

**SODIUM ANTIMONATE
SAFETY DATA SHEET**

SECTION 1. IDENTIFICATION

Product Identity: Sodium Antimonate.

Trade Names and Synonyms: Sodium Pyroantimonate, Sodium Hexahydroantimonate, Sodium Hexahydroxoantimonate.

Manufacturer:

Teck Metals Ltd.
Trail Operations
Trail, British Columbia
V1R 4L8
Emergency Telephone: 250-364-4214

Supplier:

Teck Metals Ltd.
Trail Operations
Trail, British Columbia
V1R 4L8

Preparer:

Teck Metals Ltd.
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Vancouver, British Columbia
V6C 0B3

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Product Use: Raw material for the preparation of antimony compounds used in fire retardants, glass and ceramic production.

SECTION 2. HAZARDS IDENTIFICATION

CLASSIFICATION:

| Health | Physical | Environmental |
|--|--|--------------------------------------|
| Acute Toxicity – does not meet criteria Skin Irritation – does not meet criteria Eye Irritation – does not meet criteria Sensitization – does not meet criteria Mutagenicity – does not meet criteria Carcinogenicity – Category 1 Reproductive – Category 1A Specific Target Organ Toxicity – does not meet criteria | Does not meet criteria for any Physical Hazard | Aquatic Toxicity – Category 4 |

LABEL:

| | | |
|-----------------|---|---|
| Symbols: |  | Signal Word: DANGER |
| DANGER! | Hazard Statements May cause cancer. May damage fertility or the unborn child. May cause long lasting harmful effects to aquatic life. | Precautionary Statements: Use personal protective equipment as required. If exposed or concerned: Get medical attention. Dispose of contents/container in accordance with local regulations. Avoid release to the environment. |

Emergency Overview: A white powder that does not burn or readily decompose in a fire situation. Dust particles may cause mild eye, skin and respiratory irritation. Contact with acid solutions under reducing conditions (e.g., in the presence of zinc or galvanized steel) may generate toxic stibine (antimony hydride) gas. Such circumstances should be regarded as being immediately life threatening. SCBA and full protective clothing are required for fire emergency response personnel.

Potential Health Effects: Caution: The toxicological properties of this material have not been fully investigated. The information contained in this SDS is therefore based on information in the technical and scientific literature about the material's constituent compounds. Sodium antimonate may be mildly irritating to the eyes, skin and respiratory passages. Inhalation may result in dryness and irritation of the nose and throat, cough, headache and nausea. Prolonged exposure may cause irritation of the eyes, nose and respiratory system, dermatitis, anemia, and possible effects on internal organ systems, principally the kidneys. Inorganic antimony compounds are not considered human carcinogens by IARC, the ACGIH, OSHA, NTP or the EU. However, due to the presence of

arsenic and lead compounds this product is considered to present a risk of carcinogenesis and reproductive or developmental toxicity (see Toxicological Information, Section 11).

Potential Environmental Effects: The product has very low water solubility and therefore its constituent metal compounds are not readily bioavailable. Nevertheless, the product should be considered hazardous in aquatic and terrestrial environments based on the antimony, lead and arsenic compound constituents (See Ecological Information, Section 12).

SECTION 3. COMPOSITION / INFORMATION ON INGREDIENTS

| HAZARDOUS COMPONENTS | CAS Registry No. | CONCENTRATION (% wgt/wgt) |
|--|------------------|---------------------------|
| Sodium Antimony Hydroxide {NaSb(OH) ₆ } | 33908-66-6 | 97% |
| Lead Compound | 7439-92-1 | 0.4% (as lead) |
| Arsenic Compound | 7440-38-2 | 0.2% (as arsenic) |

Note: See Section 8 for Occupational Exposure Limits.

SECTION 4. FIRST AID MEASURES

Eye Contact: Eye irritation. If irritation occurs, cautiously rinse eyes with lukewarm, gently flowing water for 5 minutes, while holding the eyelids open. If eye irritation persists, get medical advice.

Skin Contact: Skin irritation, redness. Rinse/wash with lukewarm, gently flowing water and mild soap for 5 minutes or until product is removed. If skin irritation occurs or you feel unwell get medical advice.

Inhalation: Respiratory irritation, coughing, sneezing. Remove source of exposure or move person to fresh air and keep comfortable for breathing. Obtain medical advice if you feel unwell.

Ingestion: Rinse mouth. If you feel unwell or are concerned, get medical advice.

SECTION 5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: This product is not flammable or combustible and is not considered a fire or explosion hazard.

Extinguishing Media: Use any means of extinction appropriate for surrounding fire conditions such as water spray, carbon dioxide, dry chemical, or foam.

