

NFPA Classification	DOT / TDG Pictograms	WHMIS Classification	HMIS		PROTECTIVE CLOTHING
			Health Flammability Reactivity PPE	2 0 0 E	

## Section I. Chemical Product and Company Identification

**PRODUCT NAME/ TRADE NAME** Ultra Yield Copper Oxy-Sulfate 20%

**SYNONYM** Copper oxysulfate

**MSDS NUMBER:** 14168

**CHEMICAL NAME** Copper oxide sulfate

**REVISION NUMBER** 4.7

**CHEMICAL FAMILY** Metal salt.

**MSDS prepared by** January 25, 2007  
the Environment,  
Health and Safety  
Department on:

**CHEMICAL FORMULA** Not available.

### 24 HR EMERGENCY TELEPHONE NUMBER:

**MATERIAL USES** Agricultural use: Fertilizer ingredient.

**Transportation Emergency: 1 (800) 792-8311**  
**Medical Emergency: 1 (888) 670-8123**

#### MANUFACTURER

Agrium  
North American Wholesale  
13131 Lake Fraser Drive, S.E.  
Calgary, Alberta, Canada, T2J 7E8

#### SUPPLIER

Agrium  
North American Wholesale  
13131 Lake Fraser Drive, S.E.  
Calgary, Alberta, Canada, T2J 7E8

Agrium U.S. Inc.  
Suite 1700, 4582 South Ulster St.  
Denver, Colorado, U.S.A., 80237

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## Section II. Hazardous Ingredients

NAME	CAS #	Exposure Limits (ACGIH)						% by Weight
		TLV-TWA mg/m <sup>3</sup>	TLV-TWA ppm	STEL mg/m <sup>3</sup>	STEL ppm	CEIL mg/m <sup>3</sup>	CEIL ppm	
Copper sulfate	7758-98-7	1 as Cu						5-10 as Cu
Zinc sulfate	7733-02-0	N/A						10-30

#### ACGIH TLV notations:

---- No assigned TLV

(C) - Ceiling - the concentration not to be exceeded at any time

(I) - measured as the Inhalable fraction of the aerosol

(R) - measured as the Respirable fraction of the aerosol

(T) - measured as the Thoracic fraction of the aerosol

#### TOXICOLOGICAL DATA ON INGREDIENTS

Copper sulfate:

ORAL (LD50): Acute: 300 mg/kg [Rat], RTECS.

Zinc sulfate:

ORAL (LD50): Acute: 1710 mg/kg [Rat], RTECS.

**Section III. Hazards Identification.**

<b>POTENTIAL ACUTE HEALTH EFFECTS</b>	<p>Inhalation of dust and mists of copper salts can cause irritation of the nasal membranes, the throat, and on occasion, ulceration of the nasal septum. If copper salts reach the gastrointestinal tract, they can act as irritants producing salivation, nausea, vomiting, gastric pain, hemorrhagic gastritis, and diarrhea. In humans, a metallic taste, nausea, vomiting, and stomach pain are the first symptoms reported in nearly all cases of acute over-exposure. Severe and possibly life threatening liver and kidney damage may result from ingestion unless promptly treated. May cause severe irritation on eye contact, but irritation subsides on removal. May cause skin irritation on contact.</p> <p>Fumes generated from high temperatures such as from welding and cutting on metals contaminated with this product may result in formation of zinc oxide fumes at levels above the occupational exposure limit, which can cause "metal fume fever", a flu-like condition involving fever, chills, sweats, nausea, vomiting, muscular aches and pains and breathing disturbance. Symptoms may appear a few hours after exposure and subside within 24-48 hours with no permanent effect.</p>
<b>POTENTIAL CHRONIC HEALTH EFFECTS</b>	<p>Chronic copper poisoning due to excessive intake is rarely seen in man. Chronic overdosage of copper salts in normal humans is unlikely to result in liver or kidney damage due to the capability of the body clearance mechanisms. However, a rare hereditary condition known as Wilson's disease makes individuals with this condition susceptible to toxic effects from copper at levels of exposure which cause no symptoms to others in the community.</p> <p>CARCINOGENIC EFFECTS: NONE by ACGIH, EPA, IARC, NTP, OSHA.  MUTAGENIC EFFECTS: NONE by ACGIH, EPA, IARC, NTP, OSHA.  TERATOGENIC EFFECTS: NONE by ACGIH, EPA, IARC, NTP, OSHA.</p>

