Teck

ZINC SULPHATE SOLUTION
MATERIAL SAFETY DATA SHEET

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product Identity: Zinc Sulphate Solution.

NOTE: In the form in which it is sold this product is not regulated. This Material Safety Data Sheet is provided for information purposes only.

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

Supplier:
Teck American Incorporated
Industrial Chemicals
501 North Riverpoint Blvd., Suite 300,
Spokane, WA. 99202
Emergency Telephone: 250-364-4214

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

Date of MSDS Preparation: July 6, 2010.

Product Use: Production of zinc fertilizers.

SECTION 2. COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient	Approximate Percent by Weight	CAS Number	Occupational Exposure Limits (OELs)		LD_{50} / LC_{50} Species and Route	
Zinc Sulphate	29- 34%	7733-02-0	OSHA PEL	None Established	LD_{50}, rat, oral	1,538 mg/kg
			ACGIH TLV	None Established	LD_{50}, mouse, oral	832 mg/kg
			NIOSH REL	None Established		
Magnesium Sulphate	0.4- 1.5%	7487-88-9	OSHA PEL	None Established	LD_{50}, mouse, oral	>5,000 mg/kg
			ACGIH TLV	None Established	LD_{50}, rabbit, oral	>3,000 mg/kg
			NIOSH REL	None Established		
Manganese Sulphate	0.3-0.5%	7785-87-7	OSHA PEL	5 mg/m³ **C** (as Mn)	LD_{50}, rat, oral	2,150 mg/kg.
			ACGIH TLV	0.2 mg/m³ (as Mn)	LD_{50}, mouse, oral	2,330 mg/kg.
			NIOSH REL	1 mg/m³ TWA (as Mn) 3 mg/m^3 STEL(as Mn)		

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: Zinc Sulfate Solution, Zinc Electrolyte, Neutral Zinc Sulfate.

SECTION 3. HAZARDS IDENTIFICATION

Emergency Overview: A clear or slightly opaque solution that does not burn or readily decompose. It consists principally of dissolved zinc sulphate. The solution is relatively non-toxic to humans and poses little immediate hazard to personnel in an emergency situation but contains a high concentration of dissolved zinc and can pose a threat to watercourses.

Potential Health Effects: Direct eye contact with the solution may cause mild eye irritation. Dried residues may cause eye, nose & throat irritation and, when heated strongly in air, will generate zinc oxide fume. Inhalation of freshly formed zinc oxide fume can result in metal fume fever, a temporary flu-like condition (see Toxicological Information, Section 11).

Potential Environmental Effects: As this product is a solution, the contained zinc, in elevated concentrations, is directly bioavailable and is potentially toxic to aquatic and soil organisms and plants (see Ecological Information, Section 12).

SECTION 4. FIRST AID MEASURES

Eye Contact: No effects expected. If irritation occurs, flush contaminated eye(s) with lukewarm, gently flowing water for 5 minutes. If irritation persists, obtain medical advice.

Skin Contact: No health effects expected. If irritation does occur, flush with lukewarm, gently flowing water for 5 minutes. If irritation persists, obtain medical advice.

Inhalation: If symptoms are experienced, remove source of contamination or move victim to fresh air. Obtain medical advice.

Ingestion: If swallowed, no specific intervention is indicated as this material is not likely to be hazardous by ingestion. Do not induce vomiting. However, ingestion of zinc sulphate may lead to spontaneous vomiting. When vomiting occurs naturally, rinse mouth with water. If irritation or discomfort occurs, obtain medical advice.

SECTION 5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Product 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: As with any fire, fire fighters should 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.

Flashpoint and Method: Not Applicable.

Upper and Lower Flammable Limit: Not Applicable.

Autoignition Temperature: Not Applicable.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Procedures for Cleanup: Stop release if possible to do so safely. Contain spill, isolate hazard area, and deny entry. Pump back into system if possible. Otherwise absorb with any suitable absorbent such as vermiculite or clay. Place contaminated material in suitable, labeled containers for final disposal. Dispose of waste material consistent with the requirements of waste disposal authorities.

