviewed on 11/20/2018

Trade name: Tellurium 1000µg/mL in 2% HNO3 + 0.5% HF

(Contd. of page 9)

### **15 Regulatory information**

HIGH-PURITY

 $\cdot$  Safety, health and environmental regulations/legislation specific for the substance or mixture  $\cdot$  Sara

• Section 355 (extremely hazardous substances):

7697-37-2 nitric acid

7664-39-3 Hydrofluoric acid

13494-80-9 tellurium

· Section 313 (Specific toxic chemical listings):

7697-37-2 nitric acid

7664-39-3 Hydrofluoric acid

• TSCA (Toxic Substances Control Act):

All ingredients are listed.

· Proposition 65

· Chemicals known to cause cancer:

None of the ingredients is listed.

· 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) (Substances not listed)

7697-37-2 nitric acid

7664-39-3 Hydrofluoric acid

13494-80-9 tellurium

7732-18-5 water, distilled, conductivity or of similar purity

• TLV (Threshold Limit Value established by ACGIH)

None of the ingredients is listed.

· NIOSH-Ca (National Institute for Occupational Safety and Health)

None of the ingredients is listed.

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



· Signal word Danger

(Contd. on page 11)

HIGH-PURITY STANDARDS

# Safety Data Sheet acc. to OSHA HCS

Printing date 11/20/2018

Reviewed on 11/20/2018

Trade name: Tellurium 1000µg/mL in 2% HNO3 + 0.5% HF

(Contd. of page 10) · Hazard-determining components of labeling: nitric acid Hydrofluoric acid tellurium · Hazard statements H290 May be corrosive to metals. H311Toxic in contact with skin. H314 Causes severe skin burns and eye damage. H360-H362 May damage fertility or the unborn child. May cause harm to breast-fed children. · Precautionary statements Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep only in original container. Do not breathe dusts or mists. Avoid contact during pregnancy/while nursing. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective gloves/protective clothing/eye protection/face protection. If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. 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. *Immediately call a poison center/doctor. IF exposed or concerned: Get medical advice/attention.* Specific treatment (see on this label). Take off immediately all contaminated clothing and wash it before reuse. Absorb spillage to prevent material damage. Store locked up. Store in corrosive resistant container with a resistant inner liner. 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**

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· Department issuing SDS: Environment protection department.

· Contact:

*High-Purity Standards Tel:* 843-767-7900 *Fax:* 843-767-7906

· Date of preparation / last revision 11/20/2018 / -

· 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

(Contd. on page 12)

US

Safety Data Sheet acc. to OSHA HCS

Printing date 11/20/2018

Reviewed on 11/20/2018

Trade name: Tellurium 1000µg/mL in 2% HNO3 + 0.5% HF

(Contd. of page 11) 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) VOC: Volatile Organic Compounds (USA, EU) 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 Met. Corr.1: Corrosive to metals - Category 1 Acute Tox. 3: Acute toxicity – Category 3 Skin Corr. 1A: Skin corrosion/irritation - Category 1A Eye Dam. 1: Serious eye damage/eye irritation – Category 1 Repr. 1A: Reproductive toxicity - Category 1A



Printing date 03/15/2019

**SH-PUF** 

Reviewed on 03/15/2019

**1 Identification** · Product identifier • Trade name: Tin (1000µg/mL in 2% HNO3 + 0.5% HF) · Article number: 100061-3 • Details of the supplier of the safety data sheet · Manufacturer/Supplier: *High-Purity Standards* P.O. Box 41727 Charleston, SC 29423 Telephone: (843) 767-7900 FAX: (843) 767-7906 · Information department: Product safety department • Emergency telephone number: INFOTRAC Emergency telephone numbers 1-800-535-5053 Other emergency telephone numbers 1-352-323-3500 2 Hazard(s) identification · Classification of the substance or mixture GHS06 Skull and crossbones

Acute Tox. 3 H311 Toxic in contact with skin.



Met. Corr.1H290May be corrosive to metals.Skin Corr. 1AH314Causes severe skin burns and eye damage.Eye Dam. 1H318Causes serious eye damage.

· Label elements

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



· Signal word Danger

Hazard-determining components of labeling: nitric acid
Hydrofluoric acid
Hazard statements
H290 May be corrosive to metals.
H311 Toxic in contact with skin.
H314 Causes severe skin burns and eye damage.

(Contd. on page 2)

Printing date 03/15/2019

Reviewed on 03/15/2019

# *Trade name: Tin (1000µg/mL in 2% HNO3 + 0.5% HF)*

H-PURITY

(Contd. of page 1)

	(Contd. of page 1)
· Precautionary statements	
Keep only in original container.	
Do not breathe dusts or mists.	
Wash thoroughly after handling.	
Wear protective gloves/protective clothing/eye protection/face protection.	
If swallowed: Rinse mouth. Do NOT induce vomiting.	
If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower	r.
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 presen	t and easv to do.
Continue rinsing.	2
Immediately call a poison center/doctor.	
Specific treatment (see on this label).	
Take off immediately all contaminated clothing and wash it before reuse.	
Absorb spillage to prevent material damage.	
Store locked up.	
Store in corrosive resistant container with a resistant inner liner.	
Dispose of contents/container in accordance with local/regional/national/international regulation	ns
· Classification system:	15.
· NFPA ratings (scale 0 - 4)	
Fire = 0 Reactivity = 0 • HMIS-ratings (scale 0 - 4) HEALTH 3 Health = 3 FIRE 0 Fire = 0 REACTIVITY 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	
• <b>Description:</b> Mixture of the substances listed below with nonhazardous additions.	
· Dangerous components:	
7697-37-2 nitric acid	2.0%
· · · · · · · · · · · · · · · · · · ·	

· Chemical identification of the substance/preparation			
7664-39-3	Hydrofluoric acid	0.5%	
7440-31-5	tin	0.1%	
7732-18-5	water, distilled, conductivity or of similar purity	97.4%	

(Contd. on page 3)

Printing date 03/15/2019

Reviewed on 03/15/2019

Trade name: Tin (1000µg/mL in 2% HNO3 + 0.5% HF)

(Contd. of page 2)

#### 4 First-aid measures

· Description of first aid measures

· General information:

Immediately remove any clothing soiled by the product.

- In case of irregular breathing or respiratory arrest provide artificial respiration.
- After inhalation: In case of unconsciousness place patient stably in side position for transportation.
- After skin contact: Immediately wash with water and soap and rinse thoroughly.
- After eye contact: Rinse opened eye for several minutes under running water. Then consult a doctor.
- After swallowing: Drink copious amounts of water and provide fresh air. Immediately call a doctor.
- 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
- During heating or in case of fire poisonous gases are produced.
- Advice for firefighters
- · Protective equipment: Mouth respiratory protective device.

# 6 Accidental release measures

• Personal precautions, protective equipment and emergency procedures Mount respiratory protective device.

Wear protective equipment. Keep unprotected persons away.

