

## Material Safety Data Sheet

### Section 1. Product and Company Identification

Product Identification: CRM-SW  
 MSDS Number: CRM-SW  
 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. Chemical Composition

Component	CAS/EINECS Registry #	Percent Concentration	ACGIH TLV	OSHA PEL
Aluminum	7429-90-5/231-072-3	<0.001	10 mg/m <sup>3</sup>	15 mg/m <sup>3</sup>
Arsenic	7440-38-2/231-148-6	<0.001	0.01 mg/m <sup>3</sup>	10 µg/ m <sup>3</sup>
Barium Carbonate (BaCO <sub>3</sub> )	513-77-9/208-167-3	<0.001 (as Ba)	0.5 mg/m <sup>3</sup>	0.5 mg/m <sup>3</sup>
Ammonium Bromide (NH <sub>4</sub> Br)	12124-97-9	0.007 (as Br)		
Boric Acid (H <sub>3</sub> BO <sub>3</sub> )	10043-35-3/233-139-2	<0.001 (as B)	Not Available	Not Available
Calcium Carbonate (CaCO <sub>3</sub> )	471-34-1/207-439-9	0.04 (as Ca)	0.5 mg/m <sup>3</sup>	0.5 mg/m <sup>3</sup>
Cadmium	7440-43-9/231-152-8	<0.001	0.002 mg/m <sup>3</sup> (respirable particulate)	0.005 mg/m <sup>3</sup>
Chromium	7440-47-3/231-157-5	<0.001	0.5 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>
Copper	7440-50-8/231-159-6	<0.001	0.2 mg/m <sup>3</sup> (fumes)	0.1 mg/m <sup>3</sup> (fumes)
Gold	7440-57-5/231-165-9	<0.001	Not Available	Not Available
Iron	7439-89-6/231-096-4	<0.001	10 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>
Lead	7439-92-1/231-100-4	<0.001	0.05 mg/m <sup>3</sup>	0.05 mg/m <sup>3</sup>
Lithium Carbonate (Li <sub>2</sub> CO <sub>3</sub> )	554-13-2/209-062-5	<0.001 (as Li)	Not Available	Not Available
Magnesium	7439-95-4/231-104-6	0.12	Not Available	Not Available
Manganese	7439-96-5/231-105-1	<0.001	0.2 mg/m <sup>3</sup>	C 5 mg/m <sup>3</sup>
Mercury	7439-97-6/231-106-7	<0.001	0.05 mg/m <sup>3</sup>	0.025 mg/m <sup>3</sup>
Molybdenum	7439-98-7/231-107-2	<0.001	5 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>

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Nickel	7440-02-0/231-111-4	<0.001	1.5 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>
Ammonium Dihydrogen Phosphate (NH <sub>4</sub> H <sub>2</sub> PO <sub>4</sub> )	7722-76-1/231-764-5	<0.001 (as P)	Not Available	Not Available
Oxalic Acid (C <sub>2</sub> H <sub>2</sub> O <sub>4</sub> 2H <sub>2</sub> O)	6153-56-6	0.003 (as C)	1 mg/m <sup>3</sup> (as anhydrous acid)	Not Available
Potassium Nitrate (KNO <sub>3</sub> )	7757-79-1/231-818-8	0.038 (as K)	Not Available	Not Available
Rubidium Carbonate (Rb <sub>2</sub> CO <sub>3</sub> )	584-09-8/209-530-9	<0.001 (as Rb)	Not Available	Not Available
Scandium Oxide (Sc <sub>2</sub> O <sub>3</sub> )	12060-08-1/235-042-0	<0.001 (as Sc)	Not Available	Not Available
Selenium	7782-49-2/231-957-4	<0.001	0.2 mg/m <sup>3</sup>	0.2 mg/m <sup>3</sup>
Ammonium Hexafluorosilicate (NH <sub>4</sub> SiF <sub>6</sub> )	16919-19-0/240-968-3	<0.001 (as Si)	Not Available	Not Available
Silver	7440-22-4/231-131-3	<0.001	0.1 mg/m <sup>3</sup>	Not Available
Sodium Chloride	7647-14-5/231-598-3	2.5	Not Available	Not Available
Strontium Carbonate (Sr <sub>2</sub> CO <sub>3</sub> )	1633-05-2/216-643-7	0.001 (as Sr)	Not Available	Not Available
Sulfuric Acid	7664-93-9/321-639-5	0.09 (as S)	5 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>
Uranium Oxide (U <sub>3</sub> O <sub>8</sub> )	1344-59-8/215-702-4	<0.001 (as U)	0.2 mg/m <sup>3</sup>	0.05 mg/m <sup>3</sup>
Ammonium Metavanadate (NH <sub>4</sub> VO <sub>3</sub> )	7803-55-6/232-261-3	<0.001 (as V)	0.05 mg/m <sup>3</sup>	Not Available
Zinc	7440-66-6/231-175-3	<0.001	5 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>
Nitric Acid (HNO <sub>3</sub> )	7697-37-2/231-714-2	2	2 mg/kg	5 mg/m <sup>3</sup>
Water, deionized	7732-18-5/231-791-2	Balance	Not Available	Not Available

