

## Section 1. Product and Company Identification

Product Identification: ICP-MS-68A Solution A  
 MSDS Number: ICP-MS-68A Solution A  
 Recommended Use: For Laboratory Use.  
 Company Identification: High-Purity Standards  
 P.O. Box 41727  
 Charleston, SC 29423  
 Telephone: (843) 767-7900  
 FAX: (843) 767-7906

In case of emergency call INFOTRAC: 800-535-5053

## Section 2. Hazard Identification

**Classification:**

Skin Corrosion/Irritation, Category 1B  
 Serious Eye Damage/ Eye Irritation, Category 1

**Labeling:****Symbol:**

**Signal Word:** Danger.

**Hazard Statement:** Causes severe skin burns and eye damage. Causes serious eye damage. Suspected of causing cancer.

**Precautionary Statement:** Wear protective gloves/clothing and eye/face protection. Wash thoroughly after handling. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required.

## Section 3. Composition

Component	CAS/EINECS Registry #	Percent Concentration
Aluminum	7429-90-5/ 231-072-3	0.001
Arsenic	7440-38-2/ 231-148-6	0.001
Barium Carbonate (BaCO <sub>3</sub> )	513-77-9/ 208-167-3	0.001 (as Ba)
Barium Nitrate (Ba(NO <sub>3</sub> ) <sub>2</sub> )	10022-31-8/233-020-5	
Beryllium Acetate (Be <sub>4</sub> O(C <sub>2</sub> H <sub>3</sub> O <sub>2</sub> ) <sub>6</sub> )	19049-40-2/ 242-785-4	0.001 (as Be)
Bismuth	7440-69-9/ 231-177-4	0.001
Boric Acid (H <sub>3</sub> BO <sub>3</sub> )	10043-35-3/ 233-139-2	0.001 (as B)
Calcium Carbonate (CaCO <sub>3</sub> )	471-34-1/ 207-439-9	0.001 (as Ca)
Cadmium	7440-43-9/ 231-152-8	0.001
Cerium Oxide (CeO <sub>2</sub> )	1306-38-3/ 215-150-4	0.001 (as Ce)
Cesium Carbonate (Cs <sub>2</sub> CO <sub>3</sub> )	534-17-8 / 208-591-9	0.001 (as Cs)
Chromium	7440-47-3/ 231-157-5	0.001

<b>Safety Data Sheet No. ICP-MS-68A Solution A</b>	<b>Date: July 12, 2011</b>	
<b>ICP-MS-68A Solution A</b>	<b>Revision: New</b>	<b>Page 2 of 8</b>

Cobalt	7440-48-4/ 231-158-0	0.001
Copper	7440-50-8/ 231-159-6	0.001
Dysprosium Oxide (Dy <sub>2</sub> O <sub>3</sub> )	1308-87-8/ 215-164-0	0.001 (as Dy)
Erbium Oxide (Er <sub>2</sub> O <sub>3</sub> )	12061-16-4/ 235-045-7	0.001 (as Er)
Europium Oxide (Eu <sub>2</sub> O <sub>3</sub> )	1308-96-9/ 215-165-6	0.001 (as Eu)
Gadolinium Oxide (Gd <sub>2</sub> O <sub>3</sub> )	12064-62-9/ 235-060-9	0.001 (as Gd)
Gallium	7440-55-3/ 231-163-8	0.001
Holmium Oxide (Ho <sub>2</sub> O <sub>3</sub> )	12055-62-8/ 235-015-3	0.001 (as Ho)
Indium	7440-74-6/ 231-180-0	0.001
Iron	7439-89-6/ 231-096-4	0.001
Lanthanum Oxide (La <sub>2</sub> O <sub>3</sub> )	1312-81-8/ 215-200-5	0.001 (as La)
Lead	7439-92-1/ 231-100-4	0.001
Lithium Carbonate (Li <sub>2</sub> CO <sub>3</sub> )	554-13-2/ 209-062-5	0.001 (as Li)
Lutetium Oxide (Lu <sub>2</sub> O <sub>3</sub> )	12032-20-1/ 234-764-3	0.001 (as Lu)
Magnesium	7439-95-4/ 231-104-6	0.001
Manganese	7439-96-5/ 231-105-1	0.001
Neodymium Oxide (Nd <sub>2</sub> O <sub>3</sub> )	1313-97-9/ 215-214-1	0.001 (as Nd)
Nickel	7440-02-0/ 231-111-4	0.001
Ammonium Dihydrogen Phosphate (NH <sub>4</sub> H <sub>2</sub> PO <sub>4</sub> )	7722-76-1/ 231-764-5	0.001 (as P)
Potassium Nitrate (KNO <sub>3</sub> )	7757-79-1/ 231-818-8	0.001 (as K)
Praseodymium Oxide (Pr <sub>6</sub> O <sub>11</sub> )	12037-29-5/ 234-857-9	0.001 (as Pr)
Rhenium	7440-15-5/ 231-124-5	0.001
Rubidium Carbonate (Rb <sub>2</sub> CO <sub>3</sub> )	584-09-8/ 209-530-9	0.001 (as Rb)
Samarium Oxide (Sm <sub>2</sub> O <sub>3</sub> )	12060-58-1/ 235-043-6	0.001 (as Sm)
Scandium Oxide (Sc <sub>2</sub> O <sub>3</sub> )	12060-08-1/ 235-042-0	0.001 (as Sc)
Selenium	7782-49-2/ 231-957-4	0.001
Sodium Carbonate (Na <sub>2</sub> CO <sub>3</sub> )	497-19-8/ 207-838-8	0.001 (as Na)

