

SAFETY DATA SHEET

Preparation Date: 1/29/2015

Revision Date: 1/29/2015

Revision Number: G1

Product identifier

Product code: PM470
Product Name: ICP QUALITY CONTROL STANDARD, SOLUTION I

Other means of identification

Synonyms: No information available
CAS #: Mixture
RTECS # Not available
CI#: Not available

Recommended use of the chemical and restrictions on use

Recommended use: No information available.
Uses advised against No information available

Supplier: Spectrum Chemicals and Laboratory Products, Inc.
14422 South San Pedro St.
Gardena, CA 90248
(310) 516-8000

Order Online At: <https://www.spectrumchemical.com>

Emergency telephone number Chemtrec 1-800-424-9300
Contact Person: Martin LaBenz (West Coast)
Contact Person: Ibad Tirmiz (East Coast)

2. HAZARDS IDENTIFICATION

Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

| | |
|-----------------------------------|---------------------------|
| Skin corrosion/irritation | Category 1 Sub-category B |
| Serious eye damage/eye irritation | Category 1 |

Label elements

Danger**Hazard statements**

Causes severe skin burns and eye damage

**Hazards not otherwise classified (HNOC)**

Not Applicable

Other hazards

Not available

Precautionary Statements - Prevention

Do not breathe dust/fume/gas/mist/vapors/spray

Wash face, hands and any exposed skin thoroughly after handling

Wear protective gloves/protective clothing/eye protection/face protection

Precautionary Statements - Response

Immediately call a POISON CENTER or doctor/physician

Specific treatment (see .? on this label)

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 or doctor/physician.

IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower

Wash contaminated clothing before reuse

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician.

IF SWALLOWED: Rinse mouth. DO NOT induce vomiting

Precautionary Statements - Storage

Store locked up

Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

3. COMPOSITION/INFORMATION ON INGREDIENTS

| Components | CAS-No. | Weight % | Trade Secret |
|---|------------|-----------|--------------|
| Water 7732-18-5 | 7732-18-5 | 94.5-95.5 | * |
| Nitric acid 7697-37-2 | 7697-37-2 | 4.5-5.5 | * |
| Selenium 7782-49-2 | 7782-49-2 | 0.01 | * |
| Chromium Nitrate nonahydrate 7789-02-8 | 7789-02-8 | 0.01 | * |
| Antimony Trioxide 1309-64-4 | 1309-64-4 | 0.01 | * |
| Ammonium Molybdate 13106-76-8 | 13106-76-8 | 0.01 | * |
| Ammonium Hexafluorotitanate 16962-40-6 | 16962-40-6 | 0.01 | * |
| Calcium Carbonate 471-34-1 | 471-34-1 | 0.01 | * |

3. COMPOSITION/INFORMATION ON INGREDIENTS

| | | | |
|--------------------------------------|-----------|------|---|
| Iron Metal 7439-89-6 | 7439-89-6 | 0.01 | * |
| Lead 7439-92-1 | 7439-92-1 | 0.01 | * |
| Magnesium 7439-95-4 | 7439-95-4 | 0.01 | * |
| Manganese Metal, powder 7439-96-5 | 7439-96-5 | 0.01 | * |
| Nickel 7440-02-0 | 7440-02-0 | 0.01 | * |
| Thallium 7440-28-0 | 7440-28-0 | 0.01 | * |
| Arsenic 7440-38-2 | 7440-38-2 | 0.01 | * |
| Beryllium 7440-41-7 | 7440-41-7 | 0.01 | * |
| Cadmium 7440-43-9 | 7440-43-9 | 0.01 | * |
| Cobalt 7440-48-4 | 7440-48-4 | 0.01 | * |
| Copper Metal 7440-50-8 | 7440-50-8 | 0.01 | * |
| Vanadium 7440-62-2 | 7440-62-2 | 0.01 | * |
| Zinc 7440-66-6 | 7440-66-6 | 0.01 | * |

4. FIRST AID MEASURES

First aid measures

General Advice:

Poison information centres in each State capital city can provide additional assistance for scheduled poisons (13 1126). Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. First aider needs to protect himself.

Skin Contact:

Wash off immediately with soap and plenty of water. Continue flushing with plenty of water for at least 15 minutes. Remove all contaminated clothes and shoes. Immediate medical attention is required. Call a physician immediately.

Eye Contact:

Flush eye with water for 15 minutes. Immediate medical attention is required. Call a physician immediately.

Inhalation:

Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. **WARNING!** It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled or ingested material is toxic, infectious or corrosive. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Immediate medical attention is required. Call a physician immediately.

Ingestion:

Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. If victim is conscious, give water or milk. Follow with Milk of Magnesia or egg whites beaten with water. Immediate medical attention is required. Call a physician or Poison Control Centre immediately.

Most important symptoms and effects, both acute and delayed

Symptoms

Severe skin and eye irritation or burns. Dyspnea (Shortness of breath and difficulty breathing). Abdominal pain. Vomiting.

Indication of any immediate medical attention and special treatment needed

Notes to Physician: Treat symptomatically

Protection of first-aiders

First-Aid Providers: Avoid exposure to blood or body fluids. Wear gloves and other necessary protective clothing. Dispose of contaminated clothing and equipment as bio-hazardous waste

5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media: The product is not flammable. If it is involved in a fire, extinguish the fire using an agent suitable for the type of surrounding fire.

Unsuitable Extinguishing Media: No information available.

Specific hazards arising from the chemical

Hazardous Combustion Products: No information available.

Specific hazards: No information available..

Special Protective Actions for Firefighters

Specific Methods: No information available.

Special Protective Equipment for Firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions: Keep people away from and upwind of spill/leak. Ensure adequate ventilation. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Use personal protective equipment. Avoid contact with skin, eyes and clothing.

Environmental precautions Prevent further leakage or spillage if safe to do so. Should not be released into the environment. Do not let product enter drains. Do not flush into surface water or sanitary sewer system. Prevent entry into waterways, sewers, basements or confined areas.

Methods and material for containment and cleaning up

Methods for containment Stop leak if you can do it without risk.

Methods for cleaning up Neutralize with Sodium carbonate or Sodium bicarbonate. Dilute with water. Absorb spill with inert material (e.g. vermiculite, dry sand or earth), then place in a suitable chemical waste container. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Precautions for safe handling

Technical Measures/Precautions:

Use only in area provided with appropriate exhaust ventilation. Keep away from incompatible materials.

Safe Handling Advice:

Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Do not ingest. Do not breathe vapors or spray mist. Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities**Technical Measures/Storage Conditions:**

Keep container tightly closed in a dry and well-ventilated place. Store at room temperature in the original container. Store in a segregated and approved area. Store away from incompatible materials.

Incompatible Materials:

Bases. Reducing agents. Metals. Powdered metals.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Control parameters****National occupational exposure limits****United States**

| Components | OSHA | NIOSH | ACGIH | AIHA WHEEL |
|--|---|---|--|--------------------------|
| Water - 7732-18-5 | None | None | None | None |
| Nitric acid - 7697-37-2 | 2 ppm TWA 5 mg/m ³ TWA | 2 ppm TWA 5 mg/m ³ TWA 4 ppm STEL 10 mg/m ³ STEL | 4 ppm STEL 2 ppm TWA | No information available |
| Selenium - 7782-49-2 | None | 0.2 mg/m ³ TWA | 0.2 mg/m ³ TWA | None |
| Chromium Nitrate nonahydrate - 7789-02-8 | None | None | None | None |
| Antimony Trioxide - 1309-64-4 | None | None | None | None |
| Ammonium Molybdate - 13106-76-8 | None | None | None | None |
| Ammonium Hexafluorotitanate - 16962-40-6 | None | None | None | None |
| Calcium Carbonate - 471-34-1 | None | 10 mg/m ³ TWA 5 mg/m ³ TWA | None | None |
| Iron Metal - 7439-89-6 | None | None | None | None |
| Lead - 7439-92-1 | 50 µg/m ³ TWA | 0.050 mg/m ³ TWA | 0.05 mg/m ³ TWA | None |
| Magnesium - 7439-95-4 | None | None | None | None |
| Manganese Metal, powder - 7439-96-5 | 5 mg/m ³ Ceiling | 1 mg/m ³ TWA 3 mg/m ³ STEL | 0.02 mg/m ³ TWA respirable fraction 0.1 mg/m ³ TWA inhalable fraction | None |
| Nickel - 7440-02-0 | 1 mg/m ³ TWA | 0.015 mg/m ³ TWA | 1.5 mg/m ³ TWA inhalable fraction = 0.1 mg/m ³ TWA | None |
| Thallium - 7440-28-0 | None | None | None | None |
| Arsenic - 7440-38-2 | None | 0.002 mg/m ³ Ceiling 15 min | 0.01 mg/m ³ TWA | None |
| Beryllium - 7440-41-7 | 2 µg/m ³ TWA 5 µg/m ³ Ceiling | 0.0005 mg/m ³ Ceiling | 0.00005 mg/m ³ TWA inhalable fraction | None |
| Cadmium - 7440-43-9 | 0.1 mg/m ³ TWA 0.2 mg/m ³ TWA 5 µg/m ³ TWA 0.3 mg/m ³ Ceiling 0.6 mg/m ³ Ceiling | None | 0.01 mg/m ³ TWA 0.002 mg/m ³ TWA respirable fraction | None |
| Cobalt - 7440-48-4 | 0.1 mg/m ³ TWA | 0.05 mg/m ³ TWA | 0.02 mg/m ³ TWA | None |
| Copper Metal - 7440-50-8 | 0.1 mg/m ³ TWA | 1 mg/m ³ TWA 0.1 mg/m ³ TWA | 0.2 mg/m ³ TWA fume | None |

