

MERCUROUS CHLORIDE MATERIAL SAFETY DATA SHEET

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product Identity: Mercurous Chloride

Manufacturer:

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

Supplier:

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

MSDS Preparer:

Teck Metals Ltd.
Suite 3300 – 550 Burrard Street
Vancouver, British Columbia
CANADA
V6C 0B3

Date of Last MSDS Revision/Edit: October 26, 2009.

Product Use: Mercurous chloride is used as a feed for the production of high purity mercury metal and for producing mercury-containing chemicals.

SECTION 2. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous Ingredient	Approximate Percent by Weight	CAS Number	Occupational Exposure Limits (OELs)	LD ₅₀ / LC ₅₀ Species and Route
Mercurous Chloride	90-95%	10112-91-1	OSHA PEL 0.1 mg Hg/m ³ (ceiling) ACGIH TLV 0.025 mg Hg/m ³ (skin) NIOSH REL 0.1 mg Hg/m ³ (skin)(C)	LD ₅₀ , rat, oral 210 mg/kg LD ₅₀ , rat, skin 1500 mg/kg LD ₅₀ , mouse, oral 180 mg/kg

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

Trade Names and Synonyms: Calomel, Hg₂Cl₂, Dimercury dichloride.

SECTION 3. HAZARDS IDENTIFICATION

Emergency Overview: A heavy, white to grey crystalline solid that is not flammable or combustible. However, when heated strongly in air or exposed to intense sunlight it will liberate mercury vapour. Inhalation or ingestion of dust or toxic fumes may produce both acute and chronic health effects. May also be hazardous to the environment. SCBA and full protective clothing required for fire emergency response personnel.

Potential Health Effects: Inhalation or ingestion may result in mercury absorption and toxicity. Symptoms include irritation of the eyes, skin and respiratory system, headache, nausea, vomiting, abdominal pain, tightness of the chest and difficulty breathing. Prolonged exposure may also cause central nervous system damage (e.g., tremors, irritability, personality and behavioral changes), gastrointestinal disturbances, kidney dysfunction and possible renal failure. May also be absorbed through the skin in limited quantities. Mercurous chloride is not listed as a carcinogen by OSHA, the NTP, the ACGIH, IARC, or the EU (see Toxicological Information, Section 11).

Potential Environmental Effects: Although this compound has relatively low water solubility, chemical and biological transformations of the compound can increase its bioavailability. Specifically, when the product is spilled and thereby released into the environment, it can be subject to biomethylation (the transformation of inorganic to methyl mercury, primarily carried out by sulfate-reducing bacteria that live in low oxygen environments), which in turn leads to pronounced bioaccumulation in both aquatic and terrestrial food chains. (see Ecological Information, Section 12)

EU Risk Phrase(s): R22 - Harmful if swallowed; R36/37/38 - Irritating to eyes, respiratory system and skin; R50/53 – Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

SECTION 4. FIRST AID MEASURES

Eye Contact: Quickly and gently blot or brush chemical off face. Immediately flush the contaminated eye(s) with lukewarm, gently flowing water, for 15 – 20 minutes, while holding the eyelid(s) open. If a contact lens is present, DO NOT delay irrigation or attempt to remove the lens. Take care not to rinse contaminated water into the unaffected eye or onto the face. Immediately obtain medical attention.

Skin Contact: Remove contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Quickly and gently blot or brush away excess chemical. Wash gently and thoroughly with lukewarm gently flowing water and non-abrasive soap for 5 minutes. If irritation persists, repeat flushing. Obtain medical advice. Completely decontaminate clothing, shoes and leather goods before reuse or else discard.

Inhalation: Remove victim from exposure area to fresh air immediately. If breathing has stopped, trained personnel should begin artificial respiration. Medical oxygen may be administered by trained personnel, where breathing is difficult. If the heart has stopped, immediately start cardiopulmonary resuscitation (CPR), or automated external defibrillation (AED). Avoid mouth-to-mouth contact by using mouth guard or shields. Quickly transport victim to an emergency care facility.

Ingestion: Never give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. Have victim drink 2 – 8 oz. (60 – 240 ml) of water. If vomiting occurs naturally, have victim rinse mouth with water again. Immediately obtain medical attention and bring a copy of this MSDS.

SECTION 5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Mercurous chloride is not considered a fire or explosion hazard. However, it decomposes on heating, producing toxic fumes of chlorine and mercury.

Extinguishing Media: Use any means of extinction appropriate for surrounding fire conditions such as water spray, carbon dioxide, dry chemical or foam. If possible, move material from fire area. Cool any containers that are exposed to heat or flames by the application of water streams until well after the fire has been extinguished. Do not release runoff from fire control methods to sewers or waterways.

