Section 1. Product and Company Identification

Product Identification:	ICP-MS-ICS Solution AB
MSDS Number:	ICP-MS-ICS Solution AB
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	0.05
Ammonium Acetate ($NH_4C_2H_3O_2$)	631-61-8/211-162-9	0.1 (as C)
Ammonium Chloride (NH_4Cl)	12125-02-9/235-186-4	0.36 (as Cl)
Arsenic	7440-38-2/231-148-6	<0.001
Calcium Carbonate ($CaCO_3$)	471-34-1/207-439-9	0.05 (as Ca)
Cadmium	7440-43-9/231-152-8	<0.001
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
Iron	7439-89-6/231-096-4	0.05
Magnesium Nitrate ($Mg(NO_3)_2$)	10377-60-3/233-826-7	0.5 (as Mg)
Manganese Acetate Tetrahydrate $(Mn(CH_3CO_2)_2)*4H_2O$	6156-78-1/211-334-3	0.1 (as Mn)

Molybdenum	7439-98-7/231-107-2	0.001
Nickel	7440-02-0/231-111-4	<0.001
Ammonium Dihydrogen Phosphate ($NH_4H_2PO_4$)	7722-76-1/231-764-5	0.05 (as P)
Potassium Nitrate (KNO_3)	7757-79-1/231-818-8	0.05 (as K)
Selenium	7782-49-2/231-957-4	<0.001
Silver	7440-22-4/231-131-3	<0.001
Sodium Carbonate (Na_2CO_3)	497-19-8/207-838-8	0.05 (as Na)
Sulfuric Acid (H_2SO_4)	7664-93-9/231-639-5	0.05 (as S)
Titanium	7440-32-6/231-142-3	0.001
Ammonium Metavanadate (NH_4VO_3)	7803-55-6/232-261-3	<0.001 (as V)
Zinc	7440-66-6/231-175-3	<0.001
Nitric Acid (HNO_3)	7697-37-2/ 231-714-2	2
Hydrofluoric Acid (HF)	7664-39-3/231-634-8	<0.001
Water, deionized	7732-18-5/ 231-791-2	Balance

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.

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_x 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^3	15 mg/m^3
Ammonium Acetate	20 mg/m^3	Not Available
Ammonium Chloride	10 mg/m^3	10 mg/m^3
Arsenic	0.01 mg/m^3	10 µg/ m^3
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
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)
Iron	10 mg/m^3	5 mg/m^3
Magnesium Nitrate	Not Available	Not Available
Manganese Acetate Tetrahydrate	0.2 mg/m^3	C 5 mg/m^3

Molybdenum	5 mg/m^3	5 mg/m^3
Nickel	1.5 mg/m^3	1 mg/m^3
Ammonium Dihydrogen Phosphate	Not Available	Not Available
Potassium Nitrate	Not Available	Not Available
Selenium	0.2 mg/m^3	0.2 mg/ m^3
Silver	0.1 mg/m^3	Not Available
Sodium Carbonate	Not Available	Not Available
Sulfuric Acid	5 mg/m^3	1 mg/m^3
Titanium	Not Available	Not Available
Ammonium Metavanadate	0.05 mg/m^3	Not Available
Zinc	5 mg/m^3	1 mg/m^3
Nitric Acid	2 mg/kg	5 mg/m^3
Hydrofluoric Acid	C: 3 mg/ml	2.5 mg/m^3 STEL: 6 mg/ml

Section 9. Physical and Chemical Properties

Physical State: Liquid
Color: pale yellow
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: 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_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.

Cadmium, Cobalt, and Nickel are known or investigated as possible carcinogenic substances.

RTECS#

HNO_3 - QU5775000
H_2SO_4-WS5600000
$NH_4C_2H_3O_2$ - AF3675000
Ag - VW3500000
$CaCO_3$ - EV9580000
Co - GF8750000
Cu - GL5325000
Mo - QA4680000
Mn - AI5775000
Ni - QR5950000
Zn - ZG8600000
HF - MW7875000
Al - BD0330000
NH_4Cl – BP4550000
As - CG0525000
Cd - EU9800000
Cr - GB4200000
KNO_3 - TT3700000
$Mg(NO_3)_2$: OM3750000
Na_2CO_3 - VZ4050000
Se - VS7700000
NH_4VO_3- YW0875000

Toxicity Data:

LD_{LO} Oral, Human: (Nitric Acid) 430 mg/kg
LC_{LO} Inhalation, Human: (Hydrofluoric Acid) 50 mg/kg/30 min
LD_{50} Oral, Rat: (Sulfuric Acid) 2140 mg/kg
LD_{50} Oral, Rat: (Aluminum) >5000 mg/kg
LD_{50} lpr, Rat (Ammonium Acetate) 632 mg/kg
LD_{50}, Oral, Rat: (Arsenic) 763 mg/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: (Potassium Nitrate) 3750 mg/kg
TD_{LO} Oral, Mouse: (Molybdenum) 448 mg/kg (multigenerations)
LD_{50} Oral, Rat: (Magnesium Nitrate) 5440 mg/kg
LD_{50} Oral, Rat: (Manganese) 3730mg/kg
LD_{50}, Oral, Mouse: (Sodium Carbonate) 6600 mg/kg
LD_{50}, Intravenous, Mouse: (Nickel) 50 mg/kg
LD_{50}, Oral, Rat: (Selenium) 6700 mg/kg
LD_{LO} Oral, Duck: (Zn) 388 mg/kg.

Section 12. Ecological Information

Ecotoxicological information: Do not allow material to reach ground water, water bodies, or sewage system. Concentrated sulfuric acid has moderate acute and chronic effects to aquatic life; however, the concentration in this product is dilute.

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 (HF– U134), 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 Harmful by inhalation, skin contact, or if ingested.
Safety Phrases: S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
WHMIS Information (Canada): E: Corrosive

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.