

SDS DATE 29May2023

**SECTION 1: PRODUCT AND COMPANY IDENTIFICATION**

**PRODUCT NAME:** Total Antioxidant Capacity Assay  
**PRODUCT CODES:** Cat# MA-0106  
**RESTRICTIONS ON USE:** For laboratory research purposes only. Not for drug or household use.  
**MANUFACTURER:** AkrivisBio, Inc.  
**ADDRESS:** 48511 Warm Springs Blvd., Suite 213, Fremont, CA 94539  
**EMERGENCY PHONE:** 408-739-9315  
**OTHER CALLS:**  
**FAX PHONE:**  
**EMAIL:** [sds@akrivisbio.com](mailto:sds@akrivisbio.com)

**SECTION 2: HAZARDS IDENTIFICATION**

Component	Description	Volume	Safety Information
Cu <sup>2+</sup> Reagent	Proprietary reagent (contains Copper sulfate)	0.2 ml	See below
Assay Diluent	Liquid (contains Bicinchoninic acid, Sodium hydroxide)	10 ml	See below
Protein Mask	Solution	10 ml	No hazards
Trolox Standard	Lyophilized	1 vial	No hazards

**SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS**

Component	CAS Number	EC-No.	Molecular Weight	Chemical Formula	Concentration
Copper sulfate	7758-99-8	231-847-6	249.69	CuO <sub>4</sub> S · 5H <sub>2</sub> O	<5%
Bicinchoninic acid	979-88-4	--	388.29	C <sub>20</sub> H <sub>10</sub> N <sub>2</sub> Na <sub>2</sub> O <sub>4</sub>	<2%
Sodium hydroxide	1310-73-2	215-185-5	40.00	NaOH	<1%

**Copper sulfate:****Emergency Overview**

**GHS Classification:** Acute toxicity, Oral (Category 4), H302  
Serious eye damage (Category 1), H318  
Short-term (acute) aquatic hazard (Category 1), H400  
Long-term (chronic) aquatic hazard (Category 1), H410

**GHS Label elements, including precautionary statements****Pictogram:****Signal word:**

Danger

**Hazard statement(s):**

H302 Harmful if swallowed.  
H318 Causes serious eye damage.  
H410 Very toxic to aquatic life with long lasting effects.

**Precautionary statement(s):**

P264 Wash skin thoroughly after handling.  
P270 Do not eat, drink or smoke when using this product.  
P273 Avoid release to the environment.  
P280 Wear eye protection/ face protection.  
P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.  
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.  
P391 Collect spillage.  
P501 Dispose of contents/ container to an approved waste disposal plant.

**HMIS Classification**

**Health hazard:** 2  
**Chronic health hazard:** \*  
**Flammability:** 0  
**Physical hazards:** 0

**NFPA Rating**

**Health Hazard:** 2  
**Fire:** 0  
**Reactivity Hazard:** 0

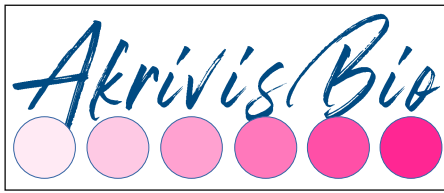
**Potential Health Effects**

**Inhalation:** May be harmful if inhaled. Causes respiratory tract irritation.  
**Skin:** May be harmful if absorbed through skin. Causes skin irritation.  
**Eyes:** Causes eye irritation.  
**Ingestion:** Toxic if swallowed.

**Bicinchoninic acid****Emergency Overview:****OSHA Hazards:** Irritant**GHS Classification**

Skin irritation (Category 2)  
Eye irritation (Category 2A)

**GHS Label elements, including precautionary statements****Pictogram:**



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**Signal word:** Warning  
**Hazard statement(s):** H315 Causes skin irritation.  
H319 Causes serious eye irritation.  
**Precautionary statement(s):** P264 Wash skin thoroughly after handling.  
P280 Wear protective gloves/ eye protection/ face protection.  
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.  
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P321 Specific treatment (see on this label).  
P332 + P313 If skin irritation occurs: Get medical advice/ attention.  
P337 + P313 If eye irritation persists: Get medical advice/ attention.  
P362 Take off contaminated clothing and wash before reuse.