- Environmental precautions: Do not allow to enter sewers/ surface or ground water.
- Methods and material for containment and cleaning up:

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). 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.
- Protective Action Criteria for Chemicals

· PAC-1:		
1697-37-2 v		0.16 ppm
7664-39-3	Hydrofluoric acid	1.0 ppm
7440-31-5 t	tin	6 mg/m <sup>3</sup>
· PAC-2:		
7697-37-2 I		24 ppm
7664-39-3	Hydrofluoric acid	24 ppm
· · · ·		Contd. on page 4)

# HIGH-PURITY STANDARDS

#### Safety Data Sheet acc. to OSHA HCS

Printing date 03/15/2019

Reviewed on 03/15/2019

#### *Trade name: Tin (1000µg/mL in 2% HNO3 + 0.5% HF)*

7440-31-5	tin	(Contd. of page 3) 67 mg/m <sup>3</sup>
• PAC-3:		
	nitric acid	92 ppm
	Hydrofluoric acid	44 ppm
7440-31-5	tin	400 mg/m <sup>3</sup>

#### 7 Handling and storage

· Handling:

• **Precautions for safe handling** Ensure good ventilation/exhaustion at the workplace. Prevent formation of aerosols.

• 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: No special requirements.
- · Information about storage in one common storage facility: Not required.
- · 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:

#### 7697-37-2 nitric acid

- PEL Long-term value: 5 mg/m<sup>3</sup>, 2 ppm
- *REL* Short-term value: 10 mg/m<sup>3</sup>, 4 ppm
- Long-term value: 5 mg/m<sup>3</sup>, 2 ppm
- TLV Short-term value: 10 mg/m<sup>3</sup>, 4 ppm Long-term value: 5.2 mg/m<sup>3</sup>, 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 eyes. Avoid contact with the eyes and skin.

Avoia contact with the eyes and

• Breathing equipment:

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

(Contd. on page 5)

<sup>-</sup> US

*Printing date 03/15/2019* 

Trade name: Tin (1000µg/mL in 2% HNO3 + 0.5% HF)

(Contd. of page 4) · Protection of hands: Protective gloves The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture. Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation · Material of gloves The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application. · 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 · General Information		
· Appearance:		
Form:	Liquid	
Color:	Colorless	
· Odor:	Characteristic	
· Odor threshold:	Not determined.	
pH-value:	Not determined.	
· Change in condition		
Melting point/Melting range:	Undetermined.	
Boiling point/Boiling range:	100 °C (212 °F)	
· Flash point:	Not applicable.	
· Flammability (solid, gaseous):	Not applicable.	
• Decomposition temperature:	Not determined.	
· Auto igniting:	Product is not selfigniting.	
Danger of explosion:	Product does not present an explosion hazard.	
· Explosion limits:		
Lower:	Not determined.	
Upper:	Not determined.	
	(Contd.	on page



Printing date 03/15/2019

HIGH-PURITY

Reviewed on 03/15/2019

#### Trade name: Tin (1000µg/mL in 2% HNO3 + 0.5% HF)

		(Contd. of page
· Vapor pressure at 20 °C (68 °F):	23 hPa (17.3 mm Hg)	
· Density at 20 °C (68 °F):	1.00757 g/cm³ (8.40817 lbs/gal)	
Bulk density:	1,008 kg/m <sup>3</sup>	
· Relative density	Not determined.	
· Vapor density	Not determined.	
· Evaporation rate	Not determined.	
· Solubility in / Miscibility with		
Water:	Not miscible or difficult to mix.	
Partition coefficient (n-octanol/wate	er): Not determined.	
· Viscosity:		
Dynamic:	Not determined.	
Kinematic:	Not determined.	
Solvent content:		
Water:	97.4 %	
VOC content:	0.00 %	
	0.0 g/l / 0.00 lb/gal	
Solids content:	0.1 %	
• Other information	No further relevant information available.	

#### **10 Stability and reactivity**

- · Reactivity No further relevant information available.
- · Chemical stability
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- · Possibility of hazardous reactions No dangerous reactions known.
- · Conditions to avoid No further relevant information available.
- · Incompatible materials: No further relevant information available.
- · Hazardous decomposition products: No dangerous decomposition products known.

#### **11 Toxicological information**

- · Information on toxicological effects
- Acute toxicity:
- · LD/LC50 values that are relevant for classification:

7664-39-3 Hydrofluoric acid

*Oral LD50 1,276 mg/kg (rat)* 

- · Primary irritant effect:
- on the skin: Strong caustic effect on skin and mucous membranes.
- on the eye:
- Strong caustic effect.
- Strong irritant with the danger of severe eye injury.
- Sensitization: No sensitizing effects known.

(Contd. on page 7)

US

*Printing date 03/15/2019* 

Reviewed on 03/15/2019

#### Trade name: Tin (1000µg/mL in 2% HNO3 + 0.5% HF)

(Contd. of page 6)

• Additional toxicological information:

*The product shows the following dangers according to internally approved calculation methods for preparations: Toxic* 

Corrosive

Irritant

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

• Carcinogenic categories

· IARC (International Agency for Research on Cancer)

None of the ingredients is listed.

· 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: 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:

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: Disposal must be made according to official regulations.

(Contd. on page 8)

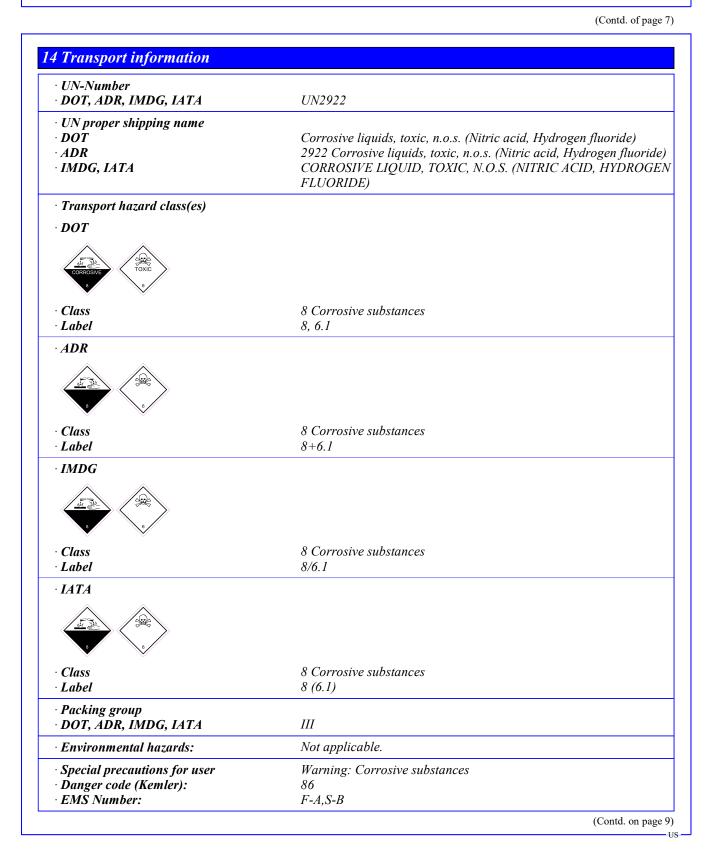




*Printing date 03/15/2019* 

Reviewed on 03/15/2019

*Trade name: Tin (1000µg/mL in 2% HNO3 + 0.5% HF)* 



Printing date 03/15/2019

Reviewed on 03/15/2019

*Trade name: Tin (1000µg/mL in 2% HNO3 + 0.5% HF)* 

	(Contd. of page
Segregation groups	Acids
Stowage Category	В
Stowage Code	SW2 Clear of living quarters.
Transport in bulk according to Anne	x II of
MARPOL73/78 and the IBC Code	Not applicable.
Transport/Additional information:	
DOT	
Quantity limitations	On passenger aircraft/rail: 5 L
	On cargo aircraft only: 60 L
ADR	
Excepted quantities (EQ)	Code: El
	Maximum net quantity per inner packaging: 30 ml
	Maximum net quantity per outer packaging: 1000 ml
IMDG	
Limited quantities (LQ)	5L
Excepted quantities $(\widetilde{E}Q)$	Code: El
	Maximum net quantity per inner packaging: 30 ml
	Maximum net quantity per outer packaging: 1000 ml
UN "Model Regulation":	UN 2922 CORROSIVE LIQUIDS, TOXIC, N.O.S. (NITRIC ACIL HYDROGEN FLUORIDE), 8 (6.1), III