Fire Fighting: Fire fighters must be fully trained and wear full protective clothing including an approved, self-contained breathing apparatus which supplies a positive air pressure within a full face-piece mask. Do not allow water run-off to enter sewers or water courses.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Procedures for Cleanup: Control source of spillage if possible to do so safely. Restrict access to the area until completion of clean up. Clean up spilled material immediately, observing precautions in Section 8, Personal Protection and using methods which will minimize dust generation (e.g., vacuum solids, dampen material and shovel or wet sweep). Return uncontaminated spilled material to the process if possible. Place contaminated material in suitable labeled containers for later recovery or disposal. Treat or dispose of waste material in accordance with all local, regional, and national requirements.

Personal Precautions: Persons responding to an accidental release should wear protective clothing, gloves and a respirator (see also Section 8). Close-fitting safety goggles may be necessary in some circumstances to prevent eye contact with dust. Workers should wash and change clothing following cleanup of a spill to prevent personal contamination with dust.

Environmental Precautions: This product can pose risks to aquatic and terrestrial biota in the environment. Contamination of soil and water should, therefore, be avoided. Prevent spills or water run-off from storage areas from entering soil, sewers or any other water courses.

SECTION 7. HANDLING AND STORAGE

Store containers in a dry, cool, well-ventilated area, separate from strong acids, other incompatible materials, active metals such as zinc and aluminum dusts, and foods or feedstuffs. Keep container tightly closed. Minimize dust generation and accumulation. Avoid breathing dust. Always practice good personal hygiene. Refrain from eating, drinking, or smoking in work areas. Thoroughly wash hands before eating, drinking, or smoking in appropriate, designated areas as well as at the end of the workday.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational Exposure Guidelines:

| <u>Component</u> | <u>ACGIH TLV</u> | <u>OSHA PEL</u> | <u>NIOSH REL</u> |
|---------------------------|---------------------------|---------------------------|--------------------------------------|
| Sodium Antimony Hydroxide | 0.5 mg Sb/m ³ | 0.5 mg Sb/m ³ | 0.5 mg Sb/m ³ |
| Lead | 0.05 mg Pb/m ³ | 0.05 mg Pb/m ³ | 0.05 mg Pb/m ³ |
| Arsenic | 0.01 mg As/m ³ | 0.01 mg As/m ³ | 0.002 mg As/m ³ (Ceiling) |

NOTE: OEGs for individual jurisdictions may differ from those given above. Check with local authorities for the applicable OEGs in your jurisdiction. ACGIH - American Conference of Governmental Industrial Hygienists; OSHA - Occupational Safety and Health Administration; NIOSH - National Institute for Occupational Safety and Health. TLV – Threshold Limit Value, PEL – Permissible Exposure Limit, REL – Recommended Exposure Limit.

NOTE: The selection of the necessary level of engineering controls and personal protective equipment will vary depending upon the conditions of use and the potential for exposure. The following are therefore only general guidelines that may not fit all circumstances. Control measures to consider include:

Ventilation: Use adequate local or general ventilation to maintain the concentration of sodium antimonate in the working environment well below recommended occupational exposure limits, especially where dust is generated. Supply sufficient replacement air to make up for air removed by the exhaust system. Use process enclosure, local exhaust ventilation, moist rather than dry handling techniques or other engineering controls to minimize airborne dust generation.

Protective Clothing: Coveralls or other work clothing, glasses or goggles, and gloves are recommended to prevent prolonged or repeated direct skin contact. Close-fitting safety goggles may be required to prevent eye contact if excessive dust is generated. Workers should wash immediately when skin becomes heavily contaminated as well as at the end of each work shift. Work clothing should be removed immediately if it becomes heavily contaminated and should be changed daily if there is reasonable probability that the clothing may be contaminated. Launder contaminated clothes before reuse.

Respirators: Where sodium antimonate dust is generated and cannot be controlled to within acceptable levels by engineering means, use appropriate NIOSH-approved respiratory protection equipment (a 42CFR84 Class N, R or P-100 particulate filter cartridge).

General Hygiene Considerations: Always practice good personal hygiene. Refrain from eating, drinking, or smoking in work areas. Thoroughly wash hands before eating, drinking, or smoking in appropriate, designated areas, and also at the end of the workday.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

| | | | |
|--|--|--|--|
| Appearance: White Powder | Odour: None | Odour Threshold: Not Applicable | pH: Not Applicable |
| Vapour Pressure: Negligible @ 25°C | Vapour Density: Not Applicable | Boiling Point/Range: Product has no boiling point | Melting Point/Range: Not measurable (>600°C) |
| Relative Density (Water = 1): 3.5 | Evaporation Rate: Not Applicable | Coefficient of Water/Oil Distribution: Not Applicable | Solubility: Slight |
| Flash Point: Not Applicable | Flammable Limits (LEL/UEL): Not Applicable | Auto-ignition Temperature: Not Applicable | |

SECTION 10. STABILITY AND REACTIVITY

Stability & Reactivity: Sodium antimonate is stable and not considered reactive under normal temperatures and pressures. Hazardous polymerization or runaway reactions will not occur.