**Section IV. First Aid Measures**

<b>EYE CONTACT</b>	Causes severe eye irritation. Avoid contact with eyes. Immediately flush eyes with plenty of water for at least 15 minutes. Get immediate medical attention.
<b>MINOR SKIN CONTACT</b>	Causes skin irritation. Avoid contact with skin. Wash with soap and water. Get medical attention if irritation develops or persists. Wash contaminated clothing before reusing.
<b>EXTENSIVE SKIN CONTACT</b>	No additional information.
<b>MINOR INHALATION</b>	Inhalation of dust may produce irritation, burning, sneezing and coughing. Long term exposure may cause headache, nausea or weakness. Loosen tight clothing. Allow to rest in a well ventilated area. Obtain medical attention if irritation persists.
<b>SEVERE INHALATION</b>	In emergency situations, use respiratory protection to evacuate the person to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the person is not breathing, perform artificial respiration. Seek medical attention.
<b>SLIGHT INGESTION</b>	<p>Do not induce vomiting. May cause digestive tract irritation, with accompanying nausea, vomiting and diarrhea. If spontaneous vomiting does occur, lower the head so that the vomit will not reenter the mouth and throat.</p> <p>If tolerated, give no more than 1 cup of milk or water for adults or 1/2 cup for children to rinse the mouth and throat, dilute the stomach contents, and minimize irritation. Obtain medical attention.</p>
<b>EXTENSIVE INGESTION</b>	No additional information.

**Section V. Fire and Explosion Data**

THE PRODUCT IS	Non-flammable.
AUTO-IGNITION TEMPERATURE	Not applicable.
FLASH POINT	Not applicable.
FLAMMABILITY LIMITS	Not applicable.
PRODUCTS OF COMBUSTION	Material will not burn. Undergoes thermal decomposition at elevated temperatures to release toxic gases.
FIRE HAZARD IN THE PRESENCE OF VARIOUS SUBSTANCES	Not applicable.
EXPLOSION HAZARD IN THE PRESENCE OF VARIOUS SUBSTANCES	This substance is non-explosive.
FIRE FIGHTING MEDIA AND INSTRUCTIONS	Not applicable. Fires involving this material may be extinguished by any means consistent with surrounding materials. As in any fire, wear MSHA/NIOSH approved pressure-demand self-contained breathing apparatus, or equivalent and full protective gear.
SPECIAL REMARKS ON FIRE HAZARDS	No additional information.
SPECIAL REMARKS ON EXPLOSION HAZARDS	No additional information.

**Section VI. Accidental Release Measures**

SMALL SPILL	Use appropriate tools or equipment to place the spilled solid in a suitable container for reuse or disposal. Flush or wash the contaminated surface. Recover wash water and dispose of according to local and regional authority requirements.
LARGE SPILL	Clean up spills immediately, observing precautions in Protective Equipment section. Cleanup personnel should be protected against dust inhalation and eye and skin contact. Recover and place material in suitable containers for recycle, reuse, or disposal. Release or discharge of this substance is subject to Federal, State or Provincial reporting requirements which may vary from region to region. Consult your environmental advisor as soon as an incident occurs to ensure compliance with reporting requirements. Ensure disposal is in compliance with government requirements and local regulations.