# **15 Regulatory information**

 $\cdot$  Safety, health and environmental regulations/legislation specific for the substance or mixture  $\cdot$  Sara

7697-37-2 nitric acid	
7664-39-3 Hydrofluoric acid	
Section 313 (Specific toxic chemical listings):	
7697-37-2 nitric acid	
7664-39-3 Hydrofluoric acid	
TSCA (Toxic Substances Control Act):	
All ingredients are listed.	
Proposition 65	
Chemicals known to cause cancer:	
None of the ingredients is listed.	
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.	
	(Contd. on page

Printing date 03/15/2019

IGH-PURI

Reviewed on 03/15/2019

Trade name: Tin (1000µg/mL in 2% HNO3 + 0.5% HF)

(Contd. of page 9)

Chemicals known to cause developmental toxicity:

None of the ingredients is listed.

· Carcinogenic categories

· EPA (Environmental Protection Agency) (Substances not listed)

7697-37-2 nitric acid

7664-39-3 Hydrofluoric acid

7440-31-5 tin

7732-18-5 water, distilled, conductivity or of similar purity

• TLV (Threshold Limit Value established by ACGIH)

None of the ingredients is listed.

·NIOSH-Ca (National Institute for Occupational Safety and Health)

None of the ingredients is listed.

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



· Signal word Danger

· Hazard-determining components of labeling: nitric acid Hydrofluoric acid · Hazard statements H290 May be corrosive to metals. H311 Toxic in contact with skin. H314 Causes severe skin burns and eye damage. · Precautionary statements Keep only in original container. Do not breathe dusts or mists. Wash thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection. If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. 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. Immediately call a poison center/doctor. Specific treatment (see on this label). Take off immediately all contaminated clothing and wash it before reuse. Absorb spillage to prevent material damage. Store locked up. Store in corrosive resistant container with a resistant inner liner. Dispose of contents/container in accordance with local/regional/national/international regulations. (Contd. on page 11)

*Printing date 03/15/2019* 

Reviewed on 03/15/2019

*Trade name: Tin (1000µg/mL in 2% HNO3 + 0.5% HF)* 

(Contd. of page 10)

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

# **16 Other information**

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· Department issuing SDS: Environment protection department.

#### · Contact: High-Purity Standards Tel: 843-767-7900 Fax: 843-767-7906 • Date of preparation / last revision 03/15/2019 / -· 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) VOC: Volatile Organic Compounds (USA, EU) 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 Met. Corr.1: Corrosive to metals – Category 1 Acute Tox. 3: Acute toxicity – Category 3 Skin Corr. 1A: Skin corrosion/irritation – Category 1A Eye Dam. 1: Serious eye damage/eye irritation – Category 1



Printing date 06/26/2019

GH-PURI

Reviewed on 06/26/2019

# **1 Identification**

- · Product identifier
- Trade name: 100062-3 Titanium (1000 µg/mL in 2% HNO3 + 0.1% HF)
- · Article number: 100062-3

Details of the supplier of the safety data sheet
Manufacturer/Supplier: High-Purity Standards
Address PO Box 41727 Charleston, SC 29423 United States
Telephone +1-843-767-7900
Fax +1-843-767-7906
Website highpuritystandards.com
Email info@highpuritystandards.com

 Information department: Product safety department
 Emergency telephone number: INFOTRAC
 Emergency telephone numbers1-800-535-5053
 Other emergency telephone numbers 1-352-323-3500

#### 2 Hazard(s) identification

· Classification of the substance or mixture

GHS05 Corrosion

Met. Corr.1H290 May be corrosive to metals.Skin Corr. 1AH314 Causes severe skin burns and eye damage.Eye Dam.1H318 Causes serious eye damage.

· Label elements

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



· Signal word Danger

Hazard-determining components of labeling: nitric acid
Hazard statements H290 May be corrosive to metals. H314 Causes severe skin burns and eye damage.
Precautionary statements Keep only in original container. Do not breathe dusts or mists. Wash thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection. If swallowed: Rinse mouth. Do NOT induce vomiting.

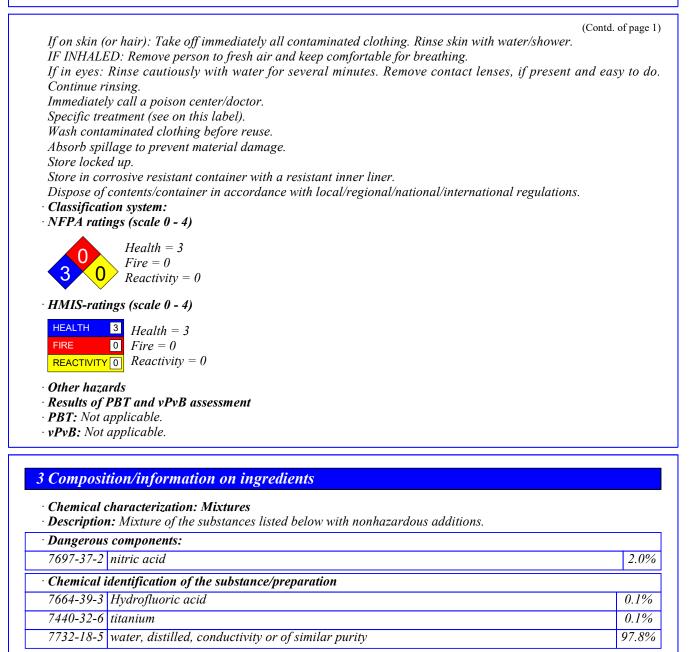
(Contd. on page 2)

US

*Printing date 06/26/2019* 

*Reviewed on 06/26/2019* 

Trade name: 100062-3 Titanium (1000 µg/mL in 2% HNO3 + 0.1% HF)



# 4 First-aid measures

· Description of first aid measures

· General information: Immediately remove any clothing soiled by the product.

• After inhalation: In case of unconsciousness place patient stably in side position for transportation.

• After skin contact: Immediately wash with water and soap and rinse thoroughly.

• After eye contact: Rinse opened eye for several minutes under running water. Then consult a doctor.

• After swallowing: Drink copious amounts of water and provide fresh air. Immediately call a doctor.

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Trade name: 100062-3 Titanium (1000 µg/mL in 2% HNO3 + 0.1% HF)

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- · 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

During heating or in case of fire poisonous gases are produced.

- · Advice for firefighters
- · Protective equipment: Mouth respiratory protective device.