<b>Safety Data Sheet No. ICP-MS-68A Solution A</b>	<b>Date: July 12, 2011</b>	
<b>ICP-MS-68A Solution A</b>	<b>Revision: New</b>	<b>Page 3 of 8</b>

Strontium Nitrate (Sr(NO <sub>3</sub> ) <sub>2</sub> )	10042-76-9/233-131-9	0.001 (as Sr)
Terbium Oxide (Tb <sub>4</sub> O <sub>7</sub> )	12037-01-3/ 234-856-3	0.001 (as Tb)
Thallium	7440-28-0/ 231-138-1	0.001
Thorium Oxide (ThO <sub>2</sub> )	1314-20-1/ 215-225-1	0.001 (as Th)
Thulium Oxide (Tm <sub>2</sub> O <sub>3</sub> )	12036-44-1/ 234-851-6	0.001 (as Tm)
Uranium Oxide (U <sub>3</sub> O <sub>8</sub> )	1344-59-8/ 215-702-4	0.001 (as U)
Ammonium Metavanadate (NH <sub>4</sub> VO <sub>3</sub> )	7803-55-6/ 232-261-3	0.001 (as V)
Ytterbium Oxide (Yb <sub>2</sub> O <sub>3</sub> )	1314-37-0/ 215-234-0	0.001 (as Yb)
Yttrium Oxide (Y <sub>2</sub> O <sub>3</sub> )	1314-36-9/ 215-233-5	0.001 (as Y)
Zinc	7440-66-6/ 231-175-3	0.001
Nitric Acid (HNO <sub>3</sub> )	7697-37-2/231-714-2	2
Water, deionized	7732-18-5/231-791-2	Balance

*\*Note: Barium is derived from either Barium carbonate or Barium Nitrate. For this reason both sources are listed on the SDS. Refer to the product's Certificate of Analysis to determine which source was used in the production of the lot number received.*

#### Section 4. First Aid Measures

**IF ON SKIN (or hair):** Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. Call a physician if irritation develops. Liquid may cause burns to skin and eyes. Arsenic compounds increase risk of lung, liver, kidney, and bladder cancer with prolonged exposure. Lead is potentially a human carcinogen.

**IF IN EYES:** Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

**IF SWALLOWED:** Rinse mouth. Do NOT induce vomiting. Call a physician. May cause nausea, vomiting, and diarrhea. Cadmium is a poison that accumulates in the liver and kidneys. Ingestion of arsenic compounds may be poisonous, leading to death.

**IF INHALED:** Remove to fresh air and keep at rest in a position comfortable for breathing.

**IF exposed or concerned:** Get medical attention.

**Target Organs:** Eyes, skin.

#### Section 5. Fire Fighting Measures

Fire & Explosion hazards: While nitric acid is not combustible, it is a strong oxidizing agent that can react with combustible materials; however, it is present in limited quantities in this solution. NO<sub>x</sub> compounds can be released in case of fire.

<b>Safety Data Sheet No. ICP-MS-68A Solution A</b>	<b>Date: July 12, 2011</b>	
<b>ICP-MS-68A Solution A</b>	<b>Revision: New</b>	<b>Page 4 of 8</b>

Extinguishing Media: Use any extinguishing media that is suitable for the surrounding area. Use a water spray to dilute nitric acid and to absorb liberated nitrogen oxides.

Specific Methods: Firefighters should wear proper protective equipment and self-contained breathing apparatus with full face piece operated in positive pressure mode.

#### Section 6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Do not allow to enter drainage systems or water ways. Dike area and dilute spill with water and neutralize with soda ash, limestone, etc. Place the neutralized material into containers suitable for eventual disposal, reclamation, or destruction. Always dispose of in accordance with local regulations.