**HMIS Classification**  
**Health hazard:** 2  
**Flammability:** 0  
**Physical hazards:** 0  
**NFPA Rating**  
**Health Hazard:** 2  
**Fire:** 0  
**Reactivity Hazard:** 0

**Sodium hydroxide:**

**Emergency Overview**

**GHS Classification:** Corrosive to metals (Category 1)  
Skin corrosion (Category 1A)  
Serious eye damage (Category 1)  
Acute aquatic toxicity (Category 3)

**GHS Label elements, including precautionary statements**

**Pictogram:**



**Signal word:** Danger  
**Hazard statement(s):** H290 May be corrosive to metals.  
H314 Causes severe skin burns and eye damage.  
H318 Causes serious eye damage.  
H402 Harmful to aquatic life.  
**Precautionary statement(s):** P234 Keep only in original container.  
P264 Wash skin thoroughly after handling.  
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.  
P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.  
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.  
P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor/ physician.  
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/ physician.  
P363 Wash contaminated clothing before reuse.  
P390 Absorb spillage to prevent material damage.  
P405 Store locked up.  
P406 Store in corrosive resistant stainless steel container with a resistant inner liner.  
P501 Dispose of contents/ container to an approved waste disposal plant.

**HMIS Classification**  
**Health hazard:** 3  
**Flammability:** 0  
**Physical hazards:** 1  
**NFPA Rating**  
**Health Hazard:** 3  
**Fire:** 0  
**Reactivity Hazard:** 0

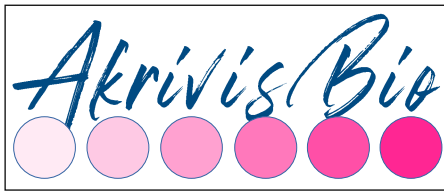
**Potential Health Effects**

**Inhalation:** May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.  
**Skin:** May be harmful if absorbed through skin. Causes skin burns.  
**Eyes:** Causes severe eye burns.  
**Ingestion:** May be harmful if swallowed.

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**SECTION 4: FIRST AID MEASURES**

**General advice** Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.  
**If inhaled** If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.  
**In case of skin contact** Wash off with soap and plenty of water. Consult a physician.



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**In case of eye contact** Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.  
**If swallowed** Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

**SECTION 5: FIRE-FIGHTING MEASURES**

**Copper sulfate:**

Extinguishing media Suitable extinguishing media Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. 5.2 Special hazards arising from the substance or mixture Sulphur oxides, Copper oxides 5.3 Advice for firefighters Wear self-contained breathing apparatus for firefighting if necessary.

**Bicinchoninic acid**

**Suitable extinguishing media:** Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

**Special protective equipment for fire fighters:** Wear self-contained breathing apparatus for firefighting if necessary.

**Hazardous combustion products:** Hazardous decomposition products formed under fire conditions— see section 10.

**Sodium hydroxide**

**Suitable extinguishing media** Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

**Special hazards arising from the substance or mixture** Sodium oxides

**Advice for firefighters** Wear self-contained breathing apparatus for firefighting if necessary.

**Further information** No data available

**SECTION 6: ACCIDENTAL RELEASE MEASURES**

**Personal precautions:** Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.

**Environmental precautions:** Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

**Methods for cleaning up:** Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

**SECTION 7: HANDLING AND STORAGE**

**Precautions for safe handling** Avoid contact with skin and eyes. Avoid inhalation of vapor or mist. Flash back possible over considerable distance. Container explosion may occur under fire conditions. Use explosion-proof equipment. Keep away from sources of ignition – no smoking. Take measures to prevent the buildup of electrostatic charge.