**Section VII. Handling and Storage**

PRECAUTIONS	Wear suitable protective clothing, gloves and eye/face protection. Avoid contact with skin and eyes. DO NOT breathe dust. After handling, always wash hands thoroughly with soap and water. Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. Use only in well ventilated areas. When using do not eat, drink or smoke.
STORAGE	Contains moisture sensitive material; store in a dry place. Product will absorb moisture and will cake when dried. Keep away from food, drink and animal feed. Keep container tightly closed. Keep out of reach of children.

**Section VIII. Exposure Controls/Personal Protection**

ENGINEERING CONTROLS	Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fumes or mist, use adequate local exhaust or general ventilation to keep exposure to airborne contaminants below the exposure limits.
PERSONAL PROTECTION	

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The selection of personal protective equipment varies, depending upon conditions of use. Wear appropriate respiratory protection for dust/mist when ventilation is inadequate. A filtering facepiece dust mask is recommended for most applications if respiratory protection is needed. Where skin and eye contact may occur as a result of brief periodic exposures, wear long sleeved clothing, coveralls, chemical resistant gloves, and safety glasses with side shields. A NIOSH/MSHA approved dust and mist respirator may be used under conditions where airborne concentrations may exceed occupational exposure limits. Protection provided by air purifying respirators may be limited. A positive pressure supplied air respirator should be used if concentrations are unknown or under any other other circumstances where air purifying respirators may be inadequate. A respiratory protection program that meets OSHA 29 CFR 1910.134 requirements must be followed whenever workplace conditions warrant a respirator's use.

**PERSONAL PROTECTION IN CASE OF LARGE RELEASE**

No additional information.

**EXPOSURE LIMITS**

Copper oxide:  
ACGIH TLV-TWA 1 mg/m<sup>3</sup>  
MI and Fed OSHA Permissible Exposure Limit: 1 mg/m<sup>3</sup> as Cu

Copper sulfate:  
ACGIH TV-TWA 1 mg/m<sup>3</sup> as Cu  
MI and Fed OSHA Permissible Exposure Limit: 1 mg/m<sup>3</sup> as Cu

Zinc oxide:  
ACGIH TLV-TWA 2 mg/m<sup>3</sup> as respirable dust  
Fed OSHA Permissible Exposure Limit: Table Z-1 8-hr Time Weighted Avg: 15 mg/m<sup>3</sup> as total dust, 5 mg/m<sup>3</sup> as respirable dust, and 5 mg/m<sup>3</sup> as fume.  
MI OSHA Permissible Exposure Limit: 8-hr Time Weighted Avg: 10 mg/m<sup>3</sup> as total dust, 5 mg/m<sup>3</sup> as respirable dust, and 5 mg/m<sup>3</sup> as fume.

Zinc sulfate:  
MI and Fed OSHA Permissible Exposure Limit: 15 mg/m<sup>3</sup> (as Particulates Not Otherwise Regulated)

Federal, State, and Provincial exposure limits may vary. Consult local officials for acceptable exposure limits in your jurisdiction.

**Section IX. Physical and Chemical Properties**

<b>PHYSICAL STATE AND APPEARANCE</b>	Granular solid.		
<b>MOLECULAR WEIGHT</b>	Not available.	<b>COLOR</b>	Dark brown or grey.
<b>pH (10% SOLN/WATER)</b>	4.0 - 5.0	<b>ODOR</b>	Metallic (Slight.)
<b>BOILING POINT</b>	Not applicable.	<b>ODOR THRESHOLD</b>	Not available.
<b>MELTING POINT</b>	Not available.	<b>TASTE</b>	Astringent. Nauseous metallic.
<b>CRITICAL TEMPERATURE</b>	Not applicable.	<b>VOLATILITY</b>	Not applicable.
<b>SPECIFIC GRAVITY g/cc</b>	1.28 (Water = 1)	<b>SOLUBILITY</b>	Partially soluble in cold water, hot water. (Total nutrient solubility, 25%).
<b>BULK DENSITY kg/m<sup>3</sup> ; lbs/ft<sup>3</sup></b>	80 lbs/ft <sup>3</sup> ; 1280 kg/m <sup>3</sup>	<b>DISPERSION PROPERTIES</b>	Not available.
<b>VAPOR PRESSURE</b>	Not applicable.	<b>WATER/OIL DIST. COEFF.</b>	Not available.
<b>VAPOR DENSITY</b>	Not applicable.		