#### Section 7. Handling and Storage

Store in a cool, dry, ventilated storage area with acid resistant floors and good drainage. Keep out of direct sunlight and away from heat, water, and incompatible materials. When diluting, the acid should always be added slowly to water and in small amounts. Refer to Section 8 for personal handling instructions.

#### Section 8. Exposure Controls and Personal Protection

Engineering Controls: Provide exhaust ventilation or other engineering controls to keep any buildup of airborne contaminants below their respective threshold limit value. Ensure the availability of eyewash stations and safety showers.

Respiratory Protection: Provide approved respiratory apparatus for non-routine or emergency use. Use an approved vapor respirator when the vapor or mist concentrations are high. If necessary, refer to the NIOSH document Guide to the Selection and Use of Particulate Respirators Certified under 42 CFR 84 for selection and use of respirators certified by NIOSH.

Personal Protection: Wear proper gloves, safety glasses with side shields, lab coat/apron.

#### Exposure Limits:

Component	ACGIH TLV	OSHA PEL
Aluminum	10 mg/m <sup>3</sup>	15 mg/m <sup>3</sup>
Arsenic	0.01 mg/m <sup>3</sup>	10 µg/m <sup>3</sup>
Barium	0.5 mg/m <sup>3</sup>	0.5 mg/m <sup>3</sup>
Beryllium Acetate	0.002 mg/m <sup>3</sup>	0.002 mg/m <sup>3</sup>
Bismuth	Not Available	Not Available
Boric Acid	Not Available	Not Available
Calcium Carbonate	0.5 mg/m <sup>3</sup>	0.5 mg/m <sup>3</sup>
Cadmium	0.002 mg/m <sup>3</sup> (respirable particulate)	0.005 mg/m <sup>3</sup>
Cerium Oxide	Not Available	Not Available
Cesium Carbonate	Not Available	Not Available
Chromium	0.5 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>
Cobalt	0.02 mg/m <sup>3</sup>	0.1 mg/m <sup>3</sup>
Copper	0.2 mg/m <sup>3</sup> (fumes)	0.1 mg/m <sup>3</sup> (fumes)
Dysprosium Oxide	Not Available	Not Available

<b>Safety Data Sheet No. ICP-MS-68A Solution A</b>	<b>Date: July 12, 2011</b>	
<b>ICP-MS-68A Solution A</b>	<b>Revision: New</b>	<b>Page 5 of 8</b>

Erbium Oxide	Not Available	Not Available
Europium Oxide	Not Available	Not Available
Gadolinium Oxide	Not Available	Not Available
Gallium	Not Available	Not Available
Holmium Oxide	Not Available	Not Available
Indium	0.05 mg/m <sup>3</sup>	0.05 mg/m <sup>3</sup>
Iron	10 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>
Lanthanum Oxide	Not Available	Not Available
Lead	0.05 mg/m <sup>3</sup>	0.05 mg/m <sup>3</sup>
Lithium Carbonate	Not Available	Not Available
Lutetium Oxide	Not Available	Not Available
Magnesium	Not Available	Not Available
Manganese	0.2 mg/m <sup>3</sup>	C 5 mg/m <sup>3</sup>
Neodymium Oxide	Not Available	Not Available
Nickel	1.5 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>
Ammonium	Not Available	Not Available
Dihydrogen Phosphate		
Potassium Nitrate	Not Available	Not Available
Praseodymium Oxide	Not Available	Not Available
Rhenium	Not Available	Not Available
Rubidium Carbonate	Not Available	Not Available
Samarium Oxide	Not Available	Not Available
Scandium Oxide	Not Available	Not Available
Selenium	0.2 mg/m <sup>3</sup>	0.2 mg/ m <sup>3</sup>
Sodium Carbonate	Not Available	Not Available
Strontium Nitrate	Not Available	Not Available
Terbium Oxide	Not Available	Not Available
Thallium	0.1 mg/m <sup>3</sup>	0.1 mg/m <sup>3</sup>
Thorium Oxide	Not Available	Not Available
Thulium Oxide	Not Available	Not Available
Uranium Oxide	0.2 mg/m <sup>3</sup>	0.05 mg/m <sup>3</sup>
Ammonium Metavanadate	0.05 mg/m <sup>3</sup>	Not Available
Ytterbium Oxide	Not Available	Not Available
Yttrium Oxide	1 mg/m <sup>3</sup>	Not Available
Zinc	5 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>
Nitric Acid (HNO <sub>3</sub> )	2 mg/kg	5 mg/m <sup>3</sup>
Water, deionized	Not Available	Not Available

