

## Section 1. Product and Company Identification

Product Identification: ICP-MSCS  
 MSDS Number: ICP-MSCS  
 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.

**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
Antimony	7440-36-0/231-146-5	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)
Boric Acid (H <sub>3</sub> BO <sub>3</sub> )	10043-35-3/233-139-2	0.001 (as B)
Cadmium	7440-43-9/231-152-8	0.001
Calcium Carbonate (CaCO <sub>3</sub> )	471-34-1/207-439-9	0.001 (as Ca)
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
Europium Oxide (Eu <sub>2</sub> O <sub>3</sub> )	1308-96-9/215-165-6	0.001 (as Eu)

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Holmium Oxide (Ho <sub>2</sub> O <sub>3</sub> )	12055-62-8/235-015-3	0.001 (as Ho)
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)
Magnesium	7439-95-4/231-104-6	0.001
Manganese Acetate Tetrahydrate (Mn(CH <sub>3</sub> CO <sub>2</sub> ) <sub>2</sub> )*4H <sub>2</sub> O	6156-78-1/211-334-3	0.001 (as Mn)
Molybdenum	7439-98-7/231-107-2	0.001
Nickel	7440-02-0/231-111-4	0.001
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
Silver	7440-22-4/231-131-3	0.001
Sodium Carbonate (Na <sub>2</sub> CO <sub>3</sub> )	497-19-8/207-838-8	0.001 (as Na)
Strontium Nitrate (Sr(NO <sub>3</sub> ) <sub>2</sub> )	10042-76-9/233-131-9	0.001 (as Sr)
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)
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)
Zinc	7440-66-6/231-175-3	0.001
Nitric Acid	7697-37-2/ 231-714-2	2
Hydrofluoric Acid	7664-39-3/231-634-8	0.05
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. Gently wash with plenty of soap and water. Rub calcium gluconate gel immediately to skin. Obtain medical assistance. Wash contaminated clothing before reuse.

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**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/physician.

**IF SWALLOWED:** Rinse mouth. Do NOT induce vomiting.

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

**Target Organs:** Eyes, skin, respiratory system, teeth, and skeletal system.

#### 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. Hydrofluoric acid may ignite or explode on contact with combustible materials.

**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 appropriate gloves impermeable to HF, safety glasses with face shield, and lab coat/apron to avoid any direct skin contact.

#### Exposure Limits:

Component	ACGIH TLV	OSHA PEL
Aluminum	10 mg/m <sup>3</sup>	15 mg/m <sup>3</sup>
Antimony	0.5 mg/m <sup>3</sup>	0.5 mg/m <sup>3</sup>
Arsenic	0.01 mg/m <sup>3</sup>	10 µg/ m <sup>3</sup>

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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>
Boric Acid	Not Available	Not Available
Cadmium	0.002 mg/m <sup>3</sup> (respirable particulate)	0.005 mg/m <sup>3</sup>
Calcium Carbonate	0.5 mg/m <sup>3</sup>	0.5 mg/m <sup>3</sup>
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)
Europium Oxide	Not Available	Not Available
Holmium Oxide	Not Available	Not Available
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
Magnesium	Not Available	Not Available
Manganese Acetate Tetrahydrate	0.2 mg/m <sup>3</sup>	C 5 mg/m <sup>3</sup>
Molybdenum	5 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>
Nickel	1.5 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>
Scandium Oxide	Not Available	Not Available
Selenium	0.2 mg/m <sup>3</sup>	0.2 mg/m <sup>3</sup>
Silver	0.1 mg/m <sup>3</sup>	Not Available
Sodium Carbonate	Not Available	Not Available
Strontium Nitrate	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
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
Zinc	5 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>
Nitric Acid	2 mg/kg	5 mg/m <sup>3</sup>
Hydrofluoric Acid	C: 3 mg/ml	2.5 mg/m <sup>3</sup> STEL: 6 mg/ml

### Section 9. Physical and Chemical Properties

Physical State: Liquid  
Color: Clear, colorless  
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