**Section X. Stability and Reactivity Data**

STABILITY	The product is stable.
INSTABILITY TEMPERATURE	Not available.
CONDITIONS OF INSTABILITY	No additional information.
INCOMPATIBILITY WITH VARIOUS SUBSTANCES	Low hazard for usual industrial or commercial handling.
CORROSIVITY	Corrosive to iron and mild steel, aluminum, zinc, and copper.
SPECIAL REMARKS ON REACTIVITY	No additional information.
SPECIAL REMARKS ON CORROSIVITY	Contact your sales representative or metallurgical specialist to ensure compatibility with your equipment. Avoid contact with moisture. Slow hydrolysis will produce corrosive acids.

**Section XI. Toxicological Information**

SIGNIFICANT ROUTES OF EXPOSURE	Ingestion. Inhalation.
TOXICITY TO ANIMALS	See Section II.
SPECIAL REMARKS ON TOXICITY TO ANIMALS	No additional information.
OTHER EFFECTS ON HUMANS	No additional information is available in our database regarding other toxic effects of this material.
SPECIAL REMARKS ON CHRONIC EFFECTS ON HUMANS	No additional information.
SPECIAL REMARKS ON OTHER EFFECTS ON HUMANS	No additional information.

**Section XII. Ecological Information**

ECOTOXICITY	<p>May be harmful to livestock and wildlife if ingested. Clean up all spilled material, especially where bulk fertilizer loading of equipment occurs to prevent animal exposure.</p> <p>Aquatic/Marine Toxicity: U.S. D.O.T.: This material is listed as a Severe Marine Pollutant. Slightly soluble. Slow release to watercourses may cause effects down stream from the point of release. These effects may be limited by recovery of spilled material if recovery is conducted immediately. Toxic to fish and other water organisms.</p>
BOD and COD	Not available.
PRODUCTS OF DEGRADATION	Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise (some metallic oxides).
TOXICITY OF THE PRODUCTS OF DEGRADATION	No additional remarks.
SPECIAL REMARKS ON THE PRODUCTS OF DEGRADATION	No additional information.

**Section XIII. Disposal Considerations**

**WASTE DISPOSAL OR RECYCLING** Recover and place material in a suitable container for intended use or disposal. The disposal of the product must be made in an approved sanitary landfill or in a foundry in accordance with state, provincial and/or federal regulations. Consult your environmental advisor for information on disposal alternatives.

**Section XIV. Transport Information**

**DOT / TDG CLASSIFICATION** Not controlled under TDG (Canada) or D.O.T. (U.S.A.) when shipped in non-bulk packaging by air, rail, or land vehicle. If shipped by marine vessel, whether in bulk or non-bulk, the following classification applies:

Class 9

**PIN and Shipping Name** Not applicable, unless shipped by vessel. If shipped by marine transport:  
UN3077 Environmentally hazardous substances, solid, n.o.s.

**SPECIAL PROVISIONS FOR TRANSPORT** Not applicable unless shipped under Class 9 by vessel. If shipped by marine transport, the following provisions specified under 172.102 apply:  
8, 146, IB3, T4, TP1, TP29

**DOT (U.S.A.) (Pictograms)**

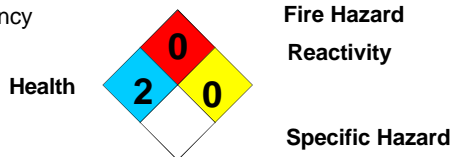


**Section XV. Other Regulatory Information and Pictograms**

**OTHER REGULATIONS** OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).  
EPA Federal Drinking Water Standards: Primary MCL 1.3mg/L (Action Level) as Copper; Secondary 5mg/L as zinc, 250mg/L as sulfate, 1.0 mg/L as copper  
CERCLA Reportable Quantities:  
10 lb or 4.54 kg. The rule for determining when notification is required is stated in 40 CFR 302.4 (section IV. D.3.b). [40 CFR 302.4 ]  
This material contains the following chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372:  
Copper compounds, chemical category code N100.  
Zinc compounds, chemical category code N982.  
Refer to EPA TRI guidance documents and the specific product analysis for your product to determine your reporting requirements under this regulation.  
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by the Controlled Products Regulations.

