

## AMMONIUM BISULFITE SOLUTION MATERIAL SAFETY DATA SHEET

### SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Identity:** This MSDS applies to the following grades of Ammonium Bisulfite Solution:

- 44% Ammonium Bisulfite
- 68% Ammonium Bisulfite

**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

**MSDS Preparer:**

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

**Date of Last Review/Edit:** December 10, 2009.

**Product Use:** Used as a chemical additive in the gold industry cyanide destruction process, as a food processing additive and preservative, and as a photographic chemical.

### SECTION 2. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous Ingredient	Approximate Percent by Weight	CAS Number	Occupational Exposure Limits (OELs)		LD <sub>50</sub> / LC <sub>50</sub> Species and Route
Ammonium Bisulfite	40-70%	10192-30-0	OSHA PEL ACGIH TLV NIOSH REL	None Established None Established None Established	No Data

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:** Ammonium hydrogen sulfite solution, ammonium acid sulfite solution, monoammonium sulfite solution, NH<sub>4</sub>HSO<sub>3</sub> solution, sulfurous acid monoammonium salt solution.

### SECTION 3. HAZARDS IDENTIFICATION

**Emergency Overview:** A colorless or pale yellow aqueous solution with a possible odor of sulfur dioxide (SO<sub>2</sub>). Non-combustible but excessive heating may liberate SO<sub>2</sub> gas that is strongly irritating to the eyes and mucous membranes. The solution itself is relatively non-toxic and poses little immediate hazard to personnel in an emergency situation. However, the solution is mildly acidic and contains high levels of ammonium ions which would be harmful to aquatic life, particularly fish.

**Potential Health Effects:** Inhalation will irritate the nose, throat and respiratory tract. Skin and eye contact will cause irritation. Sulfiting agents have been reported to cause reactions in sensitive individuals, even when ingested at very low concentrations. This material is not listed as a human carcinogen by OSHA, NTP, ACGIH, or IARC (see Toxicological Information, Section 11).

**Potential Environmental Effects:** This solution is considered to be mildly acidic (i.e., pH – 4.0 to 6.0), however, it contains relatively high concentrations of the ammonium ion, which can be potentially harmful to aquatic organisms, particularly fish. Both the solution itself, and aqueous run-off from an emergency response action, could pose a threat to aquatic organisms residing in nearby natural watercourses. (See Ecological Information, Section 12)

## 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 5 minutes, while holding the eyelid(s) open. Obtain medical advice.

**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 source of contamination or move victim from exposure area to fresh air immediately. If breathing has stopped, trained personnel should begin artificial respiration. If the heart has stopped, immediately start cardiopulmonary resuscitation (CPR), or automated external defibrillation (AED). 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. Obtain medical advice and bring a copy of this MSDS.

## SECTION 5. FIRE FIGHTING MEASURES

**Fire and Explosion Hazards:** This 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. Cool any containers that are exposed to heat or flames by the application of water streams until well after the fire has been extinguished.

**Fire Fighting:** Toxic fumes of sulfur dioxide and nitrogen oxides may be released from this product in a fire situation. Firefighters 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:** Stop release if possible to do so safely. Contain spill, isolate hazard area, and deny entry. Pump back into system if possible. Otherwise, neutralize with alkali such as sodium carbonate or sodium bicarbonate, soda ash, lime or limestone granules. Dispose of spilled material and neutralization residues in accordance with applicable regulations.

**Personal Precautions:** Protective clothing, gloves, and a combination acid gas/P95 or p-100 respirator are recommended for persons responding to an accidental release (see also Section 8). Splash goggles and/or face shield should be worn to prevent eye contact with mist or spray where splashing is possible.

**Environmental Precautions:** Constituents of this product can potentially pose risks to organisms in the aquatic environment. Discharge of the compound to water and air should be prevented. When implementing any emergency response actions, do not allow aqueous run-off to enter sewers or natural watercourses.

## SECTION 7. HANDLING AND STORAGE

Store in a dry, cool, well-ventilated area away from acids and strong oxidizers. Keep containers tightly closed. Prolonged exposure to the atmosphere will slowly oxidize this product, releasing sulfur dioxide gas. Empty and clean containers of all residues before adding other materials to the container to avoid potentially dangerous reactions. 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.

## SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**Protective Clothing:** Protective clothing, splash goggles, and impervious gloves are recommended when handling bulk solution. Appropriate protective clothing should be worn where any possibility exists that skin contact might occur. Eye protection should be worn where mist is generated and where any possibility exists that eye contact might occur. An eyewash and quick drench shower should be provided. Workers should wash immediately when skin becomes contaminated and at the end of each work shift. Work clothing should be removed immediately if it becomes contaminated and should be changed daily if there is reasonable probability that the clothing may be contaminated.

**Ventilation:** Use adequate local or general ventilation to maintain the concentration of ammonium bisulfite aerosol mists and sulfur dioxide below recommended occupational exposure limits.

**Respirators:** Where sulfur dioxide or liquid aerosol mists are generated and cannot be controlled to within acceptable levels, use appropriate NIOSH-approved respiratory protection equipment (combined 42 CFR 84 Class N, R or P-95 or P100 filter and acid gas cartridge).

