

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

Printing date 10/14/2020

Reviewed on 10/14/2020

**1 Identification**· **Product identifier**· **Product name: Barium Standard: 10000 µg/mL Ba in 5% HNO<sub>3</sub> [100ml bottle]**· **Part number:** 5190-8358· **Application of the substance / the mixture** Reagents and Standards for Analytical Chemical Laboratory Use· **Details of the supplier of the safety data sheet**· **Manufacturer/Supplier:**Agilent Technologies, Inc.  
5301 Stevens Creek Blvd  
Santa Clara, CA 95051,  
USA

Tel: 800-227-9770

· **Information department:** e-mail: [pdl-msds\\_author@agilent.com](mailto:pdl-msds_author@agilent.com)· **Emergency telephone number:** CHEMTREC®: 1-800-424-9300**2 Hazard(s) identification**· **Classification of the substance or mixture**

GHS03 Flame over circle

Ox. Liq. 3     H272 May intensify fire; oxidizer.



GHS05 Corrosion

Met. Corr.1     H290 May be corrosive to metals.

Skin Corr. 1B     H314 Causes severe skin burns and eye damage.

Eye Dam. 1     H318 Causes serious eye damage.

· **Label elements**· **GHS label elements**

The product is classified and labeled according to the Globally Harmonized System (GHS).

· **Hazard pictograms**

GHS03



GHS05

· **Signal word** Danger· **Hazard-determining components of labeling:**

Nitric acid

· **Hazard statements**

H272 May intensify fire; oxidizer.

H290 May be corrosive to metals.

H314 Causes severe skin burns and eye damage.

· **Precautionary statements**

P221     Take any precaution to avoid mixing with combustibles.

P280     Wear protective gloves/protective clothing/eye protection/face protection.

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**P303+P361+P353** *If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.*

**P305+P351+P338** *If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.*

**P310** *Immediately call a poison center/doctor.*

**P405** *Store locked up.*

**P501** *Dispose of contents/container in accordance with local/regional/national/international regulations.*

· **Classification system:**

· **NFPA ratings (scale 0 - 4)**



Health = 3

Fire = 3

Reactivity = 0

*The substance possesses oxidizing properties.*

· **HMIS-ratings (scale 0 - 4)**



Health = 3

Fire = 3

Reactivity = 0

· **Other hazards**

· **Results of PBT and vPvB assessment**

· **PBT:** Not applicable.

· **vPvB:** Not applicable.

### 3 Composition/information on ingredients

· **Chemical characterization: Mixtures**

· **Description:** Aqueous solution.

· **Dangerous components:**

CAS: 7697-37-2 RTECS: QU5775000	Nitric acid Ox. Liq. 2, H272; Met. Corr.1, H290; Skin Corr. 1A, H314	<10%
CAS: 10022-31-8 RTECS: CQ 9625000	Barium nitrate Ox. Sol. 2, H272; Acute Tox. 4, H302; Acute Tox. 4, H332; Eye Irrit. 2A, H319	<2%

· **Additional information:**

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

### 4 First-aid measures

· **Description of first aid measures**

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

· **After inhalation:** Supply fresh air; consult doctor in case of complaints.

· **After skin contact:**

*Immediately wash with water and soap and rinse thoroughly.*

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- Seek immediate medical advice.
After eye contact: Rinse opened eye for several minutes under running water. Then consult a doctor.
After swallowing: Rinse mouth. Do not induce vomiting.
Information for doctor:
Most important symptoms and effects, both acute and delayed No further relevant information available.
Indication of any immediate medical attention and special treatment needed
No further relevant information available.

5 Fire-fighting measures

- Extinguishing media
Suitable extinguishing agents: Use fire fighting measures that suit the environment.
Special hazards arising from the substance or mixture
During heating or in case of fire poisonous gases are produced.
Advice for firefighters
Protective equipment:
Mouth respiratory protective device.
Wear self-contained 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.
Do not allow to enter sewers/ surface or ground water.
Methods and material for containment and cleaning up:
Use neutralizing agent.
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
Absorb liquid components with liquid-binding material.
DO NOT USE SAWDUST.
Reference to other sections
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
Protective Action Criteria for Chemicals

PAC-1:

Table with 3 columns: CAS number, Chemical name, and Concentration. Rows include Nitric acid (0.16 ppm) and Barium nitrate (2.9 mg/m³).

