Section 1 - PRODUCT AND COMPANY IDENTIFICATION

Material Name
B/OX 324

Alternative Name
Swab On Copper Blackener

Details of the supplier of the product and the safety data sheet

Electrochemical Products Inc.
17000 West Lincoln Ave
New Berlin, WI 53151
Phone: 262-786-9330
Emergency Phone #: NCEC (#EPI-29003) +1 202 464 2554, +44 1865 407333
E-mail: us-sales@epi.com
www.epi.com
Fax: 262-786-9403

PRODUCT SUPPLIED IN AUSTRALIA BY

CASWELL AUSTRALIA P/L
25 BIRCH COURT
WYNDHAM VALE 3024
VICTORIA

PHONE 03 9741 7103 **EMERGENCY NUMBER 000**

Section 2 - HAZARDS IDENTIFICATION

Classification in accordance with paragraph (d) of 29 CFR 1910.1200.
Acute Toxicity - Inhalation - Vapor - Category 3
Skin Corrosion/Irritation - Category 1
Serious Eye Damage/Eye Irritation - Category 1
Hazardous to the Aquatic Environment - Acute - Category 1
Hazardous to the Aquatic Environment - Chronic - Category 1

GHS Label Elements

Symbol(s)

Signal Word
Danger

Hazard Statement(s)
Toxic if inhaled.
Causes severe skin burns and eye damage.
Very toxic to aquatic life with long lasting effects.

Precautionary Statement(s)

Prevention
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.
Wash thoroughly after handling.
Avoid release to the environment.
Do not breathe dusts or mists.

Response
Collect spillage.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.
Wash contaminated clothing before reuse.
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
Immediately call a POISON CENTER or doctor.
Specific treatment (see label).

Storage
Store in a well-ventilated place. Keep container tightly closed.
Store locked up.

Disposal
Dispose of contents/container in accordance with local/regional/national/international regulations.

Statement of Unknown Toxicity
0% of the mixture consists of ingredient(s) of unknown acute toxicity.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

CAS	Component Name