Personal Precautions: Impervious chemical-resistant gloves, rubber boots and coveralls or other protective clothing are recommended for persons responding to an accidental release (see also Section 8). Close-fitting safety goggles may be necessary in some circumstances to prevent eye contact with the solution.

Environmental Precautions: Spilled product can pose immediate risks to aquatic and terrestrial environments. Released product should be prevented from reaching soil or entering watercourses in the vicinity of product handling areas.

SECTION 7. HANDLING AND STORAGE

Store in a dry, cool, well-ventilated area away from incompatible substances.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Protective Clothing: Impervious, chemical-resistant gloves are recommended when handling bulk solution. Eye protection should be worn where mist is generated and where any possibility exists that eye contact may occur.

Ventilation: Use adequate local or general ventilation to maintain the concentration of aerosol mists well below recommended occupational exposure limits.

Respirators: Where liquid aerosol mists are generated and cannot be controlled to within acceptable levels, use appropriate NIOSH-approved respiratory protection equipment (42 CFR 84 Class N, R or P-95 particulate filter as a minimum).

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Clear to slightly opaque liquid	**Odour:** None	**Physical State:** Liquid	**pH:** Approx. 4.5 – 5.0
Vapour Pressure: Negligible @ 20°C	**Vapour Density:** Not Applicable	**Boiling Point/Range:** No Data	**Freezing Point/Range:** No Data
Specific Gravity: 1.250- 1.35	**Evaporation Rate:** Not Applicable	**Coefficient of Water/Oil Distribution:** No Data	**Odour Threshold:** Not Applicable
Solubility in Water: Aqueous Solution			

SECTION 10. STABILITY AND REACTIVITY

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

Incompatibilities: None have been identified.

Hazardous Decomposition Products: High temperature operations such as oxy-acetylene cutting, electric arc welding or overheating of dried residues will generate zinc oxide fume which, on inhalation in sufficient quantity, can produce metal fume fever. Under such conditions, sulphur dioxide will also be generated and can cause respiratory distress.

SECTION 11. TOXICOLOGICAL INFORMATION

General: In the form in which this product is sold it is relatively non-toxic. The major route of exposure would be through the generation and inhalation of aerosol mist, or the generation of zinc oxide fume through welding or burning around dried residues.

Acute:
Skin/Eye: Contact with liquid may cause local irritation but would not cause tissue damage. Dust or fume from burning or welding on dried residues may also cause local irritation.

Inhalation: Acute inhalation of mists will result in irritation of the nose, throat and upper respiratory passages. Symptoms may include discomfort, coughing, tingling sensation, sneezing and/or shortness of breath and wheezing. Excessive heating of dried zinc sulphate residues will generate zinc oxide fume. If inhaled, this fume can result in the condition called metal fume fever. The symptoms of metal fume fever will occur within 3 to 10 hours of exposure, and include immediate dryness and irritation of the throat, tightness of the chest, and coughing which may later be followed by flu-like symptoms of fever, malaise, perspiration, frontal headache, muscle cramps, low back pain, occasionally blurred vision, nausea, and vomiting. The symptoms are temporary and generally disappear, without medical intervention, within 24 to 48 hours of onset. There are no recognized complications, after affects, or chronic affects that result from this condition.

Ingestion: Zinc sulphate is very astringent, and when ingested in excessive quantities, can irritate the stomach, resulting in nausea and spontaneous vomiting.

Chronic: Prolonged skin contact with zinc sulphate solution may cause skin dermatitis. Zinc, magnesium and manganese are not listed as carcinogens by the Occupational Safety and Health Administration (OSHA), the National Toxicology Program (NTP), the International Agency for Research on Cancer (IARC), or the American Conference of Governmental Industrial Hygienists (ACGIH).