#### 6 Accidental release measures

	recautions, protective equipment and emergency procedures	
	iratory protective device.	
	ctive equipment. Keep unprotected persons away.	
	ntal precautions: No special measures required.	
	nd material for containment and cleaning up:	
	h liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).	
	lizing agent.	
	ntaminated material as waste according to item 13.	
	quate ventilation.	
	to other sections	
	7 for information on safe handling.	
	8 for information on personal protection equipment.	
	13 for disposal information.	
· Protective .	Action Criteria for Chemicals	
• PAC-1:		
7697-37-2	nitric acid	0.16 ppn
7664-39-3	Hydrofluoric acid	1.0 ppm
7440-32-6	titanium	30 mg/m
· PAC-2:		
7697-37-2	nitric acid	24 ppm
7664-39-3	Hydrofluoric acid	24 ppm
7440-32-6	titanium	330 mg/m
· PAC-3:		
7697-37-2	nitric acid	92 ppm
7664-39-3	Hydrofluoric acid	44 ppm
	titanium	2,000 mg/m

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#### 7 Handling and storage

- · Handling:
- · Precautions for safe handling
- Ensure good ventilation/exhaustion at the workplace.
- Prevent formation of aerosols.
- 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: No special requirements.
- · Information about storage in one common storage facility: Not required.
- 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:

#### PEL Long-term value: 5 mg/m<sup>3</sup>, 2 ppm

- REL Short-term value: 10 mg/m<sup>3</sup>, 4 ppm Long-term value: 5 mg/m<sup>3</sup>, 2 ppm
- *TLV* Short-term value: 10 mg/m<sup>3</sup>, 4 ppm Long-term value: 5.2 mg/m<sup>3</sup>, 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.
- Avoid contact with the eyes.
- Avoid contact with the eyes and skin.
- Breathing equipment:

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

• Protection of hands:



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

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· Material of gloves

(Contd. of page 4)

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

#### 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

General Information		
Appearance: Form:	Liquid	
Form: Color:	Liquid colorless	
Odor:	Characteristic	
Odor threshold:	Not determined.	
pH-value:	Not determined.	
Change in condition		
Melting point/Melting range:	Undetermined.	
Boiling point/Boiling range:	100 °C (212 °F)	
Flash point:	Not applicable.	
Flammability (solid, gaseous):	Not applicable.	
Decomposition temperature:	Not determined.	
Auto igniting:	Product is not selfigniting.	
Danger of explosion:	Product does not present an explosion hazard.	
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):	1.01257 g/cm³ (8.4499 lbs/gal)	
Bulk density:	$\sim 1,009 \text{ kg/m}^3$	
Relative density	Not determined.	
Vapor density	Not determined.	
Evaporation rate	Not determined.	
Solubility in / Miscibility with Water:	Not miscible or difficult to mix.	

HIGH-PURITY STANDARDS

# Safety Data Sheet acc. to OSHA HCS

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#### Trade name: 100062-3 Titanium (1000 µg/mL in 2% HNO3 + 0.1% HF)

		(Contd. of page
· Partition coefficient (n-octan	ol/water): Not determined.	
· Viscosity:		
Dynamic:	Not determined.	
Kinematic:	Not determined.	
Solvent content:		
Water:	97.8 %	
VOC content:	0.00~%	
	0.0 g/l / 0.00 lb/gal	
Solids content:	0.1 %	
• Other information	No further relevant information available.	

# 10 Stability and reactivity

- · Reactivity No further relevant information available.
- · Chemical stability
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- · Possibility of hazardous reactions No dangerous reactions known.
- · Conditions to avoid No further relevant information available.
- · Incompatible materials: No further relevant information available.
- · Hazardous decomposition products: No dangerous decomposition products known.

# **11 Toxicological information**

· Information on toxicological effects

· Acute toxicity:

#### · LD/LC50 values that are relevant for classification:

7664-39-3 Hydrofluoric acid

*Oral LD50 1,276 mg/kg (rat)* 

- · Primary irritant effect:
- on the skin: Strong caustic effect on skin and mucous membranes.

• on the eye:

Strong caustic effect.

Strong irritant with the danger of severe eye injury.

- Sensitization: No sensitizing effects known.
- · Additional toxicological information:

*The product shows the following dangers according to internally approved calculation methods for preparations: Corrosive* 

Irritant

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

#### · Carcinogenic categories

· IARC (International Agency for Research on Cancer)

None of the ingredients is listed.

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Trade name: 100062-3 Titanium (1000 µg/mL in 2% HNO3 + 0.1% HF)

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· 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: 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:

- Generally not hazardous for water
- 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: Disposal must be made according to official regulations.*

UN-Number DOT, ADR, IMDG, IATA	UN3264
UN proper shipping name	
DOT	Corrosive liquid, acidic, inorganic, n.o.s. (Nitric acid, Hydroge fluoride)
ADR	3264 Corrosive liquid, acidic, inorganic, n.o.s. (Nitric acid Hydrogen fluoride)
IMDG, IATA	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRI ACID, HYDROGEN FLUORIDE)

US –



Trade name: 100062-3 Titanium (1000 µg/mL in 2% HNO3 + 0.1% HF)

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(Contd. of page 7) · Transport hazard class(es) · DOT 8 Corrosive substances · Class · Label 8 · ADR, IMDG, IATA 8 Corrosive substances · Class · Label 8 · Packing group · DOT, ADR, IMDG, IATA Ш · Environmental hazards: Not applicable. Warning: Corrosive substances · Special precautions for user · Danger code (Kemler): 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: · DOT On passenger aircraft/rail: 5 L · Quantity limitations On cargo aircraft only: 60 L · ADR Code: E1 • Excepted quantities (EQ) Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml · IMDG · Limited quantities (LQ) 5LCode: E1 · Excepted quantities (EQ) Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml UN 3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. · UN "Model Regulation": (NITRIC ACID, HYDROGEN FLUORIDE), 8, III

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HIGH-PURITY STANDARDS

#### Safety Data Sheet acc. to OSHA HCS

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Trade name: 100062-3 Titanium (1000 µg/mL in 2% HNO3 + 0.1% HF)

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# **15 Regulatory information**

- $\cdot$  Safety, health and environmental regulations/legislation specific for the substance or mixture  $\cdot$  Sara
- · Section 355 (extremely hazardous substances):
- 7697-37-2 nitric acid

7664-39-3 Hydrofluoric acid

· Section 313 (Specific toxic chemical listings):

7697-37-2 nitric acid

7664-39-3 Hydrofluoric acid

• TSCA (Toxic Substances Control Act):

All ingredients are listed.

· Proposition 65

· Chemicals known to cause cancer:

None of the ingredients is listed.

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) (Substances not listed)

7697-37-2 *nitric acid* 

7664-39-3 Hydrofluoric acid

7440-32-6 titanium

7732-18-5 water, distilled, conductivity or of similar purity

· TLV (Threshold Limit Value established by ACGIH)

None of the ingredients is listed.

· NIOSH-Ca (National Institute for Occupational Safety and Health)

None of the ingredients is listed.

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



· Signal word Danger

• Hazard-determining components of labeling: nitric acid



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#### Trade name: 100062-3 Titanium (1000 µg/mL in 2% HNO3 + 0.1% HF)

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· Hazard statements H290 May be corrosive to metals. H314 Causes severe skin burns and eve damage. · Precautionary statements Keep only in original container. Do not breathe dusts or mists. Wash thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection. If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. 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. Immediately call a poison center/doctor. Specific treatment (see on this label). Wash contaminated clothing before reuse. Absorb spillage to prevent material damage. Store locked up. Store in corrosive resistant container with a resistant inner liner. 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**

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· Department issuing SDS: Environment protection department.