### Section 3. Hazard Identification

**Emergency Overview:** Mildly corrosive. May cause irritation to areas of contact. Wash areas of contact with water for at least 15 minutes. If ingested, do not induce vomiting. Dilute with water and call a physician. While present in very small quantities, arsenic, cadmium, lead and nickel may cause cancer.

**Target Organs:** Eyes, skin, respiratory system, immune system, nasal cavities, teeth, blood, bones. Arsenic increases risk of lung, liver, kidney, and bladder cancer with prolonged exposure.

**Skin/eye Contact:** Liquid may cause burns to skin and eyes.

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Inhalation: May cause irritation. Inhalation of high concentrations of nickel may cause irritation of mucous membranes causing sore throat, coughing, and shortness of breath.

Ingestion: May cause nausea, vomiting, and diarrhea. Ingestion of arsenic compounds may be poisonous, leading to death. Cadmium is a poison that accumulates in the liver and kidneys. Animal studies indicate that prolonged ingestion of some soluble nickel compounds may affect the blood, bone marrow, thymus, spleen, kidneys, and immune system.

#### Section 4. First Aid Measures

Inhalation: Remove to fresh air. Give artificial respiration if necessary. If breathing is difficult, give oxygen.

Skin/eye Contact: Flush eyes with plenty of water for at least 15 minutes. Remove contaminated shoes and clothing. Rinse affected area with large amount of water followed by washing the area with soap and water. Call a physician if irritation develops.

Ingestion: CALL A PHYSICIAN; If swallowed rinse mouth, do NOT induce vomiting, if conscious give large quantities of water or milk.

#### 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. NO<sub>x</sub> compounds can be released in event 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. Cover the spill with sodium bicarbonate or a soda ash-slaked lime mixture (50:50) to neutralize the acid. 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. Wash exposed skin area thoroughly after handling.

#### Section 8. Exposure Controls and Personal Protection

Engineering Controls: No specific controls are needed. Normal room ventilation is adequate.

Respiratory Protection: Normal room ventilation is adequate.

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

#### Section 9. Physical and Chemical Properties

Molecular Weight: N/A

Boiling Point: ~100°C

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Freezing Point: N/A  
Vapor Pressure (mm): N/A  
Vapor Density (air+1): N/A  
Specific Gravity (H<sub>2</sub>O = 1): Approximately 1.0  
Solubility in H<sub>2</sub>O: Complete  
Appearance: Clear, colorless to light greyish liquid  
Odor: Odorless to a faint pungent odor  
pH: <1

**Section 10. Stability and Reactivity**

Stability Indicator: YES  
Conditions to Avoid: Metals, chlorine, organic materials, strong alkali, cyanides.  
Incompatibles: Strong reducing agents.  
Hazardous Decomposition Products: 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: NO