SECTION 12. ECOLOGICAL INFORMATION

In elevated concentrations, zinc sulphate in solution is potentially toxic to aquatic and terrestrial organisms. However, processes in the environment may alter its bioavailability in diluted form. In aquatic systems, zinc has the potential to bioaccumulate in both plants and animals. In terrestrial systems, the mobility of zinc in soil depends primarily on soil conditions, such as cation exchange capacity, pH, redox potential, and chemical species present in the soil. Zinc also bioaccumulates in terrestrial plants, vertebrates, and mammals, with plant uptake from soil dependent on plant species, soil pH, and soil composition.

SECTION 13. DISPOSAL CONSIDERATIONS

Do not wash down drain. Dike area around spill and pump uncontaminated solution back to process if possible, then absorb any remaining liquid in a solid absorbent such as vermiculite or clay. Place contaminated material in suitable, labeled containers for final disposal. Dispose of waste material consistent with the requirements of waste disposal authorities.

SECTION 14. TRANSPORT INFORMATION

TRANSPORT CANADA CLASSIFICATION..... Not regulated
US DOT HAZARD CLASSIFICATION ..... Class 9, Packing Group III (RQ)
SHIPPING NAME U.S. DOT ..... Environmentally Hazardous Substance, Liquid, n.o.s. (contains Zinc Sulfate)
US DOT PRODUCT IDENTIFICATION NUMBER..... UN3082
MARINE POLLUTANT (U.S.)..... No
IMO CLASSIFICATION..... Not regulated

SECTION 15. REGULATORY INFORMATION

U.S.
INGREDIENTS LISTED ON TSCA INVENTORY ..... Yes

HAZARDOUS UNDER HAZARD COMMUNICATION STANDARD..... No Ingredients Qualify

CERCLA SECTION 103 HAZARDOUS SUBSTANCES ..... Zinc Sulfate..... RQ: 1,000lbs.
Manganese Compounds... RQ: None Assigned

EPCRA SECTION 302 EXTREMELY HAZARDOUS SUBSTANCE ..... No Ingredients Qualify

EPCRA SECTION 311/312 HAZARD CATEGORIES..... No Hazard Categories Apply

EPCRA SECTION 313 TOXIC RELEASE INVENTORY..... Zinc Compounds (Zinc Sulfate)
CAS No. 7733-02-0
Percent by Weight..... 29-34%

Manganese Compounds (Manganese Sulfate)
CAS No. 7785-87-7
Percent by Weight..... 0.3-0.5%

CANADIAN:
INGREDIENTS LISTED ON DSL..... Yes

WHMIS CLASSIFICATION: ..... Not a Controlled Product

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, Seventh Edition plus updates.
- American Conference of Governmental Industrial Hygienists, 2010, Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices.
- American Conference of Governmental Industrial Hygienists, 2009, Guide to Occupational Exposure Values.
- Bretherick's Handbook of Reactive Chemical Hazards, 20th Anniversary Edition. (P. G. Urben Ed.) 1995.
- Canadian Centre for Occupational Health and Safety (CCOHS) CHEMpendium Chemical Information Data Base, 2010.
- Industry Canada, SOR/88-66, Controlled Products Regulations, as amended.
- International Agency for Research on Cancer (IARC), Monograms on the Evaluation of the Carcinogenic Risk of Chemicals to Man, 1972 – 2010, (multi-volume work), World Health Organization, Geneva.
- Merck & Co., Inc., 2001, The Merck Index, An Encyclopedia of Chemicals, Drugs, and Biologicals, Thirteenth Edition.
- Patty's Toxicology, Fifth Edition, 2001: E. Bingham, B. Cohrssen & C.H. Powell, Ed.
- 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) online version last accessed 2010-06-29.

- U.S. Department of Health and Human Services, National Institute for Occupational Safety and Health, National Toxicology Program (NTP), 11th Report on Carcinogens, January 2005.
- U.S. Occupational Safety and Health Administration, 1989, Code of Federal Regulations, Title 29, Part 1910.

Notice to Reader

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