

Material Safety Data Sheet

Section 1. Product and Company Identification

Product Identification: WAVECAL-2
 MSDS Number: WAVECAL-2
 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	0.005	10 mg/m ³	15 mg/m ³
Arsenic	7440-38-2/ 231-148-6	0.005	0.01 mg/m ³	10 µg/ m ³
Barium Carbonate (BaCO ₃)	513-77-9/ 208-167-3	0.005 (as Ba)	0.5 mg/m ³	0.5 mg/m ³
Cadmium	7440-43-9/ 231-152-8	0.005	0.002 mg/m ³ (respirable particulate)	0.005 mg/m ³
Chromium	7440-47-3/ 231-157-5	0.005	0.5 mg/m ³	1 mg/m ³
Cobalt	7440-48-4/ 231-158-0	0.005	0.02 mg/m ³	0.1 mg/m ³
Copper	7440-50-8/ 231-159-6	0.005	0.2 mg/m ³ (fumes)	0.1 mg/m ³ (fumes)
Lead	7439-92-1/ 231-100-4	0.005	0.05 mg/m ³	0.05 mg/m ³
Manganese	7439-96-5/ 231-105-1	0.005	0.2 mg/m ³	C 5 mg/m ³
Ammonium Molybdate ((NH ₄) ₂ MoO ₄ ·4H ₂ O)	13106-76-8/ 236-031-3	0.005 (as Mo)	5 mg/m ³	5 mg/m ³
Nickel	7440-02-0/ 231-111-4	0.005	1.5 mg/m ³	1 mg/m ³
Potassium Nitrate (KNO ₃)	7757-79-1/ 231-818-8	0.05 (as K)	Not Available	Not Available
Selenium	7782-49-2/ 231-957-4	0.005	0.2 mg/m ³	0.2 mg/ m ³
Strontium Nitrate (Sr(NO ₃) ₂)	10042-76-9/ 233-131-9	0.005 (as Sr)	Not Available	Not Available
Zinc	7440-66-6/ 231-175-3	0.005	5 mg/m ³	1 mg/m ³
Nitric Acid (HNO ₃)	7697-37-2/ 231-714-2	5	2 mg/kg	5 mg/m ³
Water, deionized	7732-18-5/231-791-2	Balance	Not Available	Not Available

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Section 3. Hazard Identification

Emergency Overview: 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. Arsenic, cadmium, cobalt, lead, and nickel are suspected carcinogens.

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

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_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.

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.

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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

Freezing Point: N/A

Vapor Pressure (mm): N/A

Vapor Density (air+1): N/A

Specific Gravity (H₂O = 1): N/A

Solubility in H₂O: Complete

Appearance: Clear, blueish-grey tint

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.

Arsenic, Cadmium, Cobalt, Lead, and Nickel are investigated as possible tumorigens.

RTECS #:

HNO₃ - QU5775000

Al - BD0330000

As - CG0525000

BaCO₃ - CQ8600000

Cd - EU9800000

Co - GF8750000

Cr - GB4200000

Cu - GL5325000

Pb - OF7525000

KNO₃ - TT3700000

Mn - OO9275000

Ni - QR5950000

(NH₄)₂MoO₄ - QA4680000

Se - VS7700000

Zn - ZG8600000

Sr(NO₃)₂ - WK9800000

Toxicity Data:

LD_{LO} Oral, Human: (HNO₃) 430 mg/kg; LD₅₀ Oral, Rat: (Al) >5000 mg/kg; LD₅₀, Oral, Rat: (As)

763 mg/kg; LD_{LO} Oral, Human: (Cd) 2330 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 mg/kg; LD₅₀ Oral, Rat:

(KNO₃) 3750 mg/kg; LD₅₀ Oral, Rat: (Mn) 9 g/kg; TD_{LO} Oral, Rat: (Mo) 333 mg/kg

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(multigenerations); LD₅₀, Intravenous, Mouse: (Ni) 50 mg/kg; LD₅₀, Oral, Rat: (Se) 6700 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)
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)

OSHA Status: These items meet the OSHA Hazard Communication Standard (29 CFR 1910.1200) definition of a hazardous material.
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, R21, R22, R24, R25, , R45, R48 Harmful by inhalation or skin contact; Toxic in contact with the skin and if swallowed; May cause cancer; Danger of serious damage to health by prolonged exposure; Danger of cumulative effects.
Safety Phrases: S36/37/39, S53 Wear suitable protective clothing, gloves and eye/face protection; Avoid exposure- obtain special instruction before use.
WHMIS Information (Canada): D2B: Poisonous/Carcinogen
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 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.