| | | | | |
|----------------------|--|---------------------------|------|------|
| Vanadium - 7440-62-2 | 0.5 mg/m ³ Ceiling 0.1 mg/m ³ Ceiling | = 1 mg/m ³ TWA | None | None |
| Zinc - 7440-66-6 | None | None | None | None |

Canada

| Components | Alberta | British Columbia | Ontario | Quebec |
|--|---|---|---|---|
| Water - 7732-18-5 | None | None | None | None |
| Nitric acid - 7697-37-2 | 2 ppm TWA 5.2 mg/m ³ TWA 4 ppm STEL 10 mg/m ³ STEL | 2 ppm TWA 4 ppm STEL | 2 ppm TWA 4 ppm STEL | 2 ppm TWAEV 5.2 mg/m ³ TWAEV 4 ppm STEV 10 mg/m ³ STEV |
| Selenium - 7782-49-2 | 0.2 mg/m ³ TWA | 0.1 mg/m ³ TWA | 0.2 mg/m ³ TWA | 0.2 mg/m ³ TWAEV |
| Chromium Nitrate nonahydrate - 7789-02-8 | None | None | None | None |
| Antimony Trioxide - 1309-64-4 | None | None | None | 0.5 mg/m ³ TWAEV Sb |
| Ammonium Molybdate - 13106-76-8 | None | None | None | None |
| Ammonium Hexafluorotitanate - 16962-40-6 | None | None | None | None |
| Calcium Carbonate - 471-34-1 | 10 mg/m ³ TWA | None | None | 10 mg/m ³ TWAEV total dust |
| Iron Metal - 7439-89-6 | None | None | None | None |
| Lead - 7439-92-1 | 0.05 mg/m ³ TWA | 0.05 mg/m ³ TWA | 0.05 mg/m ³ TWA | 0.05 mg/m ³ TWAEV |
| Magnesium - 7439-95-4 | None | None | None | None |
| Manganese Metal, powder - 7439-96-5 | 0.2 mg/m ³ TWA | 0.2 mg/m ³ TWA | 0.2 mg/m ³ TWA | 0.2 mg/m ³ TWAEV total dust and fume |
| Nickel - 7440-02-0 | 1.5 mg/m ³ TWA | 0.05 mg/m ³ TWA | 1 mg/m ³ TWA inhalable | 1 mg/m ³ TWAEV |
| Thallium - 7440-28-0 | = 0.1 mg/m ³ TWA | = 0.1 mg/m ³ TWA | 0.1 mg/m ³ TWA | 0.1 mg/m ³ TWAEV |
| Arsenic - 7440-38-2 | 0.01 mg/m ³ TWA | 0.01 mg/m ³ TWA | 0.01 mg/m ³ TWA | 0.1 mg/m ³ TWAEV |
| Beryllium - 7440-41-7 | 0.002 mg/m ³ TWA 0.01 mg/m ³ STEL | 0.002 mg/m ³ TWA 0.01 mg/m ³ STEL | 0.002 mg/m ³ TWA | 0.00015 mg/m ³ TWAEV |
| Cadmium - 7440-43-9 | 0.01 mg/m ³ TWA | 0.01 mg/m ³ TWA 0.002 mg/m ³ TWA respirable | 0.01 mg/m ³ TWA 0.002 mg/m ³ TWA respirable | 0.025 mg/m ³ TWAEV |
| Cobalt - 7440-48-4 | 0.02 mg/m ³ TWA | 0.02 mg/m ³ TWA | 0.02 mg/m ³ TWA | 0.02 mg/m ³ TWAEV |
| Copper Metal - 7440-50-8 | 0.2 mg/m ³ TWA fume 1 mg/m ³ TWA dust and mist | 1 mg/m ³ TWA dust and mist 0.2 mg/m ³ TWA fume | 0.2 mg/m ³ TWA fume 1 mg/m ³ TWA dust and mist | 0.2 mg/m ³ TWAEV fume 1 mg/m ³ TWAEV dust and mist |
| Vanadium - 7440-62-2 | None | None | None | None |
| Zinc - 7440-66-6 | None | None | None | None |

Australia and Mexico

| Components | Australia | Mexico |
|---|---|---|
| Water 7732-18-5 | None | None |
| Nitric acid 7697-37-2 | 4 ppm STEL 10 mg/m ³ STEL 2 ppm TWA 5.2 mg/m ³ TWA | 2 ppm TWA 5 mg/m ³ TWA 4 ppm STEL 10 mg/m ³ STEL |
| Selenium 7782-49-2 | 0.1 mg/m ³ TWA | None |
| Chromium Nitrate nonahydrate 7789-02-8 | None | None |

| | | |
|---|--|--|
| Antimony Trioxide 1309-64-4 | probable carcinogen | 0.5 mg/m ³ TWA 1 mg/m ³ TWA |
| Ammonium Molybdate 13106-76-8 | None | None |
| Ammonium Hexafluorotitanate 16962-40-6 | None | None |
| Calcium Carbonate 471-34-1 | 10 mg/m ³ TWA | None |
| Iron Metal 7439-89-6 | None | None |
| Lead 7439-92-1 | 0.15 mg/m ³ TWA | 0.15 mg/m ³ TWA |
| Magnesium 7439-95-4 | None | None |
| Manganese Metal, powder 7439-96-5 | 3 mg/m ³ STEL 1 mg/m ³ TWA | 0.2 mg/m ³ TWA 1 mg/m ³ TWA 3 mg/m ³ STEL |
| Nickel 7440-02-0 | 1 mg/m ³ TWA | 1 mg/m ³ TWA |
| Thallium 7440-28-0 | None | None |
| Arsenic 7440-38-2 | confirmed carcinogen | 0.01 mg/m ³ TWA |
| Beryllium 7440-41-7 | probable carcinogen | 0.002 mg/m ³ TWA |
| Cadmium 7440-43-9 | probable carcinogen | 0.01 mg/m ³ TWA 0.002 mg/m ³ TWA |
| Cobalt 7440-48-4 | 0.05 mg/m ³ TWA | 0.1 mg/m ³ TWA |
| Copper Metal 7440-50-8 | 1 mg/m ³ TWA 0.2 mg/m ³ TWA | 0.2 mg/m ³ TWA 1 mg/m ³ TWA 2 mg/m ³ STEL |
| Vanadium 7440-62-2 | None | None |
| Zinc 7440-66-6 | None | None |

Appropriate engineering controls

Engineering measures to reduce exposure:

Ensure adequate ventilation. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors and mist below their respective threshold limit value.

Individual protection measures, such as personal protective equipment

Personal Protective Equipment

- Eye protection:** Goggles. Face-shield.
- Skin and body protection:** Chemical resistant protective suit. Gloves. boots.
- Respiratory protection:** Vapor respirator. Be sure to use an approved/certified respirator or equivalent.
- Hygiene measures:** Avoid contact with skin, eyes and clothing. When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES

9. PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|--|---|---|
| Physical state: Liquid. | Appearance: No information available | Color: Colorless. |
| Odor: No information available | Taste No information available | Formula: No information available |
| Molecular/Formula weight: No information available | Flash point (°C): No data available | Flashpoint (°C/°F): The product is not flammable |
| Flash Point Tested according to: Not available | Lower Explosion Limit (%): No information available | Upper Explosion Limit (%): No information available |
| Autoignition Temperature (°C/°F): No information available | pH: No information available | Melting point/range(°C/°F): No information available |
| Boiling point/range(°C/°F): No information available | Decomposition temperature(°C/°F): No information available | Specific gravity: No information available |
| Density (g/cm3): No information available | Bulk density: No information available | Vapor pressure @ 20°C (kPa): No information available |
| Evaporation rate: No information available | Vapor density: No information available | VOC content (g/L): No information available |
| Odor threshold (ppm): No information available | Partition coefficient (n-octanol/water): No information available | Viscosity: No information available |
| Miscibility: No information available | Solubility: No information available | |

10. STABILITY AND REACTIVITY

Reactivity

Reacts with reducing agents
Reactive with metals
Reacts with bases

Chemical stability

Stability: Stable.