### Section 9. Physical and Chemical Properties

Physical State: Liquid

Color: Clear, colorless to orange

Odor: Odorless to a faint pungent odor

Odor threshold: None

<b>Safety Data Sheet No. ICP-MS-68A Solution A</b>	<b>Date: July 12, 2011</b>	
<b>ICP-MS-68A Solution A</b>	<b>Revision: New</b>	<b>Page 6 of 8</b>

pH: <2  
Melting point: N/A  
Freezing Point: N/A  
Boiling Point: Approximately 100°C  
Flash point: N/A  
Evaporation rate: N/A  
Flammability: N/A  
Explosion limits: N/A  
Vapor Pressure (mm): N/A  
Vapor Density (air+1): N/A  
Relative density: (H<sub>2</sub>O = 1): Approximately 1.0  
Solubility in H<sub>2</sub>O: Complete  
Auto ignition temperature: N/A  
Decomposition temperature: N/A  
Molecular Weight: N/A

#### Section 10. Stability and Reactivity

Stability Indicator: Decomposes slowly to release oxygen.  
Conditions to Avoid: Metals, chlorine, organic materials, strong alkali, cyanides.  
Incompatibles: Strong reducing agents.  
Hazardous Decomposition Products: NO<sub>x</sub> compounds including nitric oxide (NO), nitrogen dioxide (NO<sub>2</sub>), nitrous oxide (N<sub>2</sub>O) and nitric acid mist or vapor.  
Hazardous Polymerization: Will not occur.

#### Section 11. Toxicological Information

May affect skin, mucous membranes and eyes. Swallowing may lead to a negative effect on mouth and throat and to the risk of perforation or the corrosion of esophagus and stomach. This solution contains natural radioactive thorium oxide and uranium oxide at 0.001% concentration. Both are weakly radioactive and emits alpha particles which are harmful to the body. For the energy range of alpha particles usually encountered, a fraction of a millimeter of any ordinary material is sufficient for absorbance. Thin rubber, acrylic, stout paper, or cardboard will suffice.

##### RTECS#

HNO <sub>3</sub> - QU5775000	Al - BD0330000
As - CG0525000	H <sub>3</sub> BO <sub>3</sub> - ED4560000
BaCO <sub>3</sub> - CQ8600000	Be <sub>4</sub> O(C <sub>2</sub> H <sub>3</sub> O <sub>2</sub> ) <sub>6</sub> - DS2900000
Bi - EB2600000	CaCO <sub>3</sub> - FF9335000
Cd - EU9800000	CeO <sub>2</sub> - FK6310000
Co - GF8750000	Cr - GB4200000
Cs <sub>2</sub> CO <sub>3</sub> - FK9400000	Cu - GL5325000
Dy <sub>2</sub> O <sub>3</sub> - JW1060000	Er <sub>2</sub> O <sub>3</sub> - KD9250000
Eu <sub>2</sub> O <sub>3</sub> - LE8053000	Gd <sub>2</sub> O <sub>3</sub> - LW4790000
Ga - LW8600000	In - NL105000
Fe - NO4565500	KNO <sub>3</sub> - TT3700000
La <sub>2</sub> O <sub>3</sub> - OE5330000	Li <sub>2</sub> CO <sub>3</sub> - OJ5800000
Mg - OM2100000	Mn - OO9275000
Nd <sub>2</sub> O <sub>3</sub> - QP0185000	Na <sub>2</sub> CO <sub>3</sub> - VZ4050000

<b>Safety Data Sheet No. ICP-MS-68A Solution A</b>	<b>Date: July 12, 2011</b>	
<b>ICP-MS-68A Solution A</b>	<b>Revision: New</b>	<b>Page 7 of 8</b>

Ni - QR5950000	Pr <sub>6</sub> O <sub>11</sub> - TU1480000
Pb - OF7525000	Rb <sub>2</sub> CO <sub>3</sub> - FG0650000
Sm <sub>2</sub> O <sub>3</sub> - VP3153000	Se - VS7700000
Sr(NO <sub>3</sub> ) <sub>2</sub> WK9800000	ThO <sub>2</sub> - XO6950000
Tl- XG3425000	U <sub>8</sub> O <sub>3</sub> - YR3490000
NH <sub>4</sub> VO <sub>3</sub> - YW0875000	Y <sub>2</sub> O <sub>3</sub> - ZG3850000
Zn - ZG8600000	Ba(NO <sub>3</sub> ) <sub>2</sub> - CQ9625000