Contact: High-Purity Standards Tel: 843-767-7900 Fax: 843-767-7906 • Date of preparation / last revision 06/26/2019 / -• 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) VOC: Volatile Organic Compounds (USA, EU) 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 Met. Corr.1: Corrosive to metals – Category 1



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Skin Corr. 1A: Skin corrosion/irritation – Category 1A Eye Dam. 1: Serious eye damage/eye irritation – Category 1



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**GH-P** 

Reviewed on 09/10/2019

#### **1** Identification

- · Product identifier
- · Trade name: 100063-3 Tungsten (1000µg/mL in 2%HNO3 + 1% HF)
- · Article number: 100063-3
- Details of the supplier of the safety data sheet
  Manufacturer/Supplier: High-Purity Standards
  PO Box 41727 Charleston, SC 29423 United States
  Telephone: +1-843-767-7900
  Fax: +1-843-767-7906
  highpuritystandards.com
  Email: info@highpuritystandards.com
- · Information department: Product safety department

#### 2 Hazard(s) identification

· Classification of the substance or mixture

GHS06 Skull and crossbones

Acute Tox. 3 H311 Toxic in contact with skin.

GHS05 Corrosion

Met. Corr.1H290May be corrosive to metals.Skin Corr. 1AH314Causes severe skin burns and eye damage.Eye Dam. 1H318Causes serious eye damage.

· Label elements

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



· Signal word Danger

Hazard-determining components of labeling: Hydrofluoric acid nitric acid
Hazard statements H290 May be corrosive to metals. H311 Toxic in contact with skin. H314 Causes severe skin burns and eye damage.
Precautionary statements Keep only in original container. Do not breathe dusts or mists.

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#### Trade name: 100063-3 Tungsten (1000µg/mL in 2%HNO3 + 1% HF)

(Contd. of page 1)

Wash thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection. If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. 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. Immediately call a poison center/doctor. Specific treatment (see on this label). Take off immediately all contaminated clothing and wash it before reuse. Absorb spillage to prevent material damage. Store locked up. Store in corrosive resistant container with a resistant inner liner. Dispose of contents/container in accordance with local/regional/national/international regulations. · Classification system: · NFPA ratings (scale 0 - 4) Health = 3Fire = 0Reactivity = 0· HMIS-ratings (scale 0 - 4) HEALTH <sup>3</sup> Health = 3 0 Fire = 0FIRE **REACTIVITY O** 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: Mixture of the substances listed below with nonhazardous additions.

· Dangerous components:			
7697-37-2	nitric acid	2.0%	
7664-39-3	Hydrofluoric acid	1.0%	
· Chemical identification of the substance/preparation			
7732-18-5	water, distilled, conductivity or of similar purity	96.9%	
7440-33-7	tungsten	0.1%	

# 4 First-aid measures

• Description of first aid measures

• General information:

Immediately remove any clothing soiled by the product.

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

US

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Trade name: 100063-3 Tungsten (1000µg/mL in 2%HNO3 + 1% HF)

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- *After inhalation:* In case of unconsciousness place patient stably in side position for transportation.
- After skin contact: Immediately wash with water and soap and rinse thoroughly.
- After eye contact: Rinse opened eye for several minutes under running water. Then consult a doctor.
- *After swallowing:* Drink copious amounts of water and provide fresh air. Immediately call a doctor. *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 During heating or in case of fire poisonous gases are produced.*
- · Advice for firefighters
- · Protective equipment: Mouth respiratory protective device.

# 6 Accidental release measures

· Personal precautions, protective equipment and emergency procedures Mount respiratory protective device. Wear protective equipment. Keep unprotected persons away. · Environmental precautions: Do not allow to enter sewers/ surface or ground water. • Methods and material for containment and cleaning up: Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). 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. · Protective Action Criteria for Chemicals · PAC-1: 7697-37-2 nitric acid 0.16 ppm 7664-39-3 Hydrofluoric acid 1.0 ppm 7440-33-7 tungsten 10 mg/m<sup>3</sup> · PAC-2: 7697-37-2 nitric acid 24 ppm 7664-39-3 Hydrofluoric acid 24 ppm 7440-33-7 tungsten 330 mg/m<sup>3</sup> PAC-3: 7697-37-2 nitric acid 92 ppm 7664-39-3 Hydrofluoric acid 44 ppm (Contd. on page 4)

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 $2,000 \text{ mg/m}^3$ 

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Trade name: 100063-3 Tungsten (1000µg/mL in 2%HNO3 + 1% HF)

7440-33-7 tungsten

#### 7 Handling and storage

· Handling:

• **Precautions for safe handling** Ensure good ventilation/exhaustion at the workplace. Prevent formation of aerosols.

• 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: No special requirements.

· Information about storage in one common storage facility: Not required.

• 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

· Com	• Components with limit values that require monitoring at the workplace:		
7697	<i>i-37-2 nitric acid</i>		
PEL	Long-term value: 5 mg/m <sup>3</sup> , 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/m <sup>3</sup> , 4 ppm Long-term value: 5.2 mg/m <sup>3</sup> , 2 ppm		
7664	-39-3 Hydrofluoric acid		
PEL	Long-term value: 3 ppm as F		
REL	Long-term value: 2.5 mg/m <sup>3</sup> , 3 ppm Ceiling limit value: 5* mg/m <sup>3</sup> , 6* ppm *15-min, as F		
TLV	Long-term value: 0.41 mg/m³, 0.5 ppm Ceiling limit value: 1.64 mg/m³, 2 ppm as F; Skin, BEI		
L	(Contd. on page 5)		

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# Trade name: 100063-3 Tungsten (1000µg/mL in 2%HNO3 + 1% HF)

(Contd. of page 4)
· Ingredients with biological limit values: 7664-39-3 Hydrofluoric acid
BEI 3 mg/g creatinine
Medium: urine
Time: prior to shift
Parameter: Fluorides (background, nonspecific)
10 mg/g creatinine
Medium: urine
Time: end of shift
Parameter: Fluorides (background, nonspecific)
• 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 eyes.
Avoid contact with the eyes. Avoid contact with the eyes and skin.
· Breathing equipment:
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use
respiratory protective device that is independent of circulating air.
· Protection of hands:
Protective gloves
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
· Material of gloves
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
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

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#### Trade name: 100063-3 Tungsten (1000µg/mL in 2%HNO3 + 1% HF)

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Information on basic physical and c	hemical properties	
General Information		
Appearance:		
Form:	Liquid	
Color: Odor:	colorless Characteristic	
Odor threshold:	Not determined.	
pH-value:	Not determined.	
Change in condition		
Melting point/Melting range:	Undetermined.	
Boiling point/Boiling range:	100 °C (212 °F)	
Flash point:	Not applicable.	
Flammability (solid, gaseous):	Not applicable.	
Decomposition temperature:	Not determined.	
Auto igniting:	Product is not selfigniting.	
Danger of explosion:	Product does not present an explosion hazard.	
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):	1.01834 g/cm³ (8.49805 lbs/gal)	
Bulk density:	1,003 kg/m <sup>3</sup>	
Relative density	Not determined.	
Vapor density	Not determined.	
Evaporation rate	Not determined.	
Solubility in / Miscibility with		
Water:	Not miscible or difficult to mix.	
Partition coefficient (n-octanol/wate	er): Not determined.	
Viscosity:		
Dynamic:	Not determined.	
Kinematic:	Not determined.	
Solvent content:		
Water:	96.9 %	
VOC content:		
	0.0 g/l / 0.00 lb/gal	
Solids content:	0.1 %	
Other information	No further relevant information available.	