Possibility of Hazardous Reactions: Hazardous polymerization does not occur

Conditions to avoid: Incompatible materials.

Incompatible Materials: Bases. Reducing agents. Metals. Powdered metals.

Hazardous decomposition products: Nitrogen oxides (NOx).

Other Information

Corrosivity: No information available

Special Remarks on Corrosivity: No information available

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product code: PM470

Product name: ICP QUALITY
CONTROL STANDARD, SOLUTION I

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Principal Routes of Exposure:
Skin. Inhalation. Ingestion.

Acute Toxicity

Component Information

Water - 7732-18-5

LD50/oral/rat = > 90 mL/kg Oral LD50 Rat
LD50/oral/mouse = No information available
LD50/dermal/rabbit = No information available
LD50/dermal/rat = No information available
LC50/inhalation/rat = No information available
LC50/inhalation/mouse = No information available
Other LD50 or LC50 information = No information available

Nitric acid - 7697-37-2

LD50/oral/rat = No information available
LD50/oral/mouse = No information available
LD50/dermal/rabbit = No information available
LD50/dermal/rat = No information available
LC50/inhalation/rat = 67 ppm Inhalation LC50 Rat 4 h
130 mg/m³ 4 h
7 mg/l 1 h
LC50/inhalation/mouse = No information available
Other LD50 or LC50 information = 430 mg/kg Oral LD Rat

Selenium - 7782-49-2

LD50/oral/rat = No information available
LD50/oral/mouse = No information available
LD50/dermal/rabbit = No information available
LD50/dermal/rat = No information available
LC50/inhalation/rat = No information available
LC50/inhalation/mouse = No information available
Other LD50 or LC50 information = No information available

Chromium Nitrate nonahydrate - 7789-02-8

LD50/oral/rat = = 3250 mg/kg Oral LD50 Rat
LD50/oral/mouse = No information available
LD50/dermal/rabbit = No information available
LD50/dermal/rat = No information available
LC50/inhalation/rat = No information available
LC50/inhalation/mouse = No information available
Other LD50 or LC50 information = No information available

Antimony Trioxide - 1309-64-4

LD50/oral/rat = 34600 mg/kg Oral LD50 Rat
LD50/oral/mouse = No information available
LD50/dermal/rabbit = No information available
LD50/dermal/rat = No information available
LC50/inhalation/rat = No information available
LC50/inhalation/mouse = No information available

Other LD50 or LC50information = No information available

Ammonium Molybdate - 13106-76-8

LD50/oral/rat = No information available
LD50/oral/mouse = No information available
LD50/dermal/rabbit = No information available
LD50/dermal/rat = No information available
LC50/inhalation/rat = No information available
LC50/inhalation/mouse = No information available
Other LD50 or LC50information = No information available

Ammonium Hexafluorotitanate - 16962-40-6

LD50/oral/rat = No information available
LD50/oral/mouse = No information available
LD50/dermal/rabbit = No information available
LD50/dermal/rat = No information available
LC50/inhalation/rat = No information available
LC50/inhalation/mouse = No information available
Other LD50 or LC50information = No information available

Calcium Carbonate - 471-34-1

LD50/oral/rat = 6450 mg/kg Oral LD50 Rat
LD50/oral/mouse = No information available
LD50/dermal/rabbit = No information available
LD50/dermal/rat = No information available
LC50/inhalation/rat = No information available
LC50/inhalation/mouse = No information available
Other LD50 or LC50information = No information available

Iron Metal - 7439-89-6

LD50/oral/rat = 984 mg/kg Oral LD50 Rat (LOLI)
30000 mg/kg (RTECS)
LD50/oral/mouse = No information available
LD50/dermal/rabbit = No information available
LD50/dermal/rat = No information available
LC50/inhalation/rat = No information available
LC50/inhalation/mouse = No information available
Other LD50 or LC50information = 20000 mg/kg Oral LD50 Guinea pig

Lead - 7439-92-1

LD50/oral/rat = No information available
LD50/oral/mouse = No information available
LD50/dermal/rabbit = No information available
LD50/dermal/rat = No information available
LC50/inhalation/rat = No information available
LC50/inhalation/mouse = No information available
Other LD50 or LC50information = No information available

Magnesium - 7439-95-4

LD50/oral/rat = = 230 mg/kg Oral LD50 Rat
LD50/oral/mouse = No information available
LD50/dermal/rabbit = No information available
LD50/dermal/rat = No information available
LC50/inhalation/rat = No information available

LC50/inhalation/mouse = No information available
Other LD50 or LC50information = No information available

Manganese Metal, powder - 7439-96-5

LD50/oral/rat = 9000 mg/kg (RTECS)
LD50/oral/mouse = No information available
LD50/dermal/rabbit = No information available
LD50/dermal/rat = No information available
LC50/inhalation/rat = No information available
LC50/inhalation/mouse = No information available
Other LD50 or LC50information = No information available

Nickel - 7440-02-0

LD50/oral/rat = >9000 mg/kg Oral LD50 Rat
LD50/oral/mouse = No information available
LD50/dermal/rabbit = No information available
LD50/dermal/rat = No information available
LC50/inhalation/rat = No information available
LC50/inhalation/mouse = No information available
Other LD50 or LC50information = No information available

Thallium - 7440-28-0

LD50/oral/rat = No information available
LD50/oral/mouse = No information available
LD50/dermal/rabbit = No information available
LD50/dermal/rat = No information available
LC50/inhalation/rat = No information available
LC50/inhalation/mouse = No information available
Other LD50 or LC50information = No information available

Arsenic - 7440-38-2

LD50/oral/rat = 15 mg/kg Oral LD50 Rat (LOLI)
763 mg/kg (RTECS)
LD50/oral/mouse = 145 mg/kg
LD50/dermal/rabbit = No information available
LD50/dermal/rat = No information available
LC50/inhalation/rat = No information available
LC50/inhalation/mouse = No information available
Other LD50 or LC50information = No information available

Beryllium - 7440-41-7

LD50/oral/rat = No information available
LD50/oral/mouse = No information available
LD50/dermal/rabbit = No information available
LD50/dermal/rat = No information available
LC50/inhalation/rat = No information available
LC50/inhalation/mouse = No information available
Other LD50 or LC50information = No information available

Cadmium - 7440-43-9

LD50/oral/rat = = 2330 mg/kg Oral LD50 Rat (RTECS and EU Commission IUCLID dataset)
LD50/oral/mouse = 890 mg/kg
LD50/dermal/rabbit = No information available
LD50/dermal/rat = No information available

LC50/inhalation/rat = 25 mg/m³ Inhalation LC50 Rat 30 min
LC50/inhalation/mouse = No information available
Other LD50 or LC50information = No information available

Cobalt - 7440-48-4

LD50/oral/rat = 6170 mg/kg Oral LD50 Rat
LD50/oral/mouse = No information available
LD50/dermal/rabbit = No information available
LD50/dermal/rat = No information available
LC50/inhalation/rat = 10 mg/L Inhalation LC50 Rat 1 h
LC50/inhalation/mouse = No information available
Other LD50 or LC50information = No information available

Copper Metal - 7440-50-8

LD50/oral/rat = No information available
LD50/oral/mouse = No information available
LD50/dermal/rabbit = No information available
LD50/dermal/rat = No information available
LC50/inhalation/rat = No information available
LC50/inhalation/mouse = No information available
Other LD50 or LC50information = No information available

Vanadium - 7440-62-2

LD50/oral/rat = No information available
LD50/oral/mouse = No information available
LD50/dermal/rabbit = No information available
LD50/dermal/rat = No information available
LC50/inhalation/rat = No information available
LC50/inhalation/mouse = No information available
Other LD50 or LC50information = No information available

Zinc - 7440-66-6

LD50/oral/rat = No information available
LD50/oral/mouse = No information available
LD50/dermal/rabbit = No information available
LD50/dermal/rat = No information available
LC50/inhalation/rat = No information available
LC50/inhalation/mouse = No information available
Other LD50 or LC50information = No information available

Product Information

LD50/oral/rat =
VALUE- Acute Tox Oral = No information available

LD50/oral/mouse =
Value - Acute Tox Oral = No information available

LD50/dermal/rabbit
VALUE-Acute Tox Dermal = No information available

LD50/dermal/rat
VALUE -Acute Tox Dermal = No information available

LC50/inhalation/rat
VALUE-Vapor = No information available

VALUE-Gas = No information available
 VALUE-Dust/Mist = No information available

LC50/Inhalation/mouse

VALUE-Vapor = No information available
 VALUE - Gas = No information available
 VALUE - Dust/Mist = No information available

Symptoms

Skin Contact: Severe skin irritation. Causes skin burns. May cause deep penetrating ulcers of the skin with a characteristic yellow to brownish discoloration.