**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 <sub>3</sub> - QU5775000	Ag - VW3500000	Al - BD0330000	As - CG0525000
Au - MD5070000	H <sub>3</sub> BO <sub>3</sub> - ED450000	BaCO <sub>3</sub> - CQ8600000	CaCO <sub>3</sub> - EV9580000
Cd - EU9800000	Cr - GB4200000	Cu - GL5325000	Hg - OV4550000
KNO <sub>3</sub> - TT3700000	Li <sub>2</sub> CO <sub>3</sub> - OJ5800000	Mn - OO9275000	Mo - QA4680000
Ni - QR5950000	C <sub>2</sub> H <sub>2</sub> O <sub>4</sub> 2H <sub>2</sub> O - RO2450000		Pb - OF7525000
H <sub>2</sub> SO <sub>4</sub> - WS5600000	Se - VS7700000	U - YR3490000	Zn - ZG8600000

Toxicity Data:  
LD<sub>LO</sub> Oral, Human: (HNO<sub>3</sub>) 430 mg/kg; TD<sub>LO</sub> Implant, Mouse: (Ag) 11 g/kg; LD<sub>50</sub> Oral, Rat: (Al) >5000 mg/kg; LD<sub>50</sub>, Oral, Rat: (As) 763 mg/kg; LD<sub>50</sub> Oral, Rat: (H<sub>3</sub>BO<sub>3</sub>) 2660 mg/kg; LD<sub>LO</sub> Oral, Human: (BaCO<sub>3</sub>) 17 mg/kg; LD<sub>LO</sub> Oral, Human: (Cd) 2330 mg/kg; LD<sub>50</sub> Unreported Route, Rat: (Cr) 27.5 mg/kg; TD<sub>LO</sub> Oral, Human: (Cu) 120 µg/kg; TC<sub>LO</sub> Inhalation, Rat: (Hg) 1 mg/m<sup>3</sup>/24hrs/5wks continuous; LD<sub>50</sub> Oral, Rat: (KNO<sub>3</sub>) 3750 mg/kg; LD<sub>50</sub> Oral, Rat: (Li<sub>2</sub>CO<sub>3</sub>) 525 mg/kg; LD<sub>50</sub> Oral, Rat: (Mn) 9 g/kg; TD<sub>LO</sub> Oral, Mouse: (Mo) 448 mg/kg (multigenerations); LD<sub>50</sub> Oral, Mouse: (NaCl) 4 g/kg; LD<sub>50</sub>, Oral, Rat: (NH<sub>4</sub>Br) 2700 mg/kg; LD<sub>50</sub>, Intravenous, Mouse: (Ni) 50 mg/kg; LD<sub>50</sub> Oral, Rat: (C<sub>2</sub>H<sub>2</sub>O<sub>4</sub> 2H<sub>2</sub>O) 375 mg/kg; TD<sub>50</sub> Oral, Woman: (Pb) 450 mg/kg/6 years; LD<sub>50</sub>, Oral, Rat: (Se) 6700 mg/kg; LD<sub>50</sub> Oral, Rat: (Sulfuric Acid) 2140 mg/kg; LC<sub>50</sub> Inhalation, Rat: (Sulfuric Acid) 510 mg/m<sup>3</sup>/2H. No toxic effect noted; TD<sub>50</sub> Unreported Route, Rat: (U<sub>3</sub>O<sub>8</sub>) 750 mg/kg; LD<sub>LO</sub> 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.

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#### Section 13. Disposal Considerations

Follow federal, state and local regulations for acid waste.

#### Section 14. Transport Information

D.O.T. Classification: Not Hazardous by DOT regulations (based on concentration **of acid**).

#### 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: No

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

Note: CRM-TMF is an inorganic solution containing no biological materials.

#### 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 rest solely with the buyer and/or user. The MSDS was prepared carefully and represents the best data currently available to us; however, HPS does not certify the data on the MSDS. Certified values for this material are given only on the Certificate of Analysis.

Theodore C. Rains, Ph.D.