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#### **10 Stability and reactivity**

- · Reactivity No further relevant information available.
- · Chemical stability
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- · Possibility of hazardous reactions No dangerous reactions known.
- · Conditions to avoid No further relevant information available.
- · Incompatible materials: No further relevant information available.
- · Hazardous decomposition products: No dangerous decomposition products known.

# 11 Toxicological information

· Information on toxicological effects

• Acute toxicity:

· LD/LC50 values that are relevant for classification:

7664-39-3 Hydrofluoric acid

*Oral LD50 1,276 mg/kg (rat)* 

- Primary irritant effect:
- on the skin: Strong caustic effect on skin and mucous membranes.
- on the eye:
- Strong caustic effect.

Strong irritant with the danger of severe eye injury.

• Sensitization: No sensitizing effects known.

• Additional toxicological information:

The product shows the following dangers according to internally approved calculation methods for preparations: Toxic

- Corrosive
- Irritant

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

· Carcinogenic categories

· IARC (International Agency for Research on Cancer)

None of the ingredients is listed.

· 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: 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.

(Contd. on page 8)

*Printing date 09/10/2019* 

Reviewed on 09/10/2019

#### Trade name: 100063-3 Tungsten (1000µg/mL in 2%HNO3 + 1% HF)

(Contd. of page 7)

• 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.

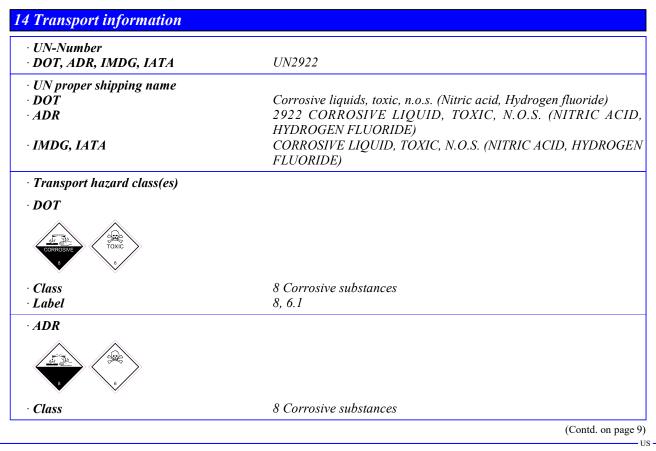
# **13 Disposal considerations**

• Waste treatment methods

· Recommendation:

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

- · Uncleaned packagings:
- Recommendation: Disposal must be made according to official regulations.





Printing date 09/10/2019

Reviewed on 09/10/2019

# Trade name: 100063-3 Tungsten (1000µg/mL in 2%HNO3 + 1% HF)

	(Contd. of page
Label	8+6.1
IMDG	
Class	8 Corrosive substances
Label	8/6.1
IATA	
Class	8 Corrosive substances
Label	8 (6.1)
Packing group DOT, ADR, IMDG, IATA	111
Environmental hazards:	Not applicable.
Special precautions for user	Warning: Corrosive substances
Danger code (Kemler):	86
EMS Number:	F-A,S-B
Segregation groups	Strong acids
Stowage Category	B CHARLES CHAR
Stowage Code	SW2 Clear of living quarters.
Transport in bulk according to Anne MARPOL73/78 and the IBC Code	<b>x II of</b> Not applicable.
Transport/Additional information:	
DOT	
Quantity limitations	On passenger aircraft/rail: 5 L
	On cargo aircraft only: 60 L
ADR	
Excepted quantities (EQ)	Code: El
	Maximum net quantity per inner packaging: 30 ml
	Maximum net quantity per outer packaging: 1000 ml
IMDG	
Limited quantities (LQ)	5L
Excepted quantities (EQ)	Code: El
	Maximum net quantity per inner packaging: 30 ml
	Maximum net quantity per outer packaging: 1000 ml
UN "Model Regulation":	UN 2922 CORROSIVE LIQUID, TOXIC, N.O.S. (NITRIC ACI HYDROGEN FLUORIDE), 8 (6.1), III

(Contd. on page 10)

*Printing date 09/10/2019* 

Reviewed on 09/10/2019

Trade name: 100063-3 Tungsten (1000µg/mL in 2%HNO3 + 1% HF)

(Contd. of page 9)

#### **15 Regulatory information**

 $\cdot$  Safety, health and environmental regulations/legislation specific for the substance or mixture  $\cdot$  Sara

· Section 355 (extremely hazardous substances):

7697-37-2 nitric acid

7664-39-3 Hydrofluoric acid

· Section 313 (Specific toxic chemical listings):

7697-37-2 nitric acid

7664-39-3 Hydrofluoric acid

• TSCA (Toxic Substances Control Act):

All components have the value ACTIVE.

· Hazardous Air Pollutants

7664-39-3 Hydrofluoric acid

· Proposition 65

· Chemicals known to cause cancer:

None of the ingredients is listed.

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)

None of the ingredients is listed.

· NIOSH-Ca (National Institute for Occupational Safety and Health)

None of the ingredients is listed.

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



· Signal word Danger

• *Hazard-determining components of labeling: Hydrofluoric acid nitric acid* 



Printing date 09/10/2019

Reviewed on 09/10/2019

#### Trade name: 100063-3 Tungsten (1000µg/mL in 2%HNO3 + 1% HF)

(Contd. of page 10)

· Hazard statements H290 May be corrosive to metals. H311 Toxic in contact with skin. H314 Causes severe skin burns and eye damage. · Precautionary statements Keep only in original container. Do not breathe dusts or mists. Wash thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection. If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. 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. Immediately call a poison center/doctor. Specific treatment (see on this label). Take off immediately all contaminated clothing and wash it before reuse. Absorb spillage to prevent material damage. Store locked up. Store in corrosive resistant container with a resistant inner liner. 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**

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- · Department issuing SDS: Environment protection department.
- · Contact: *High-Purity Standards* Tel: 843-767-7900 Fax: 843-767-7906 · Date of preparation / last revision 09/10/2019 / -· 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) VOC: Volatile Organic Compounds (USA, EU) 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 (Contd. on page 12) US

Printing date 09/10/2019

Reviewed on 09/10/2019

Trade name: 100063-3 Tungsten (1000µg/mL in 2%HNO3 + 1% HF)

(Contd. of page 11)

REL: Recommended Exposure Limit BEI: Biological Exposure Limit Met. Corr. 1: Corrosive to metals – Category 1 Acute Tox. 3: Acute toxicity – Category 3 Skin Corr. 1A: Skin corrosion/irritation – Category 1A Eye Dam. 1: Serious eye damage/eye irritation – Category 1