Incompatibilities: Acids, alkalis, reducing agents. Freshly formed hydrogen and reducing conditions may result in the generation of stibine and arsine gas.

Hazardous Decomposition Products: Under reducing conditions (i.e., any strong acid or base plus an active metal such as zinc aluminum or galvanized steel) or in the presence of freshly formed hydrogen, highly toxic STIBINE gas (antimony hydride) as well as possible traces of ARSINE (arsenic hydride) may be evolved. High temperature operations such as oxy-acetylene cutting or

electric arc welding on dust-contaminated surfaces will generate toxic and irritating fumes of antimony oxides, plus traces of arsenic and lead oxides.

SECTION 11. TOXICOLOGICAL INFORMATION

General: *NOTE:* There is very limited available data on the health effects of sodium antimony hydroxide. Therefore, much of the information provided in this MSDS is based on analogy with other pentavalent antimony compounds for which more extensive health hazard data and industrial experience are available. The primary route of exposure to sodium antimonate is through inhalation of dust. Ingestion is a possible secondary route of exposure.

Acute:

Skin/Eye: Direct contact may cause local irritation to the skin and eyes, including redness and pain. Symptoms are more severe from prolonged over-exposure.

Inhalation: Sodium antimonate dust may be irritating to the respiratory tract, possibly causing coughing, sneezing, dryness of the nose and throat, sore throat, headache or nausea. **Highly toxic stibine (and arsine) gas may be generated under certain conditions when antimony (and arsenic) containing compounds are in contact with strongly acidic or alkaline solutions and active metals such as zinc, aluminum or galvanized steel. Exposure to stibine (and arsine) gas should be regarded as life-threatening.**

Ingestion: Ingestion of antimony compounds can cause dizziness, nausea, vomiting, sore throat, abdominal pain, diarrhea and a burning sensation in the stomach.

Chronic:

Prolonged dust exposure may produce many of the same symptoms identified above for acute exposure as well as dermatitis, anemia, weight loss, and possible kidney dysfunction. This product also contains low levels of lead and arsenic. Lead, in particular, accumulates in bone and body organs once it enters the body. Elimination from the body is slow. Absorbed lead and arsenic affect a variety of organ systems including the nervous system, kidneys, reproductive system, blood forming system, and gastrointestinal system. Women of child-bearing capacity and particularly pregnant women should be protected from excessive exposure as lead can cross the placental barrier to the unborn child causing neurological and developmental problems. Arsenic compounds have caused skin and mucous membrane irritation and, occasionally, ulceration and perforation of the nasal septum. Inorganic antimony compounds are not considered human carcinogens by the Occupational Safety and Health Administration (OSHA), the National Toxicology Program (NTP), the American Conference of Governmental Industrial Hygienists (ACGIH), the International Agency for Research on Cancer (IARC), or the European Union (EU). Arsenic and inorganic arsenic compounds are listed as an A1 Carcinogen (Confirmed Human Carcinogen) by the ACGIH and as a Group 1 Carcinogen (Carcinogenic to Humans) by IARC. The NTP, OSHA and the EU also identify arsenic and inorganic arsenic compounds as Known Human Carcinogens. Lead and lead compounds are listed as an A3 Carcinogen (Confirmed Animal Carcinogen with Unknown Relevance to Humans) by the ACGIH. IARC has listed lead compounds as Group 2A Carcinogens (Probably Carcinogenic to Humans). The NTP has listed lead and lead compounds as Reasonably Anticipated to be a Human Carcinogen. OSHA and the EU do not currently list lead as a human carcinogen.

Animal Toxicity:

| | | | |
|----------------------------------|--|-----------------|-----------------------------------|
| Acute Oral Toxicity | Antimony ...>2,000 mg/kg [†] | Lead ...no data | Arsenic ...763 mg/kg [†] |
| Acute Dermal Toxicity | Antimony ...no data | Lead ...no data | Arsenic ...no data |
| Acute Inhalation Toxicity | Antimony ...>5.4 mg/L/4hr [‡] | Lead ...no data | Arsenic ...no data |

[†] LD₅₀, Rat, Oral [‡] LC₅₀, Rat, Inhalation, 4 hour

SECTION 12. ECOLOGICAL INFORMATION

This product has low water solubility and therefore its constituent metal compounds are not readily bioavailable. However, its processing or extended exposure in the environment may lead to the release of antimony, lead and arsenic in bioavailable forms.

