Section 1. Product and Company Identification

Product Identification: CRM-SW
MSDS Number: CRM-SW
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
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	
Ammonium Bromide (NH_4Br)	12124-97-9	0.007 (as Br)
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	0.04 (as Ca)
Cadmium	7440-43-9/231-152-8	<0.001
Chromium	7440-47-3/231-157-5	<0.001
Copper	7440-50-8/231-159-6	<0.001
Gold	7440-57-5/231-165-9	<0.001
Ammonium Iodide (NH_4I)	12027-06-4/234-717-7	<0.001 (as I)
Iron	7439-89-6/231-096-4	<0.001

Lead	7439-92-1/231-100-4	<0.001
Lithium Carbonate (Li_2CO_3)	554-13-2/209-062-5	<0.001 (as Li)
Magnesium	7439-95-4/231-104-6	0.12
Manganese Acetate Tetrahydrate $(Mn(CH_3CO_2)_2)*4H_2O$	6156-78-1/211-334-3	<0.001 (as Mn)
Mercury	7439-97-6/231-106-7	<0.001
Ammonium Molybdate $((NH_4)_2MoO_4 \cdot 4H_2O)$	13106-76-8/236-031-3	<0.001 (as Mo)
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)
Oxalic Acid ($C_2H_2O_4$ $2H_2O$)	6153-56-6	0.003 (as C)
Potassium Nitrate (KNO_3)	7757-79-1/231-818-8	0.038 (as K)
Rubidium Nitrate ($RbNO_3$)	13126-12-0/236-060-1	<0.001 (as Rb)
Scandium Oxide (Sc_2O_3)	12060-08-1/235-042-0	<0.001 (as Sc)
Selenium	7782-49-2/231-957-4	<0.001
Ammonium Hexafluorosilicate $((NH_4)_2SiF_6)$	16919-19-0/240-968-3	<0.001 (as Si)
Silver	7440-22-4/231-131-3	<0.001
Sodium Chloride (NaCl)	7647-14-5/231-598-3	1.05 (as Na) 1.62 (as Cl)
Ammonium Chloride (NH_4Cl)	12125-02-9/235-186-4	0.28 (as Cl)
Strontium Carbonate ($SrCO_3$)	1633-05-2/216-643-7	0.001 (as Sr)
Sulfuric Acid (H_2SO_4)	7664-93-9/321-639-5	0.09 (as S)
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)
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. 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.

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
Ammonium Bromide	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
Chromium	0.5 mg/m^3	1 mg/m^3
Copper	0.2 mg/m^3 (fumes)	0.1 mg/m^3 (fumes)

Gold	Not Available	Not Available
Ammonium Iodide	Not Available	Not Available
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 Acetate Tetrahydrate	0.2 mg/m^3	C 5 mg/m^3
Mercury	0.05 mg/m^3	0.025 mg/m^3
Ammonium Molybdate	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
Oxalic Acid	1 mg/m^3 (as anhydrous acid)	Not Available
Potassium Nitrate	Not Available	Not Available
Rubidium Nitrate	Not Available	Not Available
Scandium Oxide	Not Available	Not Available
Selenium	0.2 mg/m^3	0.2 mg/ m^3
Ammonium Hexafluorosilicate	Not Available	Not Available
Silver	0.1 mg/m^3	Not Available
Sodium Chloride	Not Available	Not Available
Ammonium Chloride	10 mg/m^3	Not Available
Strontium Carbonate	Not Available	Not Available
Sulfuric Acid	5 mg/m^3	1 mg/m^3
Uranium Oxide	0.2 mg/m^3	0.05 mg/m^3
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
Water, deionized	Not Available	Not Available

Section 9. Physical and Chemical Properties

Physical State: Liquid
Color: Clear, colorless to light greyish liquid
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 uranium oxide at <0.001% concentration. Pure uranium oxide is 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
Cr - GB4200000
KNO_3 - TT3700000
Mo- QA4680000
H_2SO_4- WS5600000
Zn - ZG8600000
$SrCO_3$-WK8305000
Fe-NO4565500
$Ba(NO_3)_2$- CQ9625000
Ag - VW3500000
Au- MD5070000
$CaCO_3$ - EV9580000
Cu - GL5325000
Li_2CO_3 - OJ5800000
Ni - QR5950000
Se - VS7700000
$RbNO_3$-QV0900000
NH_4VO_3- YW0875000
Cu-GL5325000
Al - BD0330000
H_3BO_3 - ED450000
Cd - EU9800000
Hg- OV4550000
Mn-AI5775000
Pb - OF7525000
U_3O_8 - YR3490000
$(NH_4)_2SiF_6$-VV7800000
Mg-OM2100000
$C_2H_2O_4$ $2H_2O$- RO2450000

LD_{LO} Oral, Human: (Nitric Acid) 430 mg/kg
TD_{LO} Implant, Mouse: (Silver) 11 g/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.
LD_{LO} Oral, Human: (Cadmium) 2330 mg/kg
LD_{50} Unreported Route, Rat: (Chromium) 27.5 mg/kg
TD_{LO} Oral, Human: (Copper) 120 µg/kg
TC_{LO} Inhalation, Rat: (Mercury) 1 mg/m^3/24hrs/5wks continuous
LD_{50} Oral, Rat: (Potassium Nitrate) 3750 mg/kg
LD_{50} Oral, Rat: (Lithium Carbonate) 525 mg/kg
LD_{50} Oral, Rat: (Manganse) 3730mg/kg
TD_{LO} Oral, Mouse: (Molybdenum) 448 mg/kg (multigenerations)
LD_{50} Oral, Mouse: (Sodium Chloride) 4 g/kg
LD_{50}, Oral, Rat: (Ammonium Bromide) 2700 mg/kg
LD_{50}, Intravenous, Mouse: (Nickel) 50 mg/kg
LD_{50} Oral, Rat: (Oxalic Acid) 375 mg/kg

TD_{50} Oral, Woman: (Lead) 450 mg/kg/6 years
LD_{50}, Oral, Rat: (Selenium) 6700 mg/kg
LD_{50} Oral, Rat: (Sulfuric Acid) 2140 mg/kg
LC_{50} Inhalation, Rat: (Sulfuric Acid) 510 mg/m^3/2H. No toxic effect noted
TD_{50} Unreported Route, Rat: (Uranium Oxide) 750 mg/kg
LD_{LO} Oral, Duck: (Zinc) 388 mg/kg
LD_{50} Oral, Rat: (Ammonium Chloride) 1650 mg/kg
LD_{50} Oral, Rat: (Rubidium Nitrate) 4625 mg/kg
LD_{LO} Oral, Rat: (Ammonium Hexafluorosilicate) 100 mg/kg
LD_{50} Oral, Rat: (Ammonium Metalvanadate) 58 mg/kg
LD_{50} Oral, Rat: (Iron) 30 g/kg

Section 12. Ecological Information

Ecotoxicological information: Do not allow material to reach ground water, water bodies, or sewage system.

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: Ammonium metavanadate (7803-55-6)
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 swallowed.
Safety Phrases: S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
WHMIS Information (Canada): E: Corrosive

CRM-SW is a limited quantity radioactive material that is exempt from radioactive labeling requirements under 49CFR section 173.421. The massic activity of CRM-SW is less than 0.3k Bq.

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.