

Material Safety Data Sheet

Section 1. Product and Company Identification

Product Identification: CRM-ES
 MSDS Number: CRM-ES
 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	0.07	10 mg/m ³	15 mg/m ³
Antimony	7440-36-0/ 231-146-5	<0.001	0.5 mg/m ³	0.5 mg/m ³
Arsenic	7440-38-2/ 231-148-6	<0.001	0.01 mg/m ³	10 µg/ m ³
Beryllium Acetate (Be ₄ O(C ₂ H ₃ O ₂) ₆)	19049-40-2/ 242-785-4	<0.001 (as Be)	0.002 mg/m ³	0.002 mg/m ³
Cadmium	7440-43-9/ 231-152-8	<0.001	0.002 mg/m ³ (respirable particulate)	0.005 mg/m ³
Calcium Carbonate (CaCO ₃)	471-34-1/ 207-439-9	0.008 (as Ca)	0.5 mg/m ³	0.5 mg/m ³
Chromium	7440-47-3/ 231-157-5	<0.001	0.5 mg/m ³	1 mg/m ³
Cobalt	7440-48-4/ 231-158-0	<0.001	0.02 mg/m ³	0.1 mg/m ³
Copper	7440-50-8/ 231-159-6	<0.001	0.2 mg/m ³ (fumes)	0.1 mg/m ³ (fumes)
Iron	7439-89-6/ 231-096-4	0.035	10 mg/m ³	5 mg/m ³
Lead	7439-92-1/ 231-100-4	<0.001	0.05 mg/m ³	0.05 mg/m ³
Magnesium	7439-95-4/ 231-104-6	0.01	Not Available	Not Available
Manganese	7439-96-5/ 231-105-1	<0.001	0.2 mg/m ³	C 5 mg/m ³
Nickel	7440-02-0/ 231-111-4	<0.001	1.5 mg/m ³	1 mg/m ³
Ammonium Dihydrogen Phosphate (NH ₄ H ₂ PO ₄)	7722-76-1/ 231-764-5	<0.001 (as P)	Not Available	Not Available
Potassium Nitrate (KNO ₃)	7757-79-1/ 231-818-8	0.015 (as K)	Not Available	Not Available

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Selenium	7782-49-2/ 231-957-4	<0.001	0.2 mg/m ³	0.2 mg/ m ³
Ammonium Hexafluorosilicate ((NH ₄) ₂ SiF ₆)	16919-19-0/ 240-968-3	0.3 (as Si)	Not Available	Not Available
Sodium Carbonate (Na ₂ CO ₃)	497-19-8/ 207-838-8	0.02 (as Na)	Not Available	Not Available
Thorium Oxide (ThO ₂)	1314-20-1/ 215-225-1	<0.001 (as Th)	Not Available	Not Available
Ammonium Metavanadate (NH ₄ VO ₃)	7803-55-6/ 232-261-3	<0.001 (as V)	0.05 mg/m ³	0.05 mg/m ³
Zinc	7440-66-6/ 231-175-3	<0.001	5 mg/m ³	1 mg/m ³
Nitric Acid	7697-37-2/ 231-714-2	4	2 mg/kg	5 mg/m ³
Water, deionized	7732-18-5/ 231-791-2	Balance	Not Available	Not Available

Section 3. Hazard Identification

Emergency Overview: Corrosive. 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. All potential carcinogens are present at minute amounts.

Target Organs: Eyes, skin, respiratory system, immune system, nasal cavities, teeth, blood, bones.

Skin/eye Contact: Cause burns to skin and eyes.

Inhalation: May cause irritation.

Ingestion: May cause nausea, vomiting, and diarrhea.

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_x 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.

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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: Approximately 100°C
 Freezing Point: N/A
 Vapor Pressure (mm): N/A
 Vapor Density (air+1): N/A
 Specific Gravity (H₂O = 1): Approximately 1.0
 Solubility in H₂O: Complete
 Appearance: Clear, colorless to grey, 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_x compounds including nitric oxide (NO), nitrogen dioxide (NO₂), nitrous oxide (N₂O) and nitric acid mist or vapor.
 Hazardous Polymerization: Does not polymerize.

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. All potential carcinogens are present at minute amounts.

RTECS #:

HNO₃ - QU5775000 Al - BD0330000 As - CG0525000
 Be₄O(C₂H₃O₂)₆ DS2900000 CaCO₃ - FF9335000 Cd - EU9800000

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Co - GF8750000	Cr - GB4200000	Cu - GL5325000	Fe - NO4565500
KNO ₃ - TT3700000	Mg - FW6475100	Mn - OO9275000	Na ₂ CO ₃ - VZ4050000
Ni - QR5950000	Pb - OF7525000	Sb - CC4025000	Se - VS7700000
(NH ₄) ₂ SiF ₆ - VV7800000		ThO ₂ - XO6950000	NH ₄ VO ₃ - YW0875000
Zn - ZG8600000			

Toxicity Data:

LD_{LO} Oral, Human: (HNO₃) 430 mg/kg; LD₅₀ Oral, Rat: (Al) >5000 mg/kg; LD₅₀, Oral, Rat: (As) 763 mg/kg; TD_{LO} Intratracheal, Rat: (Be₄O(C₂H₃O₂)₆) 13 mg/kg; LD_{LO} Oral, Rabbit: (Co) 750 mg/kg; LD₅₀ Unreported Route, Rat: (Cr) 27.5 mg/kg; TD_{LO} Oral, Human: (Cu) 120 µg/kg; LD₅₀ Oral, Rat: (KNO₃) 3750 mg/kg; LD₅₀ Oral, Rat: (Mn) 9 g/kg; LD₅₀, Oral, Mouse: (Na₂CO₃) 6600 mg/kg; LD₅₀, Intravenous, Mouse: (Ni) 50 mg/kg; TD₅₀ Oral, Woman: (Pb) 450 mg/kg/6 years; LD₅₀ Oral, Rat: (Sb) 7g/kg; LD₅₀, Oral, Rat: (Se) 6700 mg/kg; LD_{LO} Oral, Rat: ((NH₄)₂SiF₆) 100 mg/kg; TD_{LO} Intraarterial, Human: (ThO₂) 490 mg/kg; LD₅₀ Oral, Rat: (NH₄VO₃) 58 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.

Section 13. Disposal Considerations

Follow federal, state and local regulations for waste.

Section 14. Transport Information

D.O.T. Classification: Hazardous by IATA 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: III
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: 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

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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.