Eye Contact: Severe eye irritation. Causes eye burns. May cause irreversible eye damage.

Inhalation Causes irritation and possible burns of the respiratory tract with burning pain in the nose and throat, coughing, sneezing, wheezing, shortness of breath and pulmonary edema. Other symptoms may include nausea, and vomiting.

Ingestion Causes serious gastrointestinal tract irritation or burns with nausea, vomiting, severe abdominal pain, and possible "coffee grounds" appearance of the vomitus . May cause perforation of the digestive tract.

Aspiration hazard No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Chronic Toxicity Repeated inhalation may produce changes in pulmonary function and/or chronic bronchitis. It may also cause weight loss, and affect behavior/central nervous system (headache, dizziness, drowsiness, muscle contaction or spasticity, weakness, loss of coordinaton, mental confusion), and urinary system (kidney failure, decreased urinary output after several hours of uncorrected circulatory collapse).
 Repeated exposure may cause discoloration and/or errosion of teeth (dental enamel).
 Eye irritation and respiratory tract signs and symptoms resembling those of frequent upper respiratory viral infections have been associated with chronic nitric acid exposure

Sensitization: No information available

Mutagenic Effects: No information available

Carcinogenic effects: Not considered carcinogenic

| Components | ACGIH - Carcinogens | IARC | NTP | OSHA HCS - Carcinogens | Australia - Prohibited Carcinogenic Substances | Australia - Notifiable Carcinogenic Substances |
|------------------------------|-------------------------------|--|------------|------------------------|--|--|
| Water | Not listed | Not listed | Not listed | Not listed | Not listed | Not listed |
| Nitric acid | Not listed | Not listed | Not listed | Not listed | Not listed | Not listed |
| Selenium | Not listed | Group 3 - Supplement 7 [1987] Monograph 9 [1975] | Not listed | Not listed | Not listed | Not listed |
| Chromium Nitrate nonahydrate | Not listed | Not listed | Not listed | Not listed | Not listed | Not listed |
| Antimony Trioxide | A2 Suspected Human Carcinogen | Group 2B - Monograph 47 [1989] | Not listed | Present | Not listed | Not listed |
| Ammonium Molybdate | Not listed | Not listed | Not listed | Not listed | Not listed | Not listed |
| Ammonium Hexafluorotitanate | Not listed | Not listed | Not listed | Not listed | Not listed | Not listed |

| | | | | | | |
|-------------------------|---|---|--|------------------------------|------------|------------|
| Calcium Carbonate | Not listed | Not listed | Not listed | Not listed | Not listed | Not listed |
| Iron Metal | Not listed | Not listed | Not listed | Not listed | Not listed | Not listed |
| Lead | A3 Confirmed Animal Carcinogen with Unknown Relevance to Humans | Group 2B - Monograph 87 [2006] evaluates inorganic lead compounds as Group 2A and organic lead compounds as Group 3 | Reasonably Anticipated To Be A Human Carcinogen | Present | Not listed | Not listed |
| Magnesium | Not listed | Not listed | Not listed | Not listed | Not listed | Not listed |
| Manganese Metal, powder | A4 Not Classifiable as a Human Carcinogen | Not listed | Not listed | Not listed | Not listed | Not listed |
| Nickel | A5 Not Suspected as a Human Carcinogen | Group 2B - Monograph 49 [1990] Supplement 7 [1987] | Reasonably Anticipated To Be A Human Carcinogen | Present | Not listed | Not listed |
| Thallium | Not listed | Not listed | Not listed | Not listed | Not listed | Not listed |
| Arsenic | A1 Confirmed Human Carcinogen | Group 1 - Monograph 100C [2012] Monograph 84 [2004] in drinking water Supplement 7 [1987] Monograph 23 [1980] | Known Human Carcinogen Arsenic and Inorganic Arsenic Compounds | Present | Not listed | Not listed |
| Beryllium | A1 Confirmed Human Carcinogen | Group 1 - Monograph 100C [2012] Monograph 58 [1993] Supplement 7 [1987] | Known Human Carcinogen Beryllium and Beryllium Compounds | Present | Not listed | Not listed |
| Cadmium | A2 Suspected Human Carcinogen | Group 1 - Monograph 100C [2012] Monograph 58 [1993] Supplement 7 [1987] | Known Human Carcinogen Cadmium and Cadmium Compounds | Present see 29 CFR 1910.1027 | Not listed | Not listed |
| Cobalt | A3 Confirmed Animal Carcinogen with Unknown Relevance to Humans | IARC 2B - Monograph 86 [2006] without tungsten carbide Monograph 52 [1991] Monograph 86 [2006] without tungsten carbide | Not listed | Present | Not listed | Not listed |
| Copper Metal | Not listed | Not listed | Not listed | Not listed | Not listed | Not listed |
| Vanadium | Not listed | Not listed | Not listed | Not listed | Not listed | Not listed |
| Zinc | Not listed | Not listed | Not listed | Not listed | Not listed | Not listed |

Reproductive toxicity

No data is available

Reproductive Effects:

No information available

Developmental Effects:

May cause developmental effects based on animal data

Teratogenic Effects:

No information available

Specific Target Organ Toxicity

STOT - single exposure No information available
STOT - repeated exposure No information available
Target Organs: Skin. Eyes. Respiratory system.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity effects: Aquatic environment.

Antimony Trioxide - 1309-64-4

Freshwater Algae Data: 0.63 - 0.8 mg/L EC50 Pseudokirchneriella subcapitata 72 h
0.65 - 0.81 mg/L EC50 Pseudokirchneriella subcapitata 96 h

Freshwater Fish Species Data: 1000 mg/L LC50 Brachydanio rerio 96 h static 1
80 mg/L LC50 Pimephales promelas 96 h static 1

Water Flea Data: 361.5 - 496.0 mg/L EC50 Daphnia magna 48 h
1000 mg/L EC50 Daphnia magna 48 h

Lead - 7439-92-1

Freshwater Fish Species Data: 0.44 mg/L LC50 Cyprinus carpio 96 h semi-static 1
1.17 mg/L LC50 Oncorhynchus mykiss 96 h flow-through 1
1.32 mg/L LC50 Oncorhynchus mykiss 96 h static 1

Water Flea Data: 600 µg/L EC50 water flea 48 h

Nickel - 7440-02-0

Freshwater Algae Data: 0.174 - 0.311 mg/L EC50 Pseudokirchneriella subcapitata 96 h
0.18 mg/L EC50 Pseudokirchneriella subcapitata 72 h

Freshwater Fish Species Data: 1.3 mg/L LC50 Cyprinus carpio 96 h semi-static 1
10.4 mg/L LC50 Cyprinus carpio 96 h static 1
100 mg/L LC50 Brachydanio rerio 96 h 1

Water Flea Data: 1 mg/L EC50 Daphnia magna 48 h
100 mg/L EC50 Daphnia magna 48 h

Cadmium - 7440-43-9

Freshwater Fish Species Data: 0.0004 - 0.003 mg/L LC50 Pimephales promelas 96 h 1
0.002 mg/L LC50 Cyprinus carpio 96 h 1
0.003 mg/L LC50 Oncorhynchus mykiss 96 h flow-through 1
0.006 mg/L LC50 Oncorhynchus mykiss 96 h static 1
0.016 mg/L LC50 Oryzias latipes 96 h 1

0.24 mg/L LC50 Cyprinus carpio 96 h static 1
21.1 mg/L LC50 Lepomis macrochirus 96 h flow-through 1
4.26 mg/L LC50 Cyprinus carpio 96 h semi-static 1
Water Flea Data: 0.0244 mg/L EC50 Daphnia magna 48 h