<b>OTHER CLASSIFICATIONS</b>	<b>HCS (U.S.A.)</b>	HCS CLASS: Irritating substance.
	<b>DSCL (EEC)</b>	Not available.

**National Fire Protection Association (U.S.A.)** Hazards presented under acute emergency conditions only:



**TDG (Pictograms - Canada)**



DSCL (Europe)  
(Pictograms)                      Not Available  
   No Disponible  
   Pas Disponible

ADR (Europe)  
(Pictograms)                      Not Available  
   No Disponible  
   Pas Disponible

### Section XVI. Other Information

**REFERENCES**

- Transportation of Dangerous Goods Act and Clear Language Regulations, current revision.
- Canada Gazette Part II, Vol. 122, No. 2 Registration SOR/88-64 31 December, 1987 Hazardous Products Act "Ingredient Disclosure List".
- Domestic Substances List, Canadian Environmental Protection Act.
- 29 CFR Part 1910
- 33 CFR Parts 151, 153, 154, 156
- 40 CFR Parts 1-799
- 46 CFR Part 153
- 49 CFR Parts 1-199
- American Conference of Governmental Industrial Hygienists, Threshold Limit Values for Chemical Substances, 2006.
- NFPA 704, National Fire Codes Online, National Fire Protection Association, current edition at time of MSDS preparation.
- Corrosion Data Survey, Sixth Edition, 1985, National Association of Corrosion Engineers
- TOMES® System: Heitland G & Hurlbut KM (Eds) (electronic version): MICROMEDEX, Greenwood Village, Colorado, USA. Available at: <http://csi.micromedex.com> (2007). The TOMES® System includes MEDITEXT® Medical Management; HAZARDTEXT® Hazard Management; INFOTEXT® Documents; ERG2000 Emergency Response Guidebook Documents; REPROTEXT®: Heitland G & Hurlbut KM (Eds); CHRIS Hazardous Chemical Data: U.S. Department of Transportation, U.S. Coast Guard, Washington, D.C. (2007); HSDB: Hazardous Substances Data Bank. National Library of Medicine, Bethesda, Maryland (2007); IRIS: Integrated Risk Information System. U.S. Environmental Protection Agency, Washington, D.C. (2007); NIOSH: Pocket Guide to Chemical Hazards. National Institute for Occupational Safety and Health, Cincinnati, Ohio (2007); OHM/TADS: Oil and Hazardous Materials Technical Assistance Data System. U.S. Environmental Protection Agency, Washington, D.C. (2007); REPROTOX®: Scialli A.R. Georgetown University Medical Center and Reproductive Toxicology Center, Columbia Hospital for Women Medical Center, Washington, D.C. (2007); RTECS®: Registry of Toxic Effects of Chemical Substances. National Institute for Occupational Safety and Health, Cincinnati, Ohio (2007); and SHEPARDS: Shepard T.H.: Shepard's Catalog of Teratogenic Agents (2007).
- The Fertilizer Institute Product Testing Program Results, March 2003
- Michigan Office of Regulatory Reform R325.51108

**OTHER SPECIAL CONSIDERATIONS**                      HMIS information added in this revision.

**FOR FURTHER SAFETY, HEALTH, OR ENVIRONMENTAL INFORMATION ON THIS PRODUCT, CONTACT**                      **AGRIUM**  
Wholesale Environment, Health and Safety  
Telephone (780) 998-6906 or Fax (780) 998-6677

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