

Safety Data Sheet

Section 1. Product and Company Identification

Product Identification: QCS-1 Solution A
 MSDS Number: QCS-1 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	0.01
Arsenic	7440-38-2/231-148-6	0.01
Barium Nitrate (Ba(NO ₃) ₂)	10022-31-8/233-020-5	0.01 (as Ba)
Barium Carbonate (BaCO ₃)	513-77-9/208-167-3	
Beryllium Acetate (Be ₄ O(C ₂ H ₃ O ₂) ₆)	19049-40-2/242-785-4	0.01 (as Be)
Boric Acid (H ₃ BO ₃)	10043-35-3/233-139-2	0.01 (as B)
Calcium Carbonate (CaCO ₃)	471-34-1/207-439-9	0.01 (as Ca)
Cadmium	7440-43-9/231-152-8	0.01
Chromium	7440-47-3/231-157-5	0.01
Cobalt	7440-48-4/231-158-0	0.01
Copper	7440-50-8/231-159-6	0.01
Iron	7439-89-6/231-096-4	0.01
Lithium Carbonate (Li ₂ CO ₃)	554-13-2/209-062-5	0.01 (as Li)

Safety Data Sheet No. QCS-1 Solution A	Date: April 18, 2014	
QCS-1 Solution A	Revision: 001	Page 2 of 6

Magnesium	7439-95-4/231-104-6	0.01
Manganese Acetate Tetrahydrate (Mn(CH ₃ CO ₂) ₂)*4H ₂ O	6156-78-1/211-334-3	0.01
Molybdenum	7439-98-7/231-107-2	0.01
Nickel	7440-02-0/231-111-4	0.01
Ammonium Dihydrogen Phosphate (NH ₄ H ₂ PO ₄)	7722-76-1/231-764-5	0.01 (as P)
Potassium Nitrate (KNO ₃)	7757-79-1/231-818-8	0.01 (as K)
Selenium	7782-49-2/231-957-4	0.01
Ammonium Hexafluorosilicate (NH ₄) ₂ SiF ₆	16919-19-0/240-968-3	0.01 (as Si)
Uranium Oxide (U ₃ O ₈)	1344-59-8/215-702-4	0.01 (as U)
Ammonium Metavanadate (NH ₄ VO ₃)	7803-55-6/232-261-3	0.01 (as V)
Yttrium Oxide (Y ₂ O ₃)	1314-36-9/215-233-5	0.05 (as Y)
Zinc	7440-66-6/231-175-3	0.01
Nitric Acid (HNO ₃)	7697-37-2/231-714-2	4
Hydrofluoric Acid	7664-39-3/231-634-8	<0.001
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.

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.

Safety Data Sheet No. QCS-1 Solution A	Date: April 18, 2014	
QCS-1 Solution A	Revision: 001	Page 3 of 6

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 µg/ 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
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
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
Lithium Carbonate	Not Available	Not Available
Magnesium	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

Safety Data Sheet No. QCS-1 Solution A	Date: April 18, 2014	
QCS-1 Solution A	Revision: 001	Page 4 of 6

Ammonium Hexafluorosilicate	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
Yttrium Oxide	1 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
Water, deionized	Not Available	Not Available

Section 9. Physical and Chemical Properties

Physical State: Liquid

Color: : Clear, colorless to grey

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: (H₂O = 1): Approximately 1.0

Solubility in H₂O: 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 (NO₂), nitrous oxide (N₂O) 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.

RTECS#

HNO₃ - QU5775000

HF - MW7875000

Safety Data Sheet No. QCS-1 Solution A	Date: April 18, 2014	
QCS-1 Solution A	Revision: 001	Page 5 of 6

Al - BD0330000	As - CG0525000
Ba(NO ₃) ₂ - CQ9625000	Be ₄ O(C ₂ H ₃ O ₂) ₆ - DS2900000
H ₃ BO ₃ - ED450000	CaCO ₃ - FF9335000
Cd - EU9800000	Cr - GB4200000
Co - GF8750000	Cu - GL5325000
Fe - NO4565500	Li ₂ CO ₃ - OJ5800000
Mg - FW6475100	Mn - AI5775000
Mo - QA4680000	Ni - QR5950000
KNO ₃ - TT3700000	Se - VS7700000
U ₃ O ₈ - YO7175000	(NH ₄) ₂ SiF ₆ - VV7800000
NH ₄ VO ₃ - YW0875000	Y ₂ O ₃ - ZG3850000
Zn - ZG8600000	BaCO ₃ ; CQ8600000

Toxicity Data:

LD_{LO} Oral, Human: (Nitric Acid) 430 mg/kg
 LC_{LO} Inhalation, Human: (Hydrofluoric Acid) 50 mg/kg/30 min
 LD₅₀ Oral, Rat: (Aluminum) >5000 mg/kg
 LD₅₀, Oral, Rat: (Arsenic) 763 mg/kg
 LD₅₀ Oral, Rat: (Boric Acid) 2660 mg/kg
 LD₅₀ Oral, Rat: (Barium Nitrate) 355 mg/kg
 LD_{LO} Oral, Human: (Barium Carbonate) 17 mg/kg.
 TD_{LO} Intratracheal, Rat: (Beryllium Acetate) 13 mg/kg
 LD_{LO} Oral, Human: (Cadmium) 2330 mg/kg
 LD_{LO} Oral, Rabbit: (Cobalt) 750 mg/kg
 LD₅₀ Unreported Route, Rat: (Chromium) 27.5 mg/kg
 LD₅₀ Oral, Rat: (Potassium Nitrate) 3750 mg/kg
 LD₅₀ Oral, Rat: (Lithium Carbonate) 525 mg/kg
 LD₅₀ Oral, Rat: (Manganese Acetate) 3730mg/kg
 TD_{LO} Oral, Mouse: (Molybdenum) 448 mg/kg (multigenerations)
 LD₅₀, Intravenous, Mouse: (Nickel) 50 mg/kg
 LD₅₀, Oral, Rat: (Selenium) 6700 mg/kg
 LD_{LO} Oral, Rat: (Ammonium Hexafluorosilicate) 100 mg/kg
 TD₅₀ Unreported Route, Rat: (Uranium Oxide) 750 mg/kg
 LD_{LO} Oral, Mouse: (Yttrium Oxide) >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.
 Biodegradability LC₅₀ 96 hrs fish 3185mg/l; EC₅₀ 96 hrs Daphnia 247 mg/l.

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).

Safety Data Sheet No. QCS-1 Solution A	Date: April 18, 2014	
QCS-1 Solution A	Revision: 001	Page 6 of 6

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)
SARA: Subject to the reporting requirements of Section 313 of SARA Title III and of 40 CFR 372
Risk Phrases: R20/21/22, R24, R25, R34 Harmful by inhalation, skin contact, or if ingested.
Toxic in contact with skin. Toxic if swallowed. Causes burns.
Safety Phrases: S24, S25, S36/37/39 Avoid contact with the skin. Avoid contact with eyes. Wear suitable protective clothing, gloves and eye/face protection
WHMIS Information (Canada): E: Corrosive

QCS-1 Solution A contains a limited quantity radioactive material that is exempt from radioactive labeling requirements under 49CFR section 173.421. The massic activity of QCS-1 Solution A is less than 2.6kBq.

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.