Cobalt - 7440-48-4

Freshwater Fish Species Data: 100 mg/L LC50 Brachydanio rerio 96 h static 1

Copper Metal - 7440-50-8

Freshwater Algae Data: 0.031 - 0.054 mg/L EC50 Pseudokirchneriella subcapitata 96 h
0.0426 - 0.0535 mg/L EC50 Pseudokirchneriella subcapitata 72 h

Antimony Trioxide - 1309-64-4

Freshwater Fish Species Data: 0.0068 - 0.0156 mg/L LC50 Pimephales promelas 96 h 1
 0.3 mg/L LC50 Pimephales promelas 96 h static 1
 0.052 mg/L LC50 Oncorhynchus mykiss 96 h flow-through 1
 0.112 mg/L LC50 Poecilia reticulata 96 h flow-through 1
 0.2 mg/L LC50 Pimephales promelas 96 h flow-through 1
 0.3 mg/L LC50 Cyprinus carpio 96 h semi-static 1
 0.8 mg/L LC50 Cyprinus carpio 96 h static 1
 1.25 mg/L LC50 Lepomis macrochirus 96 h static 1
Water Flea Data: 0.03 mg/L EC50 Daphnia magna 48 h

Zinc - 7440-66-6

Freshwater Algae Data: 0.09 - 0.125 mg/L EC50 Pseudokirchneriella subcapitata 72 h
 0.11 - 0.271 mg/L EC50 Pseudokirchneriella subcapitata 96 h
Freshwater Fish Species Data: 0.211 - 0.269 mg/L LC50 Pimephales promelas 96 h semi-static 1
 2.16 - 3.05 mg/L LC50 Pimephales promelas 96 h flow-through 1
 0.24 mg/L LC50 Oncorhynchus mykiss 96 h flow-through 1
 0.41 mg/L LC50 Oncorhynchus mykiss 96 h static 1
 0.45 mg/L LC50 Cyprinus carpio 96 h semi-static 1
 0.59 mg/L LC50 Oncorhynchus mykiss 96 h semi-static 1
 2.66 mg/L LC50 Pimephales promelas 96 h static 1
 3.5 mg/L LC50 Lepomis macrochirus 96 h static 1
 30 mg/L LC50 Cyprinus carpio 96 h 1
 7.8 mg/L LC50 Cyprinus carpio 96 h static 1
Water Flea Data: 0.139 - 0.908 mg/L EC50 Daphnia magna 48 h

Persistence and degradability: No information available

Bioaccumulative potential: No information available

Mobility: No information available

13. DISPOSAL CONSIDERATIONS

Disposal Methods

Waste from residues / unused products:

Waste must be disposed of in accordance with Federal, State and Local regulation.

Contaminated packaging:

Empty containers should be taken for local recycling, recovery or waste disposal

| Components | RCRA - F Series Wastes | RCRA - K Series Wastes | RCRA - P Series Wastes | RCRA - U Series Wastes |
|------------------------------|------------------------|------------------------|------------------------|------------------------|
| Water | None | None | None | None |
| Nitric acid | None | None | None | None |
| Selenium | None | None | None | None |
| Chromium Nitrate nonahydrate | None | None | None | None |
| Antimony Trioxide | None | None | None | None |
| Ammonium Molybdate | None | None | None | None |
| Ammonium Hexafluorotitanate | None | None | None | None |
| Calcium Carbonate | None | None | None | None |
| Iron Metal | None | None | None | None |
| Lead | None | None | None | None |
| Magnesium | None | None | None | None |
| Manganese Metal, powder | None | None | None | None |
| Nickel | None | None | None | None |

| Components | RCRA - F Series Wastes | RCRA - K Series Wastes | RCRA - P Series Wastes | RCRA - U Series Wastes |
|--------------|------------------------|------------------------|------------------------|------------------------|
| Thallium | None | None | None | None |
| Arsenic | None | None | None | None |
| Beryllium | None | None | P015 powder | None |
| Cadmium | None | None | None | None |
| Cobalt | None | None | None | None |
| Copper Metal | None | None | None | None |
| Vanadium | None | None | None | None |
| Zinc | None | None | None | None |

14. TRANSPORT INFORMATION

DOT

UN-No: UN2031
Proper Shipping Name: Nitric acid (Solution)
Hazard Class: 8
Subsidiary Risk: Not applicable
Packing Group: II
ERG No: 157
Marine Pollutant: No data available
DOT RQ (lbs): No information available

TDG (Canada)

UN-No: UN2031
Proper Shipping Name: Nitric acid (Solution)
Hazard Class: 8
Subsidiary Risk: No information available
Packing Group: II
Description: No information available

ADR

UN-No: UN2031
Proper Shipping Name: Nitric acid (Solution)
Hazard Class: 8
Packing Group: II
Subsidiary Risk: No information available
Classification Code: No information available
Description: No information available
CEFIC Tremcard No: No information available

IMO / IMDG

UN-No: UN2031
Proper Shipping Name: Nitric acid (Solution)
Hazard Class: 8
Subsidiary Risk: No information available
Packing Group: II
Description: No information available
IMDG Page: No information available
Marine Pollutant: No information available
EMS: F-A
MFAG: No information available
Maximum Quantity: No information available

RID

UN-No: UN2031
Proper Shipping Name: Nitric acid (Solution)

14. TRANSPORT INFORMATION

Hazard Class: 8
Subsidiary Risk: 8
Packing Group: II
Classification Code: No information available
Description: No information available

ICAO

UN-No: UN2031
Proper Shipping Name: Nitric acid (Solution)
Hazard Class: 8
Subsidiary Risk: No information available
Packing Group: II
Description: No information available

IATA

UN-No: UN2031
Proper Shipping Name: Nitric acid (Solution)
Hazard Class: 8
Subsidiary Risk: No information available
Packing Group: II
ERG Code: 8L
Description: No information available

15. REGULATORY INFORMATION

International Inventories

| Components | U.S. TSCA | KOREA KECL | Philippines (PICCS) | Japan ENCS | CHINA | Australia (AICS) | EINECS-No. |
|-------------------------------------|------------|------------------|---------------------|-----------------|-------------|------------------|-------------------|
| <i>Water</i> | Present | Present KE-35400 | Present | Not present | Present | Present | Present 231-791-2 |
| <i>Nitric acid</i> | Present | Present KE-25911 | Present | Present (1)-394 | Present | Present | Present 231-714-2 |
| <i>Selenium</i> | Present | Present KE-30924 | Present | Not present | Present | Present | Present 231-957-4 |
| <i>Chromium Nitrate nonahydrate</i> | Not Listed | Not present | Not present | Present (1)-281 | Present | Present | Not present |
| <i>Antimony Trioxide</i> | Present | Present KE-09846 | Present | Present (1)-543 | Present | Present | Present 215-175-0 |
| <i>Ammonium Molybdate</i> | Not Listed | Not present | Not present | Not present | Not present | Not present | Not present |
| <i>Ammonium Hexafluorotitanate</i> | Not Listed | Not present | Not present | Not present | Not present | Not present | Not present |
| <i>Calcium Carbonate</i> | Present | Present KE-04487 | Present | Present (1)-122 | Present | Present | Present 207-439-9 |
| <i>Iron Metal</i> | Present | Present KE-21059 | Present | Not present | Present | Present | Present 231-096-4 |
| <i>Lead</i> | Present | Present KE-21887 | Present | Present (1)-527 | Present | Present | Present 231-100-4 |
| <i>Magnesium</i> | Present | Present KE-22673 | Present | Not present | Present | Present | Present 231-104-6 |
| <i>Manganese Metal, powder</i> | Present | Present KE-22999 | Present | Not present | Present | Present | Present 231-105-1 |
| <i>Nickel</i> | Present | Present KE-25818 | Present | Not present | Present | Present | Present 231-111-4 |
| <i>Thallium</i> | Present | Present KE-33716 | Present | Not present | Present | Present | Present 231-138-1 |
| <i>Arsenic</i> | Present | Present KE-01933 | Present | Not present | Present | Present | Present 231-148-6 |
| <i>Beryllium</i> | Present | Present KE-02829 | Present | Not present | Present | Present | Present 231-150-7 |
| <i>Cadmium</i> | Present | Present KE-04397 | Present | Not present | Present | Present | Present 231-152-8 |
| <i>Cobalt</i> | Present | Present KE-06060 | Present | Not present | Present | Present | Present 231-158-0 |

| Components | U.S. TSCA | KOREA KECL | Philippines (PICCS) | Japan ENCS | CHINA | Australia (AICS) | EINECS-No. |
|--------------|-----------|------------------|---------------------|-------------|---------|------------------|-------------------|
| Copper Metal | Present | Present KE-08896 | Present | Not present | Present | Present | Present 231-159-6 |
| Vanadium | Present | Present KE-35266 | Present | Not present | Present | Present | Present 231-171-1 |
| Zinc | Present | Present KE-35518 | Present | Not present | Present | Present | Present 231-175-3 |