US

**H-PURITY** ANDARDS Safety Data Sheet acc. to OSHA HCS

Printing date 08/27/2019

Reviewed on 08/27/2019

<b>1 Identification</b>	1
· Product identif	er
· Trade name: Z	irconium 1000 µg/mL 2% HNO3 + 0.5% HF
· Article number	: 100069-3
Manufacturer/ High-Purity Sta PO Box 41727 Telephone: +1- Fax: +1-843-70 highpuritystand	ndards Charleston, SC 29423 United States 843-767-7900 57-7906
Information de Emergency tele INFOTRAC	partment: Product safety department phone number:
	phone numbers1-800-535-5053 y telephone numbers 1-352-323-3500
2 Hazard(s) id	entification
	f the substance or mixture
	j the substance or mixture
GHS	06 Skull and crossbones
Acute Tox. 3	H311 Toxic in contact with skin.
GHS	05 Corrosion
Met. Corr.1 1	H290 May be corrosive to metals.
Skin Corr. 1A	H314 Causes severe skin burns and eye damage.
Eye Dam. 1	H318 Causes serious eye damage.
GHS	07
Acute Tox. 4	H302 Harmful if swallowed.
<ul> <li>Label elements</li> <li>GHS label elem</li> <li>Hazard pictogram</li> </ul>	ents The product is classified and labeled according to the Globally Harmonized System (GHS). ams
GHS05 GHS	506
· Signal word Da	nger
~.5 Du	(Contd. on page 2)

HIGH-PURITY STANDARDS

Safety Data Sheet acc. to OSHA HCS

Printing date 08/27/2019

Reviewed on 08/27/2019

Trade name: Zirconium 1000 µg/mL 2% HNO3 + 0.5% HF

(Contd. of page 1) · Hazard-determining components of labeling: nitric acid hydrofluoric acid · Hazard statements H290 May be corrosive to metals. H302 Harmful if swallowed. H311 Toxic in contact with skin. H314 Causes severe skin burns and eye damage. · Precautionary statements Keep only in original container. Do not breathe dusts or mists. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective gloves/protective clothing/eye protection/face protection. If swallowed: Call a poison center/doctor if you feel unwell. If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. 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. Immediately call a poison center/doctor. Specific treatment (see on this label). Take off immediately all contaminated clothing and wash it before reuse. Absorb spillage to prevent material damage. Store locked up. Store in corrosive resistant container with a resistant inner liner. Dispose of contents/container in accordance with local/regional/national/international regulations. · Classification system: · NFPA ratings (scale 0 - 4) Health = 3Fire = 0Reactivity = 0· HMIS-ratings (scale 0 - 4) HEALTH 3 Health = 3FIRE 0 Fire = 0**REACTIVITY** 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: Mixture of the substances listed below with nonhazardous additions.

(Contd. on page 3)

US

Printing date 08/27/2019

Reviewed on 08/27/2019

Trade name: Zirconium 1000 µg/mL 2% HNO3 + 0.5% HF

	(Contd. of page 2)
· Dangerous components:	
7697-37-2 nitric acid	2.0%
7664-39-3 hydrofluoric acid	0.5%
· Chemical identification of the substance/preparation	
7732-18-5 water, distilled, conductivity or of similar purity	97.4%
7440-67-7 zirconium	0.1%

#### 4 First-aid measures

· Description of first aid measures

• General information:

Immediately remove any clothing soiled by the product.

Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

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

- *After inhalation:* In case of unconsciousness place patient stably in side position for transportation.
- After skin contact: Immediately wash with water and soap and rinse thoroughly.
- After eye contact: Rinse opened eye for several minutes under running water. Then consult a doctor.
- After swallowing:
- Immediately call a doctor.

Drink copious amounts of water and provide fresh air. Immediately call a doctor.

- · 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
- During heating or in case of fire poisonous gases are produced. • Advice for firefighters
- · Aavice for firefighters
- Protective equipment: Mouth respiratory protective device.

# 6 Accidental release measures

• *Personal precautions, protective equipment and emergency procedures Mount respiratory protective device. Wear protective equipment. Keep unprotected persons away.* 

• Environmental precautions: Dilute with plenty of water.

• Methods and material for containment and cleaning up:

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Use neutralizing agent.

Dispose contaminated material as waste according to item 13.

*Ensure adequate ventilation.* 

(Contd. on page 4)

IIGH-PURITY

Reviewed on 08/27/2019

Trade name: Zirconium 1000 µg/mL 2% HNO3 + 0.5% HF

	(Contd. of page 3)
• <b>Reference to other sections</b> See Section 7 for information on safe handling.	
See Section 7 for information on safe numering. See Section 8 for information on personal protection equipment.	
See Section 13 for disposal information.	
· Protective Action Criteria for Chemicals	
· PAC-1:	
7697-37-2 nitric acid	0.16 ppm
7440-67-7 zirconium	10 mg/m <sup>3</sup>
• PAC-2:	
7697-37-2 nitric acid	24 ppm
7440-67-7 zirconium	83 mg/m <sup>3</sup>
· PAC-3:	
7697-37-2 nitric acid	92 ppm
7440-67-7 zirconium	500 mg/m <sup>3</sup>

#### 7 Handling and storage

· Handling:

· Precautions for safe handling

Ensure good ventilation/exhaustion at the workplace.

Prevent formation of aerosols.

• 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: No special requirements.

· Information about storage in one common storage facility: Not required.

- 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:

#### 7697-37-2 nitric acid

PEL Long-term value: 5 mg/m<sup>3</sup>, 2 ppm

REL Short-term value: 10 mg/m<sup>3</sup>, 4 ppm

Long-term value: 5 mg/m<sup>3</sup>, 2 ppm

*TLV* Short-term value: 10 mg/m<sup>3</sup>, 4 ppm Long-term value: 5.2 mg/m<sup>3</sup>, 2 ppm

(Contd. on page 5)

# Safety Data Sheet

acc. to OSHA HCS

Printing date 08/27/2019

Reviewed on 08/27/2019

*Trade name: Zirconium 1000 µg/mL 2% HNO3 + 0.5% HF* 

(Contd. of page 4) 7664-39-3 hydrofluoric acid PEL Long-term value: 3 ppm as F REL Long-term value: 2.5 mg/m<sup>3</sup>, 3 ppm Ceiling limit value: 5\* mg/m<sup>3</sup>, 6\* ppm \*15-min, as F TLV Long-term value: 0.41 mg/m<sup>3</sup>, 0.5 ppm Ceiling limit value: 1.64 mg/m<sup>3</sup>, 2 ppm as F; Skin; BEI · Ingredients with biological limit values: 7664-39-3 hydrofluoric acid *BEI* 3 mg/g creatinine Medium: urine *Time: prior to shift* Parameter: Flourides (background) 10 mg/g creatinine Medium: urine Time: end of shift Parameter: Flourides (background) • 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 eyes. Avoid contact with the eyes and skin. • Breathing equipment: In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air. · Protection of hands: Protective gloves The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture. Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation · Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

(Contd. on page 6)

#### Printing date 08/27/2019

Reviewed on 08/27/2019

*Trade name: Zirconium 1000 µg/mL 2% HNO3 + 0.5% HF* 

(Contd. of page 5)

· Penetration time of glove material

H-PURITY

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

Information on basic physical and c	hemical properties	
General Information		
Appearance:		
Form:	Liquid	
Color:	colorless	
Odor:	Characteristic	
Odor threshold:	Not determined.	
pH-value:	Not determined.	
Change in condition		
Melting point/Melting range:	Undetermined.	
Boiling point/Boiling range:	Undetermined.	
Flash point:	Not applicable.	
Flammability (solid, gaseous):	Not applicable.	
Decomposition temperature:	Not determined.	
Auto igniting:	Product is not selfigniting.	
Danger of explosion:	Product does not present an explosion hazard.	
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):	1.01061 g/cm <sup>3</sup> (8.43354 lbs/gal)	
Bulk density:	1,011 kg/m³	
Relative density	Not determined.	
Vapor density	Not determined.	
Evaporation rate	Not determined.	
Solubility in / Miscibility with		
Water:	Fully miscible.	
Partition coefficient (n-octanol/wate	<b>r</b> ): Not determined.	
Viscosity:		
Dynamic:	Not determined.	