Fire Fighting: Toxic fumes may result from a fire situation. 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 facepiece mask. Do not allow water run-off to enter sewers or watercourses.

Flashpoint and Method: Not Applicable.

Upper and Lower Flammable Limit: Not Applicable.

Autoignition Temperature: Not Applicable.

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. Avoid contact with any spilled material. Do NOT wash away into sewers or drains. Collect spilled material in a safe manner, using methods which will minimize dust generation (e.g., vacuum solids). 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. Workers should wash and change clothing following cleanup of a spill to prevent personal contamination with mercurous chloride dust.

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.

Environmental Precautions: This compound can pose a threat to the environment. Contamination of water, soil, and air should be prevented.

SECTION 7. HANDLING AND STORAGE

Store mercurous chloride in tightly-closed containers in a secure, dark, dry, cool, covered, and well-ventilated area, away from incompatible materials. Material is a severe marine pollutant. Store well away from any rivers, streams or other watercourses. Avoid dust generation and accumulation. 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 only. This product may

contain entrained moisture at a pH of approximately 1.0. Therefore, handling and storage practices should protect against the potential for acidic corrosion.

EU Safety Phrase(s): S13 - Keep away from food, drink, and animal feeding stuffs, S24/25 - Avoid contact with skin and eyes, S46 - If swallowed, seek medical advice immediately and show this container or label; S61 – Avoid release to the environment. Refer to special instructions/Safety data sheets.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

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 should be worn to prevent eye contact if excessive dust is generated or where any possibility exists that eye contact may occur. An eyewash and quick drench shower should be provided near the work area. Workers should wash immediately when skin becomes contaminated as well as at the end of each work shift. Work clothing should be removed before leaving the plant site and should be changed daily and laundered before reuse if there is a reasonable probability that the clothing may be contaminated. If using a commercial or industrial laundry service, inform laundry personnel of contaminants' hazards. Safety type boots are recommended.

Ventilation: Use adequate local or general ventilation to maintain the concentration of mercurous chloride dust in the working environment well below recommended occupational exposure limits. Supply sufficient replacement air to make up for air removed by the exhaust system.

Respirators: Where mercurous chloride dust is generated and cannot be controlled to within acceptable levels, use appropriate NIOSH-approved respiratory protection equipment (a 42 CFR 84 Class N, R or P-95 particulate filter cartridge). NOTE: Where mercury vapour is also present at the same time, mercury vapour cartridges should be added behind the particulate filter.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Heavy white-grey solid	Odour: None	Physical State: Solid	pH: May contain entrained moisture at pH 1.0
Vapour Pressure: 0.0089mm at 100 °C	Vapour Density: Not Applicable	Boiling Point/Range: No Information Available	Melting Point/Range: 400-500 °C (sublimes without melting)
Specific Gravity: 7.15	Evaporation Rate: Not Applicable	Coefficient of Water/Oil Distribution: Not Applicable	Odour Threshold: None
Solubility in Water: 0.0002g/100ml			

SECTION 10. STABILITY AND REACTIVITY

Stability and Reactivity: Mercurous chloride is stable and not considered reactive under normal temperatures and pressures. Sunlight causes slow decomposition into mercuric chloride and metallic mercury. Hazardous polymerization or runaway reactions will not occur.

Incompatibilities: Mercurous chloride is incompatible with bromides, iodides, alkali chlorides, sulphates, sulphites, sulphides, carbonates, hydroxides or alkalis, ammonia, cyanides, silver, lead and copper salts, lime water, iodine and hydrogen peroxide. On contact with solutions of iodides, bromides, cyanides, or alkali chlorides it decomposes to metallic mercury. Excessive heat should be avoided.

Hazardous Decomposition Products: Excessive heat produces toxic fumes of chlorine and mercury.

SECTION 11. TOXICOLOGICAL INFORMATION

General: A skin, eye and respiratory irritant with both acute and chronic health effects. The primary route of exposure is by inhalation of the dust. However, it can also be absorbed into the body by ingestion and through the skin.

Acute:

Skin/Eye: Exposure causes eye and skin irritation with redness and pain. Severe exposure may produce burns and possible eye tissue damage. Allergic reactions have also been reported as a possible side effect. Mercurous chloride can be absorbed through the skin with symptoms mimicking those from inhalation or ingestion.

Inhalation: Exposure to dust or fume is irritating to the nose, throat and respiratory tract with dryness and irritation of the nose and throat, tightness of the chest, sore throat, coughing, and difficult breathing. Gastrointestinal effects have also been noted, which include loss of appetite, nausea, and vomiting. Effects on the nervous system can result in tremors, irritability, and headaches. Severe, acute exposures may produce pneumonitis.