**Conditions for safe storage** Keep container tightly closed in a dry and well-ventilated place. Recommended storage temperature: 4 °C.

**SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**

**Copper sulfate:**

Components	CAS-No.	Value	Control parameters	Basis
Copper sulfate	7758-99-8	TWA	1 mg/m <sup>3</sup>	USA. NIOSH Recommended Exposure Limits

**Bicinchoninic acid**

Contains no substances with occupational exposure limit values.

**Personal protective equipment**

**Respiratory protection**

Respiratory protection is not required. Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN 143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**Hand protection**

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

**Eye protection**

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU).

**Skin and body protection**

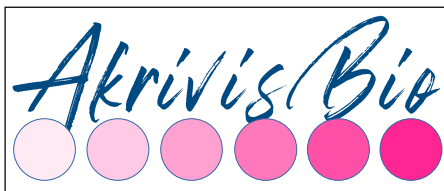
Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific workplace. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

**Hygiene measures**

General industrial hygiene practice.

**Sodium hydroxide**

Components	CAS-No.	Value	Control parameters	Basis
Sodium hydroxide	1310-73-2	TWA	2 mg/m <sup>3</sup>	USA. Occupational Exposure Limits (OSHA) – Table Z-1 – Limits for Air Contaminants
		C	2 mg/m <sup>3</sup>	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Upper Respiratory Tract irritation Eye irritation Skin irritation		
		C	2 mg/m <sup>3</sup>	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Upper Respiratory Tract irritation Eye irritation Skin irritation		



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	C	2 mg/m <sup>3</sup>	USA. NIOSH Recommended Exposure Limits
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**Personal protective equipment**

**Respiratory protection**

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**Hand protection**

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

**Eye protection**

Tightly fitting safety goggles. Face shield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

**Skin and body protection**

Complete suit protecting against chemicals. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

**Hygiene measures**

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

**SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

Property	Copper sulfate	Bicinchoninic acid	Sodium Hydroxide
<b>Appearance:</b>	Solid	White to pale yellow solid	White pellets
<b>pH:</b>	3.5 - 4.5 at 50 g/l at 20 °C	No data available	ca.> 14 at 100 g/l at 20 °C (68 °F)
<b>Water Solubility:</b>	317 g/l at 20 °C	No data available	1,090 g/l at 20 °C (68 °F)
<b>Other Solubility:</b>	No data available	NaHCO <sub>3</sub> , 0.5% (50 mg/ml)	No data available
<b>Boiling Point (°C):</b>	No data available	No data available	No data available
<b>Melting Point (°C):</b>	110 °C	No data available	318 °C (604 °F)
<b>Flash Point (°C):</b>	No data available	No data available	No data available
<b>Ignition Temperature (°C):</b>	No data available	No data available	No data available
<b>Density:</b>	2.284 g/cm <sup>3</sup>	No data available	2.13 g/cm <sup>3</sup> at 20 °C (68 °F)

**SECTION 10: STABILITY AND REACTIVITY**

Property	Copper sulfate	Bicinchoninic acid	Sodium hydroxide
<b>Chemical stability:</b>	Stable under recommended storage conditions		
<b>Conditions to avoid:</b>	Exposure to moisture	No data available	No data available
<b>Materials to avoid:</b>	No data available	Strong oxidizing agents	Strong oxidizing agents, Strong acids, Organic materials
<b>Hazardous decomposition products:</b>	Sulfur oxides, copper oxides	Carbon oxides, nitrogen oxides, sodium oxides	under fire conditions. - Sodium oxides

**SECTION 11: TOXICOLOGICAL INFORMATION**

**Copper sulfate:**

**Acute toxicity:** LD50 Oral - Rat - male and female - 482 mg/kg (OECD Test Guideline 401) LD50 Dermal - Rat - male and female - > 2,000 mg/kg (OECD Test Guideline 402)

**Skin corrosion/irritation:** no data available

**Serious eye damage/eye irritation:** no data available

**Respiratory or skin sensitization:** Prolonged or repeated exposure may cause allergic reactions in certain sensitive individuals.