U.S. Regulations

Nitric acid

Massachusetts RTK: Present

Massachusetts EHS: extraordinarily hazardous

New Jersey RTK Hazardous Substance List: Present

New Jersey (EHS) List: Present

New Jersey - Discharge Prevention - List of Hazardous Substances: Present

New Jersey TCPA - EHS: 15000lbTQ

450lbTQ

Pennsylvania RTK: Environmental hazard

Pennsylvania RTK - Environmental Hazard List Present

Michigan PSM HHC: = 500 lb TQ 94.5% by weight or greater

Minnesota - Hazardous Substance List: Present

New York Release Reporting - List of Hazardous Substances:

1000 lb RQ

100 lb RQ

Louisiana Reportable Quantity List for Pollutants: 1000lbfinal RQAs listed in 40 CFR 117.3 Table 117.3 and 40 CFR 302.4 Table 302.4

454kgfinal RQAs listed in 40 CFR 117.3 Table 117.3 and 40 CFR 302.4 Table 302.4

1000lbRQAs listed in Louisiana Administrative Code, Title 33, Part 1, Subpart 2, Chapter 39, Subchapter E. Applies to unauthorized emissions based on total mass emitted into or onto all media within any consecutive 24-hour period

100lbRQAs listed in Louisiana Administrative Code, Title 33, Part 1, Subpart 2, Chapter 39, Subchapter E. Applies to unauthorized emissions based on total mass emitted into the atmosphere

California Directors List of Hazardous Substances: Present

Selenium

Massachusetts RTK: Present

New Jersey RTK Hazardous Substance List: Present

New Jersey (EHS) List: Present

New Jersey - Discharge Prevention - List of Hazardous Substances: Present

Pennsylvania RTK: Environmental hazard

Pennsylvania RTK - Environmental Hazard List Present

RI RTK - Hazardous Substances List: Present

Michigan - Critical Materials List: Present

New York Release Reporting - List of Hazardous Substances:

100 lb RQ

Louisiana Reportable Quantity List for Pollutants: 100lbfinal RQno reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is $\geq 100 \mu\text{m}$

45.4kgfinal RQno reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is $\geq 100 \mu\text{m}$

California Directors List of Hazardous Substances: Present

Antimony Trioxide

Massachusetts RTK: Present

New Jersey RTK Hazardous Substance List: Present

New Jersey - Discharge Prevention - List of Hazardous Substances: Present

Pennsylvania RTK: Environmental hazard

Pennsylvania RTK - Environmental Hazard List Present

RI RTK - Hazardous Substances List: Present

Minnesota - Hazardous Substance List: Present

New York Release Reporting - List of Hazardous Substances:

1000 lb RQ

100 lb RQ

Louisiana Reportable Quantity List for Pollutants: 1000lbfinal RQ

454kgfinal RQ

California Directors List of Hazardous Substances: Present

Calcium Carbonate

FDA - Food Additives Generally Recognized as Safe (GRAS): 21 CFR 184.1191

Iron Metal

California Directors List of Hazardous Substances: Present

Nitric acid

FDA - Food Additives Generally Recognized as Safe (GRAS): 21 CFR 184.1375

Lead

Massachusetts RTK: Present
New Jersey RTK Hazardous Substance List: Present
New Jersey (EHS) List: Present
New Jersey - Discharge Prevention - List of Hazardous Substances: Present
Pennsylvania RTK: Environmental hazard
Pennsylvania RTK - Environmental Hazard List Present
RI RTK - Hazardous Substances List: Present
Michigan - Critical Materials List: Present
Minnesota - Hazardous Substance List: Present
New York Release Reporting - List of Hazardous Substances:
10 lb RQ
Louisana Reportable Quantity List for Pollutants: 10lbfinal RQno reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is $\geq 100 \mu\text{m}$
4.54kgfinal RQno reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is $\geq 100 \mu\text{m}$
California Directors List of Hazardous Substances: Present

Magnesium

Massachusetts RTK: Present
New Jersey RTK Hazardous Substance List: Present
Pennsylvania RTK: Present
RI RTK - Hazardous Substances List: Present
California Directors List of Hazardous Substances: Present

Manganese Metal, powder

Massachusetts RTK: Present
New Jersey RTK Hazardous Substance List: Present
New Jersey (EHS) List: Present
New Jersey - Discharge Prevention - List of Hazardous Substances: Present
Pennsylvania RTK: Environmental hazard
Pennsylvania RTK - Environmental Hazard List Present
RI RTK - Hazardous Substances List: Present
Minnesota - Hazardous Substance List: Present
Louisana Reportable Quantity List for Pollutants: 100lbRQno reporting required if diameter of solid metal pieces released is $\geq 100 \mu\text{m}$
California Directors List of Hazardous Substances: Present

Nickel

Massachusetts RTK: Present
Massachusetts EHS: carcinogen; extraordinarily hazardous
New Jersey RTK Hazardous Substance List: Present
New Jersey (EHS) List: Present
New Jersey - Discharge Prevention - List of Hazardous Substances: Present
Pennsylvania RTK: Environmental hazard
Special hazardous substance
Pennsylvania RTK - Environmental Hazard List Present
Pennsylvania RTK - Special Hazardous Substances Present
RI RTK - Hazardous Substances List: Present
Michigan - Critical Materials List: Present
Minnesota - Hazardous Substance List: Present
New York Release Reporting - List of Hazardous Substances:
100 lb RQ
Louisana Reportable Quantity List for Pollutants: 100lbfinal RQno reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is $\geq 100 \mu\text{m}$
45.4kgfinal RQno reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is $\geq 100 \mu\text{m}$
California Directors List of Hazardous Substances: Present
FDA - Food Additives Generally Recognized as Safe (GRAS): 21 CFR 184.1537

Thallium

Massachusetts RTK: Present
New Jersey RTK Hazardous Substance List: Present
New Jersey (EHS) List: Present
New Jersey - Discharge Prevention - List of Hazardous Substances: Present
Pennsylvania RTK: Environmental hazard
Pennsylvania RTK - Environmental Hazard List Present
Pennsylvania RTK - Special Hazardous Substances Present
RI RTK - Hazardous Substances List: Present

Nitric acid

New York Release Reporting - List of Hazardous Substances:

= 100 lb RQ
= 1000 lb RQ

Louisiana Reportable Quantity List for Pollutants: Listed

California Directors List of Hazardous Substances: Present

Arsenic

Massachusetts RTK: Present

New Jersey RTK Hazardous Substance List: Present

New Jersey (EHS) List: Present

New Jersey - Discharge Prevention - List of Hazardous Substances: Present

Pennsylvania RTK: Environmental hazard

Special hazardous substance

Pennsylvania RTK - Environmental Hazard List Present

Pennsylvania RTK - Special Hazardous Substances Present

RI RTK - Hazardous Substances List: Present

Michigan - Critical Materials List: Present

Minnesota - Hazardous Substance List: Present

New York Release Reporting - List of Hazardous Substances:

1 lb RQ
10 lb RQ

Connecticut - Carcinogenic Substances: Present

Louisiana Reportable Quantity List for Pollutants: 1lbfinal RQno reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is $\geq 100 \mu\text{m}$

0.454kgfinal RQno reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is $\geq 100 \mu\text{m}$

California Directors List of Hazardous Substances: Present

Beryllium

Massachusetts RTK: Present

Massachusetts EHS: carcinogen; extraordinarily hazardous

New Jersey RTK Hazardous Substance List: Present

New Jersey (EHS) List: Present

New Jersey - Discharge Prevention - List of Hazardous Substances: Present

Pennsylvania RTK: Environmental hazard

Special hazardous substance

Pennsylvania RTK - Environmental Hazard List Present

Pennsylvania RTK - Special Hazardous Substances Present

RI RTK - Hazardous Substances List: Present

Michigan - Critical Materials List: Present

Minnesota - Hazardous Substance List: Present

New York Release Reporting - List of Hazardous Substances:

10 lb RQ

Louisiana Reportable Quantity List for Pollutants: 10lbfinal RQno reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is $\geq 100 \mu\text{m}$

4.54kgfinal RQno reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is $\geq 100 \mu\text{m}$