PAC-2:

Table with 3 columns: CAS number, Chemical name, and Concentration. Rows include Nitric acid (24 ppm) and Barium nitrate (350 mg/m³).

PAC-3:

Table with 3 columns: CAS number, Chemical name, and Concentration. Row includes Nitric acid (92 ppm).

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Table with 2 columns: CAS: 10022-31-8 Barium nitrate and (Contd. of page 3) 2,100 mg/m³

7 Handling and storage

- Handling:
Precautions for safe handling
Information about protection against explosions and fires:
Conditions for safe storage, including any incompatibilities
Storage:
Requirements to be met by storerooms and receptacles:
Information about storage in one common storage facility:
Further information about storage conditions:
Specific end use(s)

8 Exposure controls/personal protection

- Additional information about design of technical systems:
Control parameters

Components with limit values that require monitoring at the workplace:

Table with 2 columns: CAS: 7697-37-2 Nitric acid and CAS: 10022-31-8 Barium nitrate, listing PEL, REL, and TLV values for both substances.

- Additional information:
Exposure controls
Personal protective equipment:
General protective and hygienic measures:

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*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:**

*The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.*

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

*The protective gloves to be used must comply with the specifications of EC Directive 89/686/EEC and the related standard EN374*



*Protective gloves*

· **Material of gloves**

*PVC gloves*

*Neoprene gloves*

· **Penetration time of glove material**

*The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.*

· **Eye protection:**



*Tightly sealed goggles*

### 9 Physical and chemical properties

· **Information on basic physical and chemical properties**

· **General Information**

· **Appearance:**

**Form:** *Liquid*

**Color:** *Colorless*

· **Odor:** *Odorless*

· **Odor threshold:** *Not determined.*

· **pH-value:** *<2*

· **Change in condition**

**Melting point/Melting range:** *Not determined.*

**Boiling point/Boiling range:** *83 °C (181.4 °F)*

· **Flash point:** *Not applicable.*

· **Flammability (solid, gaseous):** *Not determined.*

· **Ignition temperature:** *Not determined*

· **Decomposition temperature:** *Not determined.*

· **Auto igniting:** *Product is not selfigniting.*

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· <b>Danger of explosion:</b>	<i>Not determined.</i>
· <b>Explosion limits:</b>	
<b>Lower:</b>	<i>Not determined.</i>
<b>Upper:</b>	<i>Not determined.</i>
· <b>Vapor pressure at 20 °C (68 °F):</b>	<i>23 hPa (17.3 mm Hg)</i>
· <b>Density at 20 °C (68 °F):</b>	<i>1.05258 g/cm<sup>3</sup> (8.78378 lbs/gal)</i>
· <b>Relative density</b>	<i>Not determined.</i>
· <b>Vapor density</b>	<i>Not determined.</i>
· <b>Evaporation rate</b>	<i>Not determined.</i>
· <b>Solubility in / Miscibility with Water:</b>	<i>Fully miscible.</i>
· <b>Partition coefficient (n-octanol/water):</b>	<i>Not determined.</i>
· <b>Viscosity:</b>	
<b>Dynamic:</b>	<i>Not determined.</i>
<b>Kinematic:</b>	<i>Not determined.</i>
· <b>Other information</b>	<i>No further relevant information available.</i>

### 10 Stability and reactivity

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

### 11 Toxicological information

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

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

**CAS: 7697-37-2 Nitric acid**

Inhalative	LC50/4 h	130 mg/l (rat)
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**CAS: 10022-31-8 Barium nitrate**

Oral	LD50	355 mg/kg (rat)
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- **Primary irritant effect:**
- **on the skin:** *Caustic effect on skin and mucous membranes.*

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- on the eye: Strong caustic effect. Strong irritant with the danger of severe eye injury.
Sensitization: Based on available data, the classification criteria are not met.
Additional toxicological information: The product shows the following dangers according to internally approved calculation methods for preparations: 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

Table with 2 columns: Category (IARC, NTP, OSHA-Ca) and Description (None of the ingredients is listed).

12 Ecological information

Toxicity

Table with 2 columns: Aquatic toxicity (CAS: 7697-37-2 Nitric acid) and LC50/48 (180 mg/l (crustacean)).