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance:</b> Colorless to pale yellow liquid	<b>Odor:</b> Possible odor of SO <sub>2</sub>	<b>Physical State:</b> Liquid	<b>pH:</b> 4.0 to 6.0
<b>Vapor Pressure:</b> Not Applicable	<b>Vapor Density:</b> Not Applicable	<b>Boiling Point/Range:</b> Decomposes at 82°C	<b>Freezing Point/Range:</b> No Data
<b>Specific Gravity:</b> 1.2 to 1.4	<b>Evaporation Rate:</b> Not Applicable	<b>Coefficient of Water/Oil Distribution:</b> Not Applicable	<b>Odor Threshold:</b> 0.5 ppm (SO <sub>2</sub> )
<b>Solubility in Water:</b> Aqueous solution			

## SECTION 10. STABILITY AND REACTIVITY

**Stability & Reactivity:** This material is stable and not considered reactive under normal temperatures and pressures. Hazardous polymerization or runaway reactions will not occur. However, it may decompose if heated above 82°C. Prolonged exposure to the atmosphere will slowly oxidize this product, releasing sulfur dioxide gas.

**Incompatibilities:** Avoid contact with acids - may liberate sulfur dioxide. Also avoid strong oxidizers and materials that react violently with water. Ammonium bisulfite is not compatible with copper, zinc or their alloys (i.e. bronze, brass, galvanized metals, etc.).

**Hazardous Decomposition Products:** Excessive heat may liberate sulfur dioxide gas which is toxic and corrosive.

## SECTION 11. TOXICOLOGICAL INFORMATION

**General:** A skin, eye and mucous membrane irritant. Only moderately toxic by ingestion but may cause a severe allergic reaction in some asthmatics and others who are hypersensitive to sulfites. Hazards are largely those from acute exposure or direct contact rather than chronic or repeated low level exposure. The potential for exposure to sulfur dioxide must always be considered as well, particularly when the solution may become overheated.

### Acute:

**Skin/Eye:** Exposure to mists or aerosols of this solution will cause eye irritation with possible discomfort, tearing, or blurring of vision. Direct skin contact with the solution causes irritation with discomfort, reddening and, rarely, an allergic reaction. Prolonged contact may cause chemical burns to eye and skin tissue.

**Inhalation:** Acute inhalation of mists or released SO<sub>2</sub> will result in irritation of the nose, throat and upper respiratory passages. Symptoms may include discomfort, coughing, wheezing, shortness of breath and tightness in the chest.

**Ingestion:** Ingestion of ammonium bisulfite solution will irritate the gastrointestinal tract due to the liberation of sulfurous acid. Large doses may cause nausea and vomiting. May cause a severe allergic reaction in some asthmatics and sulfite-sensitive persons with symptoms of broncho constriction, bronchospasm, gastrointestinal disturbances, flushing, hypotension, tingling sensation, urticaria/angioedema and shock.

**Chronic:** Symptoms from chronic exposure will be similar to those of acute exposure. Ammonium bisulfite 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), or the International Agency for Research on Cancer (IARC).

## SECTION 12. ECOLOGICAL INFORMATION

This product is a slightly acidic solution that has the potential to be toxic to aquatic organisms (in particular, fish), based on its ammonium ion content, that has the potential to convert to free ammonia. Moreover, its sulfite ion constituent can result in elevated chemical oxygen demand and pH reduction, on oxidation to sulfate.

## SECTION 13. DISPOSAL CONSIDERATIONS

Do not wash down drain. Dispose of waste solution or contaminated soil in accordance with local regulatory requirements.

## SECTION 14. TRANSPORT INFORMATION

Proper Shipping Name under Transport Canada and U.S. DOT..... Bisulfites, aqueous solutions, n.o.s. (Ammonium Bisulfite)  
Hazard Classification Transport Canada and U.S. DOT ..... Class 8, Packing Group III  
Product Identification Number ..... UN2693  
Marine Pollutant ..... Yes (IMO)  
IMO Classification ..... Class 8

## SECTION 15. REGULATORY INFORMATION

### U.S.:

Listed on TSCA Inventory ..... Yes  
Hazardous under OSHA Hazard Communication Standard..... Yes  
CERCLA Section 103 Hazardous Substance..... Yes.....RQ: 5000 lb. (2270 kg.)  
EPCRA Section 302 Extremely Hazardous Substance ..... No  
EPCRA Section 312 Hazard Categories ..... Immediate (acute) health hazard –Irritant  
EPCRA Section 313 Toxic Release Inventory (Supplier Notification) ..... Ammonium (Ammonium Bisulfite Solution)  
CAS No. 10192-30-0  
Percent by Weight:.....68% (this notification applicable to the 68% grade only)

### CANADIAN:

Listed on Domestic Substances List..... Yes  
WHMIS Classification:..... Controlled Product, Classification E  
This product must be classified as a corrosive (Class E) under WHMIS because it is designated as such under the Transportation of Dangerous Goods (TDG) regulations. However, in practical applications, it can be considered an eye and skin irritant.

## SECTION 16. OTHER INFORMATION

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

- American Conference of Governmental Industrial Hygienists, 2009, Guide to Occupational Exposure Values.
- American Conference of Governmental Hygienists, 2009, 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. Urben Ed.) 1995.
- Industry Canada, SOR/88-66, Controlled Products Regulations, as amended.
- International Chemical Safety Cards (WHO/IPCS/ILO), ICSC: 1254 Ammonium Bisulfite. (March 1995).
- Merck & Co., Inc., 2001, The Merck Index, An Encyclopedia of Chemicals, Drugs, and Biologicals, Thirteenth Edition.

- National Library of Medicine, National Toxicology Information Program, 2003, Hazardous Substance Data Bank. HSDB # 486.
- Patty's Toxicology, Fifth Edition, 2001: E. Bingham, B. Cohnsen & 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. Occupational Safety and Health Administration, 1989, Code of Federal Regulations, Title 29, Part 1910.

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