**Germ cell mutagenicity:** no data available

**Carcinogenicity:**

- IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
- ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
- NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
- OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

**Reproductive toxicity:** no data available

**Teratogenicity:** no data available

**Specific target organ toxicity – single exposure (GHS):** no data available

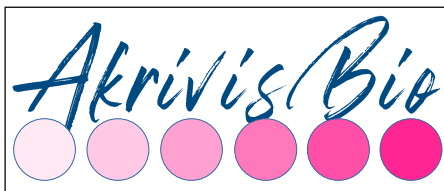
**Specific target organ toxicity – repeated exposure (GHS):** no data available

**Potential Health Effects**

**Inhalation:** May be harmful if inhaled. Causes respiratory tract irritation.

**Skin:** May be harmful if absorbed through skin. Causes skin irritation.

**Eyes:** Causes eye irritation.



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**Ingestion:** Toxic if swallowed.

**Signs and Symptoms of Exposure:** To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

**Additional information:** RTECS: GL8900000

#### **Bicinchoninic acid**

**Acute toxicity:** No data available

**Skin corrosion/irritation:** no data available

**Serious eye damage/eye irritation:** no data available

**Respiratory or skin sensitization:** no data available

**Germ cell mutagenicity:** no data available

#### **Carcinogenicity:**

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

**Reproductive toxicity:** no data available

**Teratogenicity:** no data available

**Specific target organ toxicity – single exposure (GHS):** Inhalation - May cause respiratory irritation.

**Specific target organ toxicity – repeated exposure (GHS):** no data available

**Aspiration hazard:** no data available

**Signs and Symptoms of Exposure:** To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

**Synergistic effects:** no data available

**Additional information:** RTECS: not available

#### **Sodium hydroxide:**

**Acute toxicity:** no data available

**Skin corrosion/irritation:** no data available

**Serious eye damage/eye irritation:** no data available

**Respiratory or skin sensitization:** no data available

**Germ cell mutagenicity:** no data available

#### **Carcinogenicity:**

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

**Reproductive toxicity:** no data available

**Teratogenicity:** no data available

**Specific target organ toxicity – single exposure (GHS):** no data available

**Specific target organ toxicity – repeated exposure (GHS):** no data available

#### **Potential Health Effects**

**Inhalation:** May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.

**Skin:** May be harmful if absorbed through skin. Causes skin burns.

**Eyes:** Causes severe eye burns.

**Ingestion:** May be harmful if swallowed.

**Signs and Symptoms of Exposure:** Exposure may cause a burning sensation, cough, wheezing, laryngitis, shortness of breath, spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema. Material is extremely destructive tissue of the mucous membranes and upper respiratory tract, eyes, and skin.

**Synergistic Effects:** no data available

**Additional information:** RTECS: not available

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., Inhalation of vapors may cause, spasm, inflammation and edema of the bronchi, spasm, inflammation and edema of the larynx, Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting

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## **SECTION 12: ECOLOGICAL INFORMATION**

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#### **Copper sulfate:**

**Persistence and degradability:** no data available

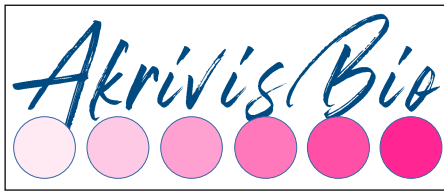
**Bioaccumulative potential:** no data available

**Mobility in soil:** no data available

**PBT and vPvB assessment:** PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

**Other adverse effects:** An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Very toxic to aquatic life.



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**Bicinchoninic acid**

**Persistence and degradability:** no data available  
**Toxicity:** no data available  
**Bioaccumulative potential:** no data available  
**Mobility in soil:** no data available  
**PBT and vPvB assessment:** no data available  
**Other adverse effects:** no data available

**Sodium Hydroxide:**

**Persistence and degradability:** no data available  
**Toxicity:** no data available  
**Bioaccumulative potential:** no data available  
**Mobility in soil:** no data available  
**PBT and vPvB assessment:** no data available  
**Other adverse effects:** An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.  
Harmful to aquatic life

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**SECTION 13: DISPOSAL CONSIDERATIONS**

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**Product:** Observe all federal, state, and local environmental regulations.  
**Contaminated packaging:** Dispose of as unused product.