- Persistence and degradability No further relevant information available.
Behavior in environmental systems:
Bioaccumulative potential No further relevant information available.
Mobility in soil No further relevant information available.
Additional ecological information:
General notes: Water hazard class 1 (Self-assessment): slightly hazardous for water Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system. Must not reach bodies of water or drainage ditch undiluted or unneutralized.
Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.
Other adverse effects No further relevant information available.

13 Disposal considerations

- Waste treatment methods
Recommendation: Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

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

14 Transport information

- UN-Number
DOT, ADR, IMDG, IATA UN2031
DOT Nitric acid solution
ADR 2031 NITRIC ACID solution
IMDG, IATA NITRIC ACID solution

Transport hazard class(es)

DOT



- Class 8 Corrosive substances
Label 8

ADR, IMDG, IATA



- Class 8 Corrosive substances
Label 8

Packing group

DOT, ADR, IMDG, IATA II

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 D

Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable.

Transport/Additional information:

- ADR
Excepted quantities (EQ) Code: E2
Maximum net quantity per inner packaging: 30 ml
Maximum net quantity per outer packaging: 500 ml

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· **UN "Model Regulation":** UN 2031 NITRIC ACID SOLUTION, 8, II

### 15 Regulatory information

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

· **Section 355 (extremely hazardous substances):**

CAS: 7697-37-2	Nitric acid
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· **Section 313 (Specific toxic chemical listings):**

CAS: 7697-37-2	Nitric acid
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CAS: 10022-31-8	Barium nitrate
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· **TSCA (Toxic Substances Control Act):**

All components have the value ACTIVE.

· **Hazardous Air Pollutants**

None of the ingredients is listed.

· **Proposition 65**

· **Chemicals known to cause cancer:**

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)**

CAS: 10022-31-8	Barium nitrate	D, CBD(inh), NL(oral)
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· **TLV (Threshold Limit Value established by ACGIH)**

CAS: 10022-31-8	Barium nitrate	A4
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· **NIOSH-Ca (National Institute for Occupational Safety and Health)**

None of the ingredients is listed.

· **Hazard pictograms**



GHS03 GHS05

· **Signal word** Danger

· **Hazard-determining components of labeling:**

Nitric acid

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**· Hazard statements***H272 May intensify fire; oxidizer.**H290 May be corrosive to metals.**H314 Causes severe skin burns and eye damage.***· Precautionary statements***P221 Take any precaution to avoid mixing with combustibles.**P280 Wear protective gloves/protective clothing/eye protection/face protection.**P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.**P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.**P310 Immediately call a poison center/doctor.**P405 Store locked up.**P501 Dispose of contents/container in accordance with local/regional/national/international regulations.***· Chemical safety assessment:** *A Chemical Safety Assessment has not been carried out.***16 Other information**

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

**· Date of preparation / last revision** 10/14/2020 / 1**· Abbreviations and acronyms:***ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)**IMDG: International Maritime Code for Dangerous Goods**DOT: US Department of Transportation**IATA: International Air Transport Association**ACGIH: American Conference of Governmental Industrial Hygienists**EINECS: European Inventory of Existing Commercial Chemical Substances**ELINCS: European List of Notified Chemical Substances**CAS: Chemical Abstracts Service (division of the American Chemical Society)**NFPA: National Fire Protection Association (USA)**HMIS: Hazardous Materials Identification System (USA)**LC50: Lethal concentration, 50 percent**LD50: Lethal dose, 50 percent**PBT: Persistent, Bioaccumulative and Toxic**vPvB: very Persistent and very Bioaccumulative**NIOSH: National Institute for Occupational Safety**OSHA: Occupational Safety & Health**TLV: Threshold Limit Value**PEL: Permissible Exposure Limit**REL: Recommended Exposure Limit**Ox. Liq. 2: Oxidizing liquids – Category 2**Ox. Liq. 3: Oxidizing liquids – Category 3**Ox. Sol. 2: Oxidizing solids – Category 2**Met. Corr. 1: Corrosive to metals – Category 1**Acute Tox. 4: Acute toxicity – Category 4**Skin Corr. 1A: Skin corrosion/irritation – Category 1A**Skin Corr. 1B: Skin corrosion/irritation – Category 1B**Eye Dam. 1: Serious eye damage/eye irritation – Category 1**Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A***· Sources**

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

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

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