LD<sub>10</sub> Oral, Human: (Nitric Acid) 430 mg/kg  
LD<sub>50</sub> Oral, Rat: (Aluminum) >5000 mg/kg  
LD<sub>50</sub>, Oral, Rat: (Arsenic) 763 mg/kg  
LD<sub>50</sub> Oral, Rat: (Boric Acid) 2660 mg/kg  
LD<sub>10</sub> Oral, Human: (Barium Carbonate) 17 mg/kg  
LD<sub>50</sub> Oral, Rat: (Ba(NO<sub>3</sub>)<sub>2</sub>) 355 mg/kg.  
TD<sub>10</sub> Intratracheal, Rat: (Beryllium Acetate) 13 mg/kg  
LD<sub>50</sub> Oral, Rat: (Bismuth) 5 g/kg  
LD<sub>10</sub> Oral, Human: (Cadmium) 2330 mg/kg  
LD<sub>10</sub> Oral, Rabbit: (Cobalt) 750 mg/kg  
LD<sub>50</sub> Unreported Route, Rat: (Chromium) 27.5 mg/kg  
TD<sub>10</sub> Oral, Human: (Copper) 120 µg/kg  
LD<sub>50</sub> Oral, Rat: (Cesium Carbonate) 2333 mg/kg  
LD<sub>10</sub> Subcutaneous, Mouse: (Indium) 10mg/kg  
LD<sub>50</sub> Oral, Rat: (Potassium Nitrate) 3750 mg/kg  
LD<sub>50</sub> Oral, Rat: (Lanthanum Oxide) >9968 mg/kg  
LD<sub>50</sub> Oral, Rat: (Lithium Carbonate) 525 mg/kg  
LD<sub>50</sub> Oral, Rat: (Manganese) 9 g/kg  
LD<sub>50</sub>, Oral, Mouse: (Sodium Carbonate) 6600 mg/kg  
LD<sub>50</sub>, Intravenous, Mouse: (Nickel) 50 mg/kg  
TD<sub>50</sub> Oral, Woman: (Lead) 450 mg/kg/6 years  
LD<sub>50</sub>, Oral, Rat: (Selenium) 6700 mg/kg  
TD<sub>10</sub> Oral, Man: (Thallium) 5,714 µg/kg  
TD<sub>10</sub> Intraarterial, Human: (Thorium Oxide) 490 mg/kg  
TD<sub>50</sub> Unreported Route, Rat: (Uranium Oxide) 750 mg/kg  
LD<sub>10</sub> Oral, Mouse: (Yttrium) >6 g/kg  
LD<sub>10</sub> Oral, Duck: (Zinc) 388 mg/kg.

#### Section 12. Ecological Information

Ecotoxicological information: Do not allow material to reach ground water, water bodies, or sewage system. Beryllium and its compounds are considered to have high acute and chronic toxicity to aquatic life. Beryllium is more toxic in soft water than in hard water.

#### Section 13. Disposal Considerations

General: Follow Federal, state and local regulations for waste.

#### Section 14. Transport Information

<b>Safety Data Sheet No. ICP-MS-68A Solution A</b>	<b>Date: July 12, 2011</b>	
<b>ICP-MS-68A Solution A</b>	<b>Revision: New</b>	<b>Page 8 of 8</b>

D.O.T. Classification: Hazardous by IATA and 49CFR regulations (based on concentration of acid).

D.O.T. Shipping Name: Corrosive liquid, Acidic, Inorganic, n.o.s. (Nitric Acid Solution)

D.O.T. Hazard Class: 8

U.N./N.A. Number: 3264

Packing Group: II

D.O.T. Label: Corrosive (8)

#### Section 15. Regulations (Not meant to be all inclusive-selected regulation listed)

TSCA Status: Components of this solution are listed on the TSCA Inventory.

RCRA Status: Yes (Ammonium metavanadate-P119 )

SARA: Subject to the reporting requirements of Section 313 or SARA Title III and of 40 CFR 372

Risk Phrases: R20/21/22, R45 Harmful by inhalation, skin contact, or if swallowed. May cause cancer.

Safety Phrases: S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

WHMIS Information (Canada): E: Corrosive

ICP-MS-68A, Solution A contains a limited quantity radioactive material that is exempt from radioactive labeling requirements under 49CFR section 173.421. The massic activity of ICP-MS-68A Solution A is less than 40 Bq/g.

#### Section 16. Other Information

HPS products are intended for laboratory use only. All products should be handled and used by trained professional personnel only. The responsibility for the safe handling and use of these products rests solely with the buyer and/or user. The SDS was prepared carefully and represents the best data currently available to us; however, HPS does not certify the data on the SDS.

Certified values for this material are given only on the Certificate of Analysis.

Theodore C. Rains, Ph.D.