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**SECTION 14: TRANSPORT INFORMATION**

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**Copper sulfate:**

**DOT (US):** UN-number: 3077, Class: 9, Packing group: III; Proper shipping name: Environmentally hazardous substances, solid, n.o.s. (Copper sulfate); Reportable Quantity (RQ): 10 lbs.; Marine pollutant: Yes; Poison inhalation hazard: No  
**IMDG:** UN-number: 3077, Class: 9, Packing group: III; EMS-No: F-A, S-F; Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S. (Copper sulfate); Marine pollutant: Yes  
**IATA:** UN-number: 3077, Class: 9, Packing group: III; Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Copper sulfate)

**Bicinchoninic acid**

**DOT (US):** Not dangerous goods.  
**IMDG:** Not dangerous goods.  
**IATA:** Not dangerous goods.

**Sodium hydroxide:**

**DOT (US):** UN-Number: 1824, Class: 8, Packing group: II; Proper shipping name: Sodium hydroxide solution; Poison Inhalation Hazard: No  
**IMDG:** UN-Number: 1824, Class: 8, Packing group: II; EMS-No: F-A, S-B; Proper shipping name: SODIUM HYDROXIDE SOLUTION  
**IATA:** UN-Number: 1824, Class: 8, Packing group: II; Proper shipping name: Sodium hydroxide solution

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**SECTION 15: REGULATORY INFORMATION**

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**OSHA Hazards:** Copper sulfate: Target organ effect, Toxic by ingestion, Irritant  
**SARA 302 Components:** SARA 302: No chemical in this material are subject to the reporting requirements of SARA Title III, Section 302  
**SARA 313 Components:** The following components are subject to reporting levels established by SARA Title III, Section 313: Copper sulfate, CAS-No. 7758-99-8; Revision Date: 2007-03-01  
**SARA 311/312 Hazards:** Copper sulfate: Acute Health Hazard, Chronic Health Hazard; Bicinchoninic acid: Acute Health Hazard; Sodium hydroxide: Acute Health Hazard  
**Massachusetts Right To Know Components:** No components are subject to the Massachusetts Right to Know Act.  
**Pennsylvania Right To Know Components:** Copper sulfate, CAS-No. 7758-99-8; Revision Date: 2007-03-01; Bicinchoninic acid: CAS-No. 979-88-4; Sodium hydroxide, CAS-No. 1310-73-2; Revision Date: 2007-03-01  
**New Jersey Right To Know Components:** Copper sulfate, CAS-No. 7758-99-8; Revision Date: 2007-03-01; Bicinchoninic acid: CAS-No. 979-88-4; Sodium hydroxide, CAS-No. 1310-73-2; Revision Date: 2007-03-01  
**California Prop. 65 Components:** This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

**EU regulations:**

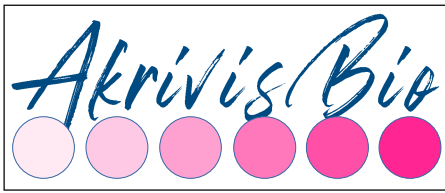
Component	Risk Phrases	Safety Phrases
Copper sulfate	R22, R36/38, R50/53	S22, S60, S61
Bicinchoninic acid	--	--
Sodium hydroxide	R35, R41, R52	S22, S36/37/39, S45, S61

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**SECTION 16: OTHER INFORMATION**

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**DISCLAIMER:** The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. AkrivisBio, Inc., shall not be held liable for any damage



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resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.