Antimony and arsenic compounds are not highly toxic in aquatic and terrestrial environments but lead can be so at relatively low concentrations. Lead can be strongly bioaccumulated by both aquatic and terrestrial plants and animals, while antimony and arsenic bioaccumulate to a much lesser extent. In water, lead toxicity can be regulated by factors such as pH, hardness and dissolved organic carbon content, while the toxicities of antimony and arsenic depend primarily on their oxidation states. Antimony, arsenic and lead compounds will usually be sorbed onto soil particles to a degree dependent on various soil properties.

SECTION 13. DISPOSAL CONSIDERATIONS

Do not wash down drains or allow to reach natural watercourses. If material cannot be returned to process or salvage, dispose of only in accordance with applicable regulations.

SECTION 14. TRANSPORT INFORMATION

PROPER SHIPPING NAME TRANSPORT CANADA Not a regulated product
PROPER SHIPPING U.S. DOT Environmentally Hazardous Substance, Solid, n.o.s.
(contains arsenic)
TRANSPORT CANADA CLASSIFICATION Not applicable
U.S. DOT CLASSIFICATION Class 9, UN3077, Packing Group III
MARINE POLLUTANT No
IMO CLASSIFICATION Not regulated

SECTION 15. REGULATORY INFORMATION

U.S.

INGREDIENTS LISTED ON TSCA INVENTORY Yes

HAZARDOUS UNDER HAZARD COMMUNICATION STANDARD Sodium Antimony Hydroxide Yes
Lead Compounds Yes
Arsenic Compounds Yes

CERCLA SECTION 103 HAZARDOUS SUBSTANCES Antimony Yes RQ: 5,000 lbs.
Arsenic Yes RQ: 1 lb.
Lead Yes RQ: 10 lbs.

EPCRA SECTION 302 EXTREMELY HAZARDOUS SUBSTANCE None of the ingredients qualify.

EPCRA SECTION 311/312 HAZARD CATEGORIES Immediate (Acute) Health Hazard – Irritant
Delayed (Chronic) Health Hazard – Carcinogen
Delayed (Chronic) Health Hazard – Reproductive Toxin

EPCRA SECTION 313 TOXIC RELEASE INVENTORY: Antimony Compounds (Sodium Antimony Hydroxide)
CAS No. 33908-66-6
Percent by Weight: 97%

Arsenic Compounds
CAS No. (Arsenic) 7440-38-2
Percent by Weight: 0.2%

Lead Compounds
CAS No. (Lead) 7439-92-1
Percent by Weight: 0.4%

SECTION 16. OTHER INFORMATION

Date of Original Issue: January 9, 1998 **Version:** 01
Date of Latest Revision: May 1, 2015 **Version:** 16

The information in this Safety Data Sheet is based on the following references:

- American Conference of Governmental Industrial Hygienists, 2004, Documentation of the Threshold Limit Values and Biological Exposure Indices, 7th Edition (plus updates).
- American Conference of Governmental Industrial Hygienists, 2014, Guide to Occupational Exposure Values.
- American Conference of Governmental Industrial Hygienists, 2014, Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices.
- Bretherick's Handbook of Reactive Chemical Hazards, 20th Anniversary Edition. (P. G. Urban, Ed.) 1995.
- European Chemical Agency (ECHA) – Registered Substances database (*last accessed 11 Dec 2014*).
- Handbook on the Toxicology of Metals, 3rd Ed., Gunnar F. Nordberg, Bruce A. Fowler, Monica Nordberg and Lars Friberg, Editors, Academic Press, New York, NY (2007).
- Health Canada, Proposed Hazardous Products Regulations (*issued for comment 9 August 2014*).
- International Agency for Research on Cancer (IARC), Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, 1972 – present, (multi-volume work), World Health Organization, Geneva.
- Merck & Co., Inc., 2001, The Merck Index, An Encyclopedia of Chemicals, Drugs, and Biologicals, Thirteenth Edition.
- National Library of Medicine, National Toxicology Information Program, Hazardous Substance Data Bank. On-line edition.
- The International Antimony Association website at <http://www.antimony.com/antimony-compounds/antimony-compounds.htm>.
- Toxicological Risks of Selected Flame-Retardant Chemicals (Chapter 11) – The National Research Council, 2000.

- U.S. Department of Health and Human Services, National Institute of Environmental Health Sciences, National Toxicology Program (NTP), 12th Report on Carcinogens, June 2011.
- U.S. Department of Health and Human Services, National Institute for Occupational Safety and Health, NIOSH Pocket Guide to Chemical Hazards. CD-ROM Edition September 2005.
- U.S. Department of Health and Human Services, National Institute for Occupational Safety and Health, Registry of Toxic Effects of Chemical Substances (RTECS) CCOHS web version, *last accessed 10-Sept-2013*.
- U.S. Occupational Safety and Health Administration, 1989, Code of Federal Regulations, Title 29, Part 1910.

Notice to Reader

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