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 1
Serious Eye Damage/ Eye Irritation, Category 1
Labeling:

Symbol:
Signal Word: Danger.
Hazard Statement: Causes severe skin burns and eye damage.
Precautionary Statement: Wear protective gloves/clothing and eye/face protection. Wash thoroughly after handling.

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 ($BaCO_3$)	513-77-9/ 208-167-3	0.001 (as Ba)
Barium Nitrate ($Ba(NO_3)_2$)	10022-31-8/233-020-5	
Beryllium Acetate ($Be_4O(C_2H_3O_2)_6$)	19049-40-2/ 242-785-4	0.001 (as Be)
Bismuth	7440-69-9/ 231-177-4	0.001
Boric Acid (H_3BO_3)	10043-35-3/ 233-139-2	0.001 (as B)
Calcium Carbonate ($CaCO_3$)	471-34-1/ 207-439-9	0.001 (as Ca)
Cadmium	7440-43-9/ 231-152-8	0.001
Cerium Oxide (CeO_2)	1306-38-3/ 215-150-4	0.001 (as Ce)
Cesium Carbonate (Cs_2CO_3)	534-17-8 / 208-591-9	0.001 (as Cs)
Chromium	7440-47-3/ 231-157-5	0.001
Cobalt	7440-48-4/ 231-158-0	0.001

Copper	7440-50-8/ 231-159-6	0.001
Dysprosium Oxide (Dy_2O_3)	1308-87-8/ 215-164-0	0.001 (as Dy)
Erbium Oxide (Er_2O_3)	12061-16-4/ 235-045-7	0.001 (as Er)
Europium Oxide (Eu_2O_3)	1308-96-9/ 215-165-6	0.001 (as Eu)
Gadolinium Oxide (Gd_2O_3)	12064-62-9/ 235-060-9	0.001 (as Gd)
Gallium	7440-55-3/ 231-163-8	0.001
Holmium Oxide (Ho_2O_3)	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_2O_3)	1312-81-8/ 215-200-5	0.001 (as La)
Lead	7439-92-1/ 231-100-4	0.001
Lithium Carbonate (Li_2CO_3)	554-13-2/ 209-062-5	0.001 (as Li)
Lutetium Oxide (Lu_2O_3)	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_2O_3)	1313-97-9/ 215-214-1	0.001 (as Nd)
Nickel	7440-02-0/ 231-111-4	0.001
Ammonium Dihydrogen Phosphate ($NH_4H_2PO_4$)	7722-76-1/ 231-764-5	0.001 (as P)
Potassium Nitrate (KNO_3)	7757-79-1/ 231-818-8	0.001 (as K)
Praseodymium Oxide (Pr_6O_{11})	12037-29-5/ 234-857-9	0.001 (as Pr)
Rhenium	7440-15-5/ 231-124-5	0.001
Rubidium Carbonate (Rb_2CO_3)	584-09-8/ 209-530-9	0.001 (as Rb)
Samarium Oxide (Sm_2O_3)	12060-58-1/ 235-043-6	0.001 (as Sm)
Scandium Oxide (Sc_2O_3)	12060-08-1/ 235-042-0	0.001 (as Sc)
Selenium	7782-49-2/ 231-957-4	0.001
Sodium Carbonate (Na_2CO_3)	497-19-8/ 207-838-8	0.001 (as Na)
Strontium Nitrate ($Sr(NO_3)_2$)	10042-76-9/233-131-9	0.001 (as Sr)

Terbium Oxide (Tb_4O_7)	12037-01-3/ 234-856-3	0.001 (as Tb)
Thallium	7440-28-0/ 231-138-1	0.001
Thorium Oxide (ThO_2)	1314-20-1/ 215-225-1	0.001 (as Th)
Thulium Oxide (Tm_2O_3)	12036-44-1/ 234-851-6	0.001 (as Tm)
Uranium Oxide (U_3O_8)	1344-59-8/ 215-702-4	0.001 (as U)
Ammonium Metavanadate (NH_4VO_3)	7803-55-6/ 232-261-3	0.001 (as V)
Ytterbium Oxide (Yb_2O_3)	1314-37-0/ 215-234-0	0.001 (as Yb)
Yttrium Oxide (Y_2O_3)	1314-36-9/ 215-233-5	0.001 (as Y)
Zinc	7440-66-6/ 231-175-3	0.001
Nitric Acid (HNO_3)	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.

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.

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

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_x compounds can be released in case of fire.

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.

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

Exposure Limits:

Component	ACGIH TLV	OSHA PEL
Aluminum	10 mg/m^3	15 mg/m^3
Arsenic	0.01 mg/m^3	10 $\mu g/ m^3$
Barium	0.5 mg/m^3	0.5 mg/m^3
Beryllium Acetate	0.002 mg/m^3	0.002 mg/m^3
Bismuth	Not Available	Not Available
Boric Acid	Not Available	Not Available
Calcium Carbonate	0.5 mg/m^3	0.5 mg/m^3
Cadmium	0.002 mg/m^3 (respirable particulate)	0.005 mg/m^3
Cerium Oxide	Not Available	Not Available
Cesium Carbonate	Not Available	Not Available
Chromium	0.5 mg/m^3	1 mg/m^3
Cobalt	0.02 mg/m^3	0.1 mg/m^3
Copper	0.2 mg/m^3 (fumes)	0.1 mg/m^3 (fumes)
Dysprosium Oxide	Not Available	Not Available
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^3	0.05 mg/m^3
Iron	10 mg/m^3	5 mg/m^3
Lanthanum Oxide	Not Available	Not Available
Lead	0.05 mg/m^3	0.05 mg/m^3
Lithium Carbonate	Not Available	Not Available
Lutetium Oxide	Not Available	Not Available
Magnesium	Not Available	Not Available

