Section 1. Product and Company Identification

Product Identification: QCS-21
MSDS Number: QCS-21
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
Antimony	7440-36-0/231-146-5	0.01
Arsenic	7440-38-2/231-148-6	0.01
Beryllium Acetate ($Be_4O(C_2H_3O_2)_6$)	19049-40-2/242-785-4	0.01 (as Be)
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
Lead	7439-92-1/231-100-4	0.01
Lithium Carbonate (Li_2CO_3)	554-13-2/209-062-5	0.01 (as Li)
Magnesium	7439-95-4/231-104-6	0.01
Manganese	7439-96-5/231-105-1	0.01

Molybdenum	7439-98-7/231-107-2	0.01
Nickel	7440-02-0/231-111-4	0.01
Selenium	7782-49-2/231-957-4	0.01
Strontium Nitrate ($Sr(NO_3)_2$)	10042-76-9/233-131-9	0.01 (as Sr)
Thallium	7440-28-0/231-138-1	0.01
Titanium	7440-32-6/231-142-3	0.01
Ammonium Metavanadate (NH_4VO_3)	7803-55-6/232-261-3	0.01 (as V)
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	0.1
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.

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

Exposure Limits:

Component	ACGIH TLV	OSHA PEL
Antimony	0.5 mg/m^3	0.5 mg/m^3
Arsenic	0.01 mg/m^3	10 µg/ m^3
Beryllium Acetate	0.002 mg/m^3	0.002 mg/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
Lead	0.05 mg/m^3	0.05 mg/m^3
Lithium Carbonate	Not Available	Not Available
Magnesium	Not Available	Not Available
Manganese	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
Selenium	0.2 mg/m^3	0.2 mg/ m^3
Strontium Nitrate	Not Available	Not Available
Thallium	0.1 mg/m^3	0.1 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
Water, deionized	Not Available	Not Available

Section 9. Physical and Chemical Properties

Physical State: Liquid

Color: Clear, light gray

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.

RTECS#

HNO_3- QU5775000
HF- MW7875000
Sb- CC4025000
As- CG0525000
$Be_4O(C_2H_3O_2)_6$ – DS29750000
$CaCO_3$-EV9580000
Cd-EU9800000
Cr-GB4200000
Co- GF8750000
Cu- GL5325000
Pb- OF7525000
Li_2CO_3 - OJ5800000
Mn- OO9275000
Mo- QA4680000
Ni- QR5950000
Se- VS7700000
Tl- XG3425000
V- YW0875000
Zn- ZG8600000
$Sr(NO_3)_2$- WK9800000

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: (Antimony) 7g/kg
LD_{50}, Oral, Rat: (Arsenic) 763 mg/kg
TD_{LO} Intratracheal, Rat: (Beryllium Acetate) 13 mg/kg

LD_{LO} Oral, Human: (Cadmium) 2330 mg/kg
LD_{50} Unreported Route, Rat: (Chromium) 27.5 mg/kg
LD_{LO} Oral, Rabbit: (Cobalt) 750 mg/kg
TD_{LO} Oral, Human: (Copper) 120 μg/kg
TD_{50} Oral, Woman: (Lead) 450 mg/kg/6 year
LD_{50} Oral, Rat: (Lithium Carbonate) 525 mg/kg
LD_{50} Oral, Rat: (Manganese) 9 g/kg
TD_{LO} Oral, Mouse: (Molybdenum) 448 mg/kg (multigenerations)
Mouse: (Nickel) 50 mg/kg
LD_{50}, Oral, Rat: (Selenium) 6700 mg/kg
TD_{LO} Oral, Man: (Thallium) 5,714 μg/kg
LD_{50} Oral, Rat: (Ammonium Metavanadate) 58,100 μg/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 (Hydrofluoric Acid-U134); (NH_4VO_3-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, R48 Harmful by inhalation or skin contact or if swallowed; 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

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.