Printing date 08/27/2019

Reviewed on 08/27/2019

#### Trade name: Zirconium 1000 µg/mL 2% HNO3 + 0.5% HF

	(Contd. of	f page 6
Kinematic:	Not determined.	
· Solvent content:		
Water:	97.4 %	
VOC content:	0.00 %	
	0.0 g/l / 0.00 lb/gal	
Solids content:	0.1 %	
• Other information	No further relevant information available.	

#### **10 Stability and reactivity**

· Reactivity No further relevant information available.

- · Chemical stability
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- · Possibility of hazardous reactions No dangerous reactions known.
- Conditions to avoid No further relevant information available.
- · *Incompatible materials:* No further relevant information available.
- · Hazardous decomposition products: No dangerous decomposition products known.

#### **11 Toxicological information**

- · Information on toxicological effects
- Acute toxicity:
- Primary irritant effect:
- on the skin: Strong caustic effect on skin and mucous membranes.
- on the eye:
- Strong caustic effect.
- Strong irritant with the danger of severe eye injury.
- Sensitization: No sensitizing effects known.
- · Additional toxicological information:

*The product shows the following dangers according to internally approved calculation methods for preparations: Toxic* 

- Harmful
- Corrosive
- Irritant

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

#### · Carcinogenic categories

· IARC (International Agency for Research on Cancer)

None of the ingredients is listed.

#### · NTP (National Toxicology Program)

None of the ingredients is listed.

#### · OSHA-Ca (Occupational Safety & Health Administration)

None of the ingredients is listed.

(Contd. on page 8)

Printing date 08/27/2019

Reviewed on 08/27/2019

Trade name: Zirconium 1000 μg/mL 2% HNO3 + 0.5% HF

(Contd. of page 7)

#### **12 Ecological information**

- · Toxicity
- · Aquatic 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:
- Not hazardous for water.
- 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: Disposal must be made according to official regulations.*
- *Recommended cleansing agent:* Water, if necessary with cleansing agents.

UN-Number DOT, ADR, IMDG, IATA	UN2922
UN proper shipping name	
DOT	Corrosive liquids, toxic, n.o.s. (Hydrofluoric acid, Nitric acid)
ADR	2922 CORROSIVE LIQUID, TOXIC, N.O.S. (HYDROFLUOR ACID, NITRIC ACID)
IMDG, IATA	CORROSIVE LIQUID, TOXIC, N.O.S. (HYDROFLUORIC ACI NITRIC ACID)
Transport hazard class(es)	
DOT	
Class	8 Corrosive substances



Printing date 08/27/2019

Reviewed on 08/27/2019

#### Trade name: Zirconium 1000 µg/mL 2% HNO3 + 0.5% HF (Contd. of page 8) · Label 8, 6.1 · ADR · Class 8 Corrosive substances · Label 8+6.1 · IMDG · Class 8 Corrosive substances · Label 8/6.1 ·IATA · Class 8 Corrosive substances · Label 8 (6.1) · Packing group · DOT, ADR, IMDG, IATA Ш · Environmental hazards: Not applicable. · Special precautions for user Warning: Corrosive substances • Danger code (Kemler): 86 • EMS Number: F-A, S-B· Segregation groups Strong acids · Stowage Category В · 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: · DOT • Quantity limitations On passenger aircraft/rail: 5 L On cargo aircraft only: 60 L · ADR • Excepted quantities (EQ) Code: E1

Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml

> (Contd. on page 10) US



*Printing date 08/27/2019* 

Reviewed on 08/27/2019

Trade name: Zirconium 1000 µg/mL 2% HNO3 + 0.5% HF

	(Contd. of page 9)
· IMDG · Limited quantities (LQ) · Excepted quantities (EQ)	5L Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml
· UN "Model Regulation":	UN 2922 CORROSIVE LIQUID, TOXIC, N.O.S. (HYDROFLUORIC ACID, NITRIC ACID), 8 (6.1), III

**15 Regulatory information** 

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

7697-37-2 nitric acid

• Section 313 (Specific toxic chemical listings): 7697-37-2 nitric acid

• TSCA (Toxic Substances Control Act):

ISCA (Toxic Subsumes Completacly.		
7732-18-5	water, distilled, conductivity or of similar purity	ACTIVE
7697-37-2	nitric acid	ACTIVE
7440-67-7	zirconium	ACTIVE

· Hazardous Air Pollutants

None of the ingredients is listed.

· Proposition 65

· Chemicals known to cause cancer:

None of the ingredients is listed.

· 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)

7440-67-7 zirconium

·NIOSH-Ca (National Institute for Occupational Safety and Health)

None of the ingredients is listed.

• GHS label elements The product is classified and labeled according to the Globally Harmonized System (GHS). (Contd. on page 11)

A4

Printing date 08/27/2019

Reviewed on 08/27/2019

Trade name: Zirconium 1000 µg/mL 2% HNO3 + 0.5% HF (Contd. of page 10) · Hazard pictograms GHS05 GHS06 · Signal word Danger · Hazard-determining components of labeling: nitric acid hydrofluoric acid · Hazard statements H290 May be corrosive to metals. H302 Harmful if swallowed. H311 Toxic in contact with skin. H314 Causes severe skin burns and eye damage. · Precautionary statements Keep only in original container. Do not breathe dusts or mists. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective gloves/protective clothing/eye protection/face protection. If swallowed: Call a poison center/doctor if you feel unwell. If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. 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. Immediately call a poison center/doctor. Specific treatment (see on this label). Take off immediately all contaminated clothing and wash it before reuse. Absorb spillage to prevent material damage. Store locked up. Store in corrosive resistant container with a resistant inner liner. 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**

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· Department issuing SDS: Environment protection department.

· Contact: *High-Purity Standards* Tel: 843-767-7900 Fax: 843-767-7906 · Date of preparation / last revision 08/27/2019 / -• 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 (Contd. on page 12)



Printing date 08/27/2019

Reviewed on 08/27/2019

*Trade name: Zirconium 1000 μg/mL 2% HNO3 + 0.5% HF* 

(Contd. of page 11)

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) VOC: Volatile Organic Compounds (USA, EU) 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 BEI: Biological Exposure Limit Met. Corr.1: Corrosive to metals – Category 1 Acute Tox. 4: Acute toxicity - Category 4 Acute Tox. 3: Acute toxicity – Category 3 Skin Corr. 1A: Skin corrosion/irritation - Category 1A Eye Dam. 1: Serious eye damage/eye irritation - Category 1