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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: YES  
Conditions to Avoid: Avoid heat and contact with combustible and other incompatible materials.  
Incompatibles: Strong reducing agents, metallic powders, strong bases, chlorine, calcium compounds, hydroxides, organic materials, strong alkali, cyanides.  
Hazardous Decomposition Products: HF and 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 depleted radioactive thorium oxide and uranium oxide at 0.001% concentration. Thorium oxide and uranium oxide are weakly radioactive and emit 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	HF- MW7875000
Al - BD0330000	As - CG0525000
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
H <sub>3</sub> BO <sub>3</sub> - ED450000	CaCO <sub>3</sub> – FF9335000
Cd - EU9800000	Co- GF8750000
Cr-GB4200000	Cu - GL5325000
Eu <sub>2</sub> O <sub>3</sub> LE8053000	La <sub>2</sub> O <sub>3</sub> - OE5330000
Pb – OF7525000	Li <sub>2</sub> CO <sub>3</sub> – OJ5800000
Mg – FW6475100	Mn - AI5775000
Mo- QA4680000	Ni- QR5950000
Se - VS7700000	Ag- VW3500000
Na <sub>2</sub> CO <sub>3</sub> - VZ4050000	Sr(NO <sub>3</sub> ) <sub>2</sub> – WK9800000
Sb - CC4025000	Tl – XG3425000
ThO <sub>2</sub> - XO6950000	NH <sub>4</sub> VO <sub>3</sub> - YW0875000
Zn - ZG8600000	Ba(NO <sub>3</sub> ) <sub>2</sub> - CQ9625000

**Toxicity Data:**

LD<sub>LO</sub> Oral, Human: (Nitric Acid) 430 mg/kg  
LC<sub>LO</sub> Inhalation, Human: (Hydrofluoric Acid) 50 mg/kg/30 min  
LD<sub>50</sub> Oral, Rat: (Aluminum) >5000 mg/kg  
LD<sub>50</sub> Oral, Rat: (Antimony) 7g/kg

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LD<sub>50</sub>, Oral, Rat: (Arsenic) 763 mg/kg  
LD<sub>LO</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>LO</sub> Intratracheal, Rat: (Beryllium Acetate) 13 mg/kg  
LD<sub>50</sub> Oral, Rat: (Boric Acid) 2660 mg/kg; LD<sub>LO</sub>, Oral, Woman: (Boric Acid) 400 mg/kg,  
behavioral and gastrointestinal effects noted  
LD<sub>LO</sub> Oral, Human: (Cadmium) 2330 mg/kg  
LD<sub>50</sub> Unreported Route, Rat: (Chromium) 27.5 mg/kg  
LD<sub>LO</sub> Oral, Rabbit: (Cobalt) 750 mg/kg  
TD<sub>LO</sub> Oral, Human: (Copper) 120 µg/kg  
LD<sub>50</sub> Oral, Rat: (Europium Oxide) 5g/kg  
LD<sub>50</sub> Oral, Rat: (Lanthanum Oxide) >9968 mg/kg  
LD<sub>50</sub> Oral, Rat: (Lithium Carbonate) 525 mg/kg  
TD<sub>50</sub> Oral, Woman: (Lead) 450 mg/kg/6 year  
LD<sub>50</sub> Oral, Rat: (Manganese) 3730mg/kg  
TD<sub>LO</sub> Oral, Mouse: (Molybdenum) 448 mg/kg (multigenerations)  
LD<sub>50</sub>, Intravenous, Mouse: (Nickel) 50 mg/kg  
LD<sub>50</sub>, Oral, Rat: (Selenium) 6700 mg/kg  
TD<sub>LO</sub> Implant; TD<sub>LO</sub> Implant, Mouse: (Silver) 11 g/kg  
LD<sub>50</sub>, Oral, Mouse: (Sodium Carbonate) 6600 mg/kg  
TD<sub>LO</sub> Oral, Man: (Thallium) 5,714 µg/kg  
TD<sub>LO</sub> Intraarterial, Human: (Thorium Oxide) 490 mg/kg  
TD<sub>50</sub> Unreported Route, Rat: (Uranium Oxide) 750 mg/kg  
LD<sub>50</sub> Oral, Rat: (Ammonium Metavanadate) 58,100 µg/kg  
LD<sub>LO</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. High concentrations of zinc have been shown to be detrimental to aquatic life. 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 (Hydrofluoric Acid-U134), Ammonium metavanadate (P119)

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

Risk Phrases: R20/21/22. R24/25. R34. R45. R48. Harmful by inhalation, skin contact, or ingestion. Toxic in contact with the skin and ingestion. Cause burns. May cause cancer. Danger of serious damage to health by prolonged exposure. Danger of cumulative effects.

Safety Phrases: S24, S25, S36/37/39, S53 Avoid contact with the skin. Avoid contact with eyes. Wear suitable protective clothing, gloves and eye/face protection; Avoid exposure-obtain special instruction before use.

WHMIS Information (Canada): E: Corrosive

ICP-MSCS contains a limited quantity radioactive material that is exempt from radioactive labeling requirements under 49CFR section 173.421. The massic activity of ICP-MSCS is less than 500 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.