Manganese	0.2 mg/m^3	C 5 mg/m^3
Neodymium Oxide	Not Available	Not Available
Nickel	1.5 mg/m^3	1 mg/m^3
Ammonium Dihydrogen Phosphate	Not Available	Not Available
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^3	0.2 mg/ m^3
Sodium Carbonate	Not Available	Not Available
Strontium Nitrate	Not Available	Not Available
Terbium Oxide	Not Available	Not Available
Thallium	0.1 mg/m^3	0.1 mg/m^3
Thorium Oxide	Not Available	Not Available
Thulium Oxide	Not Available	Not Available
Uranium Oxide	0.2 mg/m^3	0.05 mg/m^3
Ammonium Metavanadate	0.05 mg/m^3	Not Available
Ytterbium Oxide	Not Available	Not Available
Yttrium Oxide	1 mg/m^3	Not Available
Zinc	5 mg/m^3	1 mg/m^3
Nitric Acid (HNO_3)	2 mg/kg	5 mg/m^3
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
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_2O = 1): Approximately 1.0
Solubility in H_2O: 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_x compounds including nitric oxide (NO), nitrogen dioxide (NO_2), nitrous oxide (N_2O) 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_3 - QU5775000
As - CG0525000
$BaCO_3$ - CQ8600000
Bi - EB2600000
Cd - EU9800000
Co - GF8750000
Cs_2CO_3 - FK9400000
Dy_2O_3 - JW1060000
Eu_2O_3 – LE8053000
Ga – LW8600000
Fe – NO4565500
La_2O_3 - OE5330000
Mg – OM2100000
Nd_2O_3 - QP0185000
Ni - QR5950000
Pb - OF7525000
Sm_2O_3 - VP3153000
$Sr(NO_3)_2$ WK9800000
Tl- XG3425000
NH_4VO_3 – YW0875000
Zn - ZG8600000

Al - BD0330000
H_3BO_3 - ED4560000
$Be_4O(C_2H_3O_2)_6$ – DS2900000
$CaCO_3$ – FF9335000
CeO_2 – FK6310000
Cr - GB4200000
Cu - GL5325000
Er_2O_3 – KD9250000
Gd_2O_3 – LW4790000
In - NL105000
KNO_3 - TT3700000
Li_2CO_3 - OJ5800000
Mn - OO9275000
Na_2CO_3 - VZ4050000
Pr_6O_{11} - TU1480000
Rb_2CO_3 - FG0650000
Se - VS7700000
ThO_2 - XO6950000
U_8O_3 - YR3490000
Y_2O_3 - ZG3850000
$Ba(NO_3)_2$- CQ9625000

LD_{LO} Oral, Human: (Nitric Acid) 430 mg/kg
LD_{50} Oral, Rat: (Aluminum) >5000 mg/kg
LD_{50}, Oral, Rat: (Arsenic) 763 mg/kg
LD_{50} Oral, Rat: (Boric Acid) 2660 mg/kg

LD_{LO} Oral, Human: (Barium Carbonate) 17 mg/kg
LD_{50} Oral, Rat: ($Ba(NO_3)_2$) 355 mg/kg.
TD_{LO} Intratracheal, Rat: (Beryllium Acetate) 13 mg/kg
LD_{50} Oral, Rat: (Bismuth) 5 g/kg
LD_{LO} Oral, Human: (Cadmium) 2330 mg/kg
LD_{LO} Oral, Rabbit: (Cobalt) 750 mg/kg
LD_{50} Unreported Route, Rat: (Chromium) 27.5 mg/kg
TD_{LO} Oral, Human: (Copper) 120 μg/kg
LD_{50} Oral, Rat: (Cesium Carbonate) 2333 mg/kg
LD_{LO} Subcutaneous, Mouse: (Indium) 10mg/kg
LD_{50} Oral, Rat: (Potassium Nitrate) 3750 mg/kg
LD_{50} Oral, Rat: (Lanthanum Oxide) >9968 mg/kg
LD_{50} Oral, Rat: (Lithium Carbonate) 525 mg/kg
LD_{50} Oral, Rat: (Manganese) 9 g/kg
LD_{50}, Oral, Mouse: (Sodium Carbonate) 6600 mg/kg
LD_{50}, Intravenous, Mouse: (Nickel) 50 mg/kg
TD_{50} Oral, Woman: (Lead) 450 mg/kg/6 years
LD_{50}, Oral, Rat: (Selenium) 6700 mg/kg
TD_{LO} Oral, Man: (Thallium) 5,714 μg/kg
TD_{LO} Intraarterial, Human: (Thorium Oxide) 490 mg/kg
TD_{50} Unreported Route, Rat: (Uranium Oxide) 750 mg/kg
LD_{LO} Oral, Mouse: (Yttrium) >6 g/kg
LD_{LO} 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

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 mass 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.