Ingestion: May cause burning of the mouth, nausea, vomiting, abdominal pain and bloody diarrhea. Renal effects in humans have been observed following acute exposure to inorganic mercury and mercury compounds. Mercury can also affect the nervous system, resulting in tremors and irritability.

Chronic:

Prolonged or repeated exposure to mercurous chloride can cause kidney damage, including proteinuria and glomerular dysfunction. Chronic exposure may lead to renal failure and effects on the central nervous system, which include tremors, irritability, personality and behavioural changes, memory loss and decreased nerve conduction. Mercurous chloride is not listed as a human carcinogen 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 EU.

SECTION 12. ECOLOGICAL INFORMATION

Mercurous chloride has very low solubility in water; however, chemical and biological processes in both aquatic and terrestrial environments can greatly increase the bioavailability of the constituent mercury. This compound can pose significant ecological risks, since mercury readily bioaccumulates in both aquatic and terrestrial food chains.

A process known as biomethylation involves the formation of organo-mercury compounds (e.g., methyl mercury) from inorganic compounds in the environment, such as mercurous chloride; this is mediated by sulfate bacteria which live in low oxygen environments. Methyl mercury is particularly toxic and is the dominant compound implicated in the environmental bioaccumulation of mercury.

SECTION 13. DISPOSAL CONSIDERATIONS

If material cannot be returned to process or salvage, dispose of only in accordance with applicable regulations.

SECTION 14. TRANSPORT INFORMATION

PROPER SHIPPING NAME (Canada, U.S. and IMO) Environmentally Hazardous Substance, Solid, n.o.s.
(Mercurous Chloride)
HAZARD CLASSIFICATION (Canada, U.S. and IMO) Class 9, Packing Group III
PRODUCT IDENTIFICATION NUMBER UN3077
MARINE POLLUTANT Yes, Severe

Note: Teck ships this material under a permit issued pursuant to the Export and Import of Hazardous Wastes and Hazardous Recyclable Materials Regulations under the Canadian Environmental Protection Act, 1999.

SECTION 15. REGULATORY INFORMATION

U.S.

INGREDIENT LISTED ON TSCA INVENTORY..... Yes
HAZARDOUS UNDER HAZARD COMMUNICATION STANDARD..... Mercurous Chloride..... Yes
CERCLA SECTION 103 HAZARDOUS SUBSTANCES Mercury Compounds..... Yes.....RQ: None Assigned
EPCRA SECTION 302 EXTREMELY HAZARDOUS SUBSTANCE No
EPCRA SECTION 311/312 HAZARD CATEGORIES Immediate (Acute) Health Hazard – Toxic
EPCRA SECTION 313 TOXIC RELEASE INVENTORY..... Mercury Compounds (Mercurous Chloride)
CAS No. 10112-91-1
Percent by Weight - 90 to 95

CANADIAN

INGREDIENTS LISTED ON DOMESTIC SUBSTANCES LIST Yes

WHMIS CLASSIFICATION: D1B (Toxic Material)

EUROPEAN UNION:

INGREDIENTS LISTED ON THE EUROPEAN INVENTORY
OF EXISTING COMMERCIAL CHEMICAL SUBSTANCES (EINECS).... Yes

EU CLASSIFICATION..... Harmful, Irritant, Dangerous for the Environment

SECTION 16. OTHER INFORMATION

The information in this Material 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, 2009, Guide to Occupational Exposure Values.
- American Conference of Governmental Industrial Hygienists, Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, 2009.
- Commission de la santé et la sécurité du travail, Service du répertoire toxicologique, Calomel, 2006-01.
- European Economic Community, Commission Directives 91/155/EEC and 67/548/EEC.
- Industry Canada, Controlled Products Regulations, SOR/88-66, as amended.
- International Chemical Safety Cards (WHO/IPCS/ILO), ICSC:0984 – Mercurous Chloride (Peer reviewed April 2002).
- International Labour Office (WHO/ILO) Encyclopedia of Occupational Health & Safety 4th Ed. CD-ROM Version (1998).
- Merck & Co., Inc., 2001, The Merck Index, An Encyclopedia of Chemicals, Drugs, and Biologicals, 13th Edition.
- National Library of Medicine, National Toxicology Information Program, Hazardous Substance Data Bank (on-line version).
- Patty's Toxicology, Fifth Edition, 2001, Bingham, Cohrssen & Powell (Eds).
- U.S. Coast Guard, Chemical Hazards Response Information System (CHRIS), Record No. 787, Mercurous Chloride.
- U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry, Update Toxicological Profile for Mercury. (March 1999).
- U.S. Occupational Safety and Health Administration, 1989, Code of Federal Regulations, Title 29, Part 1910.

Notice to Reader

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