California Directors List of Hazardous Substances: Present

Cadmium

Massachusetts RTK: Present

New Jersey RTK Hazardous Substance List: Present

New Jersey (EHS) List: Present

New Jersey - Discharge Prevention - List of Hazardous Substances: Present

Pennsylvania RTK: Environmental hazard

Special hazardous substance

Pennsylvania RTK - Environmental Hazard List Present

Pennsylvania RTK - Special Hazardous Substances Present

RI RTK - Hazardous Substances List: Present

Michigan - Critical Materials List: Present

Minnesota - Hazardous Substance List: Present

New York Release Reporting - List of Hazardous Substances:

1 lb RQ
10 lb RQ

Louisiana Reportable Quantity List for Pollutants: 10lbfinal RQno reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is $\geq 100 \mu\text{m}$

4.54kgfinal RQno reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is $\geq 100 \mu\text{m}$

California Directors List of Hazardous Substances: Present

Nitric acid

Cobalt

Massachusetts RTK: Present
New Jersey RTK Hazardous Substance List: Present
New Jersey (EHS) List: Present
New Jersey - Discharge Prevention - List of Hazardous Substances: Present
Pennsylvania RTK: Environmental hazard
Pennsylvania RTK - Environmental Hazard List Present
Minnesota - Hazardous Substance List: Present
California Directors List of Hazardous Substances: Present

Copper Metal

Massachusetts RTK: Present
New Jersey RTK Hazardous Substance List: Present
New Jersey (EHS) List: Present
New Jersey - Discharge Prevention - List of Hazardous Substances: Present
Pennsylvania RTK: Environmental hazard
Pennsylvania RTK - Environmental Hazard List Present
RI RTK - Hazardous Substances List: Present
Michigan - Critical Materials List: Present
Minnesota - Hazardous Substance List: Present
New York Release Reporting - List of Hazardous Substances:
5000 lb RQ
100 lb RQ
Louisiana Reportable Quantity List for Pollutants: 5000lbfinal RQAs listed in 40 CFR 302.4 Table 302.4. No reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is $\geq 100 \mu\text{m}$
2270kgfinal RQAs listed in 40 CFR 302.4 Table 302.4. No reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is $\geq 100 \mu\text{m}$
100lbRQAs listed in Louisiana Administrative Code, Title 33, Part 1, Subpart 2, Chapter 39, Subchapter E. Applies to unauthorized emissions based on total mass emitted into the atmosphere. No reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is $\geq 100 \mu\text{m}$
5000lbRQAs listed in Louisiana Administrative Code, Title 33, Part 1, Subpart 2, Chapter 39, Subchapter E. Applies to unauthorized emissions based on total mass emitted into or onto all media within any consecutive 24-hour period. No reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is $\geq 100 \mu\text{m}$
California Directors List of Hazardous Substances: Present

Vanadium

Massachusetts RTK: Present
New Jersey RTK Hazardous Substance List: Present
New Jersey (EHS) List: Present
New Jersey - Discharge Prevention - List of Hazardous Substances: Present
Pennsylvania RTK: Environmental hazard
Pennsylvania RTK - Environmental Hazard List Present
Pennsylvania RTK - Special Hazardous Substances Present
California Directors List of Hazardous Substances: Present

Zinc

Massachusetts RTK: Present
New Jersey RTK Hazardous Substance List: Present
New Jersey (EHS) List: Present
New Jersey - Discharge Prevention - List of Hazardous Substances: Present
Pennsylvania RTK: Environmental hazard
Pennsylvania RTK - Environmental Hazard List Present
RI RTK - Hazardous Substances List: Present
Michigan - Critical Materials List: Present
New York Release Reporting - List of Hazardous Substances:
1000 lb RQ
100 lb RQ
Louisiana Reportable Quantity List for Pollutants: 454kgfinal RQno reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is $\geq 100 \mu\text{m}$
1000lbfinal RQno reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is $\geq 100 \mu\text{m}$
California Directors List of Hazardous Substances: Present

California Prop. 65: Safe Drinking Water and Toxic Enforcement Act of 1986.

Chemicals Known to the State of California to Cause Cancer:

WARNING: This product contains a chemical known to the State of California to cause cancer. (See table below)

Chemicals Known to the State of California to Cause Reproductive Toxicity:

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm (See table below)

| Components | Carcinogen | Developmental Toxicity | Male Reproductive Toxicity | Female Reproductive Toxicity: |
|------------------------------|------------|------------------------|----------------------------|-------------------------------|
| Water | Not Listed | Not Listed | Not Listed | Not Listed |
| Nitric acid | Not Listed | Not Listed | Not Listed | Not Listed |
| Selenium | Not Listed | Not Listed | Not Listed | Not Listed |
| Chromium Nitrate nonahydrate | Not Listed | Not Listed | Not Listed | Not Listed |
| Antimony Trioxide | carcinogen | Not Listed | Not Listed | Not Listed |
| Ammonium Molybdate | Not Listed | Not Listed | Not Listed | Not Listed |
| Ammonium Hexafluorotitanate | Not Listed | Not Listed | Not Listed | Not Listed |
| Calcium Carbonate | Not Listed | Not Listed | Not Listed | Not Listed |
| Iron Metal | Not Listed | Not Listed | Not Listed | Not Listed |
| Lead | carcinogen | developmental toxicity | male reproductive toxicity | female reproductive toxicity |
| Magnesium | Not Listed | Not Listed | Not Listed | Not Listed |
| Manganese Metal, powder | Not Listed | Not Listed | Not Listed | Not Listed |
| Nickel | carcinogen | Not Listed | Not Listed | Not Listed |
| Thallium | Not Listed | Not Listed | Not Listed | Not Listed |
| Arsenic | Not Listed | Not Listed | Not Listed | Not Listed |
| Beryllium | carcinogen | Not Listed | Not Listed | Not Listed |
| Cadmium | carcinogen | developmental toxicity | male reproductive toxicity | Not Listed |
| Cobalt | carcinogen | Not Listed | Not Listed | Not Listed |
| Copper Metal | Not Listed | Not Listed | Not Listed | Not Listed |
| Vanadium | Not Listed | Not Listed | Not Listed | Not Listed |
| Zinc | Not Listed | Not Listed | Not Listed | Not Listed |

CERCLA/SARA

| Components | CERCLA - Hazardous Substances and their Reportable Quantities | Section 302 Extremely Hazardous Substances and TPQs | Section 302 Extremely Hazardous Substances and RQs | Section 313 - Chemical Category | Section 313 - Reporting de minimis |
|------------------------------|---|---|--|---------------------------------|---|
| Water | None | None | None | None | None |
| Nitric acid | 1000 lb final RQ 454 kg final RQ | 1000 lb TPQ | None | None | 1.0 % de minimis concentration |
| Selenium | 100 lb final RQ 45.4 kg final RQ | None | None | None | 1.0 % de minimis concentration |
| Chromium Nitrate nonahydrate | None | None | None | None | None |
| Antimony Trioxide | 1000 lb final RQ 454 kg final RQ | None | None | None | None |
| Ammonium Molybdate | None | None | None | None | None |
| Ammonium Hexafluorotitanate | None | None | None | None | None |
| Calcium Carbonate | None | None | None | None | None |
| Iron Metal | None | None | None | None | None |
| Lead | 10 lb final RQ 4.54 kg final RQ | None | None | None | 0.1 % Supplier notification limit 0.1 % de minimis concentration |
| Magnesium | None | None | None | None | None |
| Manganese Metal, powder | None | None | None | None | 1.0 % de minimis concentration |
| Nickel | 100 lb final RQ 45.4 kg final RQ | None | None | None | 0.1 % de minimis concentration |
| Thallium | = 1000 lb final RQ = 454 kg final RQ | None | None | None | = 1.0 % de minimis concentration |
| Arsenic | 1 lb final RQ 0.454 kg final RQ | None | None | None | 0.1 % de minimis concentration |
| Beryllium | 10 lb final RQ 4.54 kg final RQ | None | None | None | 0.1 % de minimis concentration |
| Cadmium | 10 lb final RQ 4.54 kg final RQ | None | None | None | 0.1 % de minimis concentration |
| Cobalt | None | None | None | None | 0.1 % de minimis concentration |
| Copper Metal | 5000 lb final RQ 2270 kg final RQ | None | None | None | 1.0 % de minimis concentration |
| Vanadium | None | None | None | None | = 1.0 % de minimis concentration |
| Zinc | 454 kg final RQ 1000 lb final RQ | None | None | None | 1.0 % de minimis concentration |

U.S. TSCA

| Components | TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS) | TSCA 8(d) -Health and Safety Reporting |
|------------------------------|---|--|
| Water | Not Applicable | Not Applicable |
| Nitric acid | Not Applicable | Not Applicable |
| Selenium | Not Applicable | Not Applicable |
| Chromium Nitrate nonahydrate | Not Applicable | Not Applicable |
| Antimony Trioxide | Not Applicable | 10/04/1982 10/04/1992 |
| Ammonium Molybdate | Not Applicable | Not Applicable |
| Ammonium Hexafluorotitanate | Not Applicable | Not Applicable |
| Calcium Carbonate | Not Applicable | Not Applicable |
| Iron Metal | Not Applicable | Not Applicable |
| Lead | Not Applicable | Effective 2/28/08, Sunset 4/28/08 reporting requirements apply only to manufacturers and importers of consumer products intended for use by children who also manufacture or import Lead or Lead compounds |
| Magnesium | Not Applicable | Not Applicable |
| Manganese Metal, powder | Not Applicable | Not Applicable |
| Nickel | Not Applicable | Not Applicable |
| Thallium | Not Applicable | 06/01/1987 06/01/1997 |
| Arsenic | Not Applicable | Not Applicable |
| Beryllium | Not Applicable | Not Applicable |
| Cadmium | Not Applicable | Not Applicable |
| Cobalt | Not Applicable | 06/01/1987 06/01/1997 |
| Copper Metal | Not Applicable | Not Applicable |
| Vanadium | Not Applicable | Not Applicable |
| Zinc | Not Applicable | Not Applicable |

Canada

WHMIS hazard class:

E Corrosive material

Water

Uncontrolled product according to WHMIS classification criteria

Nitric acid

C E including 61.3%, 67.18%, 70%
E 0.63%, 6.3%

Selenium

Uncontrolled product according to WHMIS classification criteria including amorphous and crystalline

Chromium Nitrate nonahydrate

C

Antimony Trioxide

D2A

Calcium Carbonate

Uncontrolled product according to WHMIS classification criteria

Iron Metal

Uncontrolled product according to WHMIS classification criteria

Lead

D2A

Magnesium

B4 B6

Manganese Metal, powder

D2A including powder

Nickel

D2A D2B
B6 D2A Raney

Arsenic

D1A D2A

Beryllium

Water

D2A D2B
B4 D1A D2A D2B powder

Cadmium

D1A D2A

Cobalt

D2A D2B

Copper Metal

Uncontrolled product according to WHMIS classification criteria

Canada Controlled Products Regulation:

This product has been classified according to the hazard criteria of the CPR (Controlled Products Regulation) and the MSDS contains all of the information required by the CPR.

| Components | WHMIS Ingredient Disclosure List - |
|-------------------------|------------------------------------|
| Nitric acid | 1 % |
| Selenium | 0.1 % |
| Antimony Trioxide | 1 % |
| Lead | 0.1 % |
| Manganese Metal, powder | 1 % |
| Nickel | 0.1 % |
| Thallium | 1 % |
| Arsenic | 0.1 % |
| Beryllium | 0.1 % |
| Cadmium | 0.1 % |
| Cobalt | 0.1 % |
| Copper Metal | 1 % |
| Vanadium | 1 % |

Inventory

| Components | Canada (DSL) | Canada (NDSL) |
|------------------------------|--------------|---------------|
| Water | Present | Not Listed |
| Nitric acid | Present | Not Listed |
| Selenium | Present | Not Listed |
| Chromium Nitrate nonahydrate | Not Listed | Not Listed |
| Antimony Trioxide | Present | Not Listed |
| Ammonium Molybdate | Not Listed | Not Listed |
| Ammonium Hexafluorotitanate | Not Listed | Not Listed |
| Calcium Carbonate | Present | Not Listed |
| Iron Metal | Present | Not Listed |
| Lead | Present | Not Listed |
| Magnesium | Present | Not Listed |
| Manganese Metal, powder | Present | Not Listed |
| Nickel | Present | Not Listed |
| Thallium | Present | Not Listed |
| Arsenic | Present | Not Listed |
| Beryllium | Present | Not Listed |
| Cadmium | Present | Not Listed |
| Cobalt | Present | Not Listed |
| Copper Metal | Present | Not Listed |
| Vanadium | Present | Not Listed |
| Zinc | Present | Not Listed |

| Components | CEPA Schedule I - Toxic Substances | CEPA - 2010 Greenhouse Gases Subject to Mandatory Reporting |
|------------------------------|------------------------------------|---|
| Water | Not listed | Not listed |
| Nitric acid | Not listed | Not listed |
| Selenium | Not listed | Not listed |
| Chromium Nitrate nonahydrate | Not listed | Not listed |
| Antimony Trioxide | Not listed | Not listed |
| Ammonium Molybdate | Not listed | Not listed |
| Ammonium Hexafluorotitanate | Not listed | Not listed |

| | | |
|-------------------------|------------|------------|
| Calcium Carbonate | Not listed | Not listed |
| Iron Metal | Not listed | Not listed |
| Lead | Present | Not listed |
| Magnesium | Not listed | Not listed |
| Manganese Metal, powder | Not listed | Not listed |
| Nickel | Not listed | Not listed |
| Thallium | Not listed | Not listed |
| Arsenic | Not listed | Not listed |
| Beryllium | Not listed | Not listed |
| Cadmium | Not listed | Not listed |
| Cobalt | Not listed | Not listed |
| Copper Metal | Not listed | Not listed |
| Vanadium | Not listed | Not listed |
| Zinc | Not listed | Not listed |

EU Classification

R-phrase(s)

R34 - Causes burns.

S -phrase(s)

S23 - Do not breathe gas/fumes/vapor/spray.

S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S36 - Wear suitable protective clothing.

S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 1/2 - Keep locked up and out of the reach of children.

| Components | Classification | Concentration Limits: | Safety Phrases |
|------------------------------|--|--|------------------------|
| Water | | No information | |
| Nitric acid | C;R35 O;R8 | 20%≤C C;R35 5%≤C<20% C;R34 70%≤C O;R8 | S(1/2)-S23-S26-S36-S45 |
| Selenium | R33 R53 T;R23/25 | No information | S(1/2)-S20/21-S28-S45 |
| Chromium Nitrate nonahydrate | | No information | |
| Antimony Trioxide | Carc.Cat.3; R40 | No information | S2 S22 S36/37 |
| Ammonium Molybdate | | No information | |
| Ammonium Hexafluorotitanate | | No information | |
| Calcium Carbonate | | No information | |
| Iron Metal | | No information | |
| Lead | N;R50-53 NE R33 Repr. Cat.1;R61 Repr. Cat.3;R62 Xn;R20/22 | 0.5%≤C<1% T;R61-33 1%≤C<5% T;R61-20/22-33 5%≤C T;R61-20/22-33-62 | S53-S45-S60-S61 |
| Magnesium | F;R15-17 | No information | S(2)-S7/8-S43 |
| Manganese Metal, powder | | No information | |
| Nickel | Carc. Cat.3;R40 R43 | No information | S2 S36/37/39 S45 |

| | | | |
|--------------|--|----------------|--------------------------------|
| Thallium | R33 R53 T+;R26/28 | No information | S1/2 S13 S28 S45 S61 |
| Arsenic | T; R23/25 N; R50-53 | No information | S1/2 S20/21 S28 S45 S60 S61 |
| Beryllium | Carc. Cat.2;R49 R43 T+;R26 T;R25-48/23 Xi;R36/37/38 | No information | S53-S45 |
| Cadmium | T+; R26 Carc.Cat.2; R45 T; R48/23/25 N; R50-53 Repr.Cat.3; R62-63 Muta.Cat.3; R68 | No information | S53 S45 S60 S61 |
| Cobalt | R42/43 R53 | No information | S(2)-S22-S24-S37 |
| Copper Metal | | No information | |
| Vanadium | | No information | |
| Zinc | F;R15-17 | No information | |

The product is classified in accordance with Annex VI to Directive 67/548/EEC

Indication of danger:

C - Corrosive.



16. OTHER INFORMATION

16. OTHER INFORMATION

| | | |
|-------------|-------------|--------------------------------------|
| NFPA | HMIS | Personal Protective Equipment |
|-------------|-------------|--------------------------------------|



| | |
|---------------|---|
| Health Hazard | 3 |
| Fire Hazard | 0 |
| Reactivity | 0 |



Preparation Date: 1/29/2015
Revision Date: 1/29/2015
Prepared by: Sonia Owen

Disclaimer:

All chemicals may pose unknown hazards and should be used with caution. This Safety Data Sheet (SDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. The physical properties reported in this SDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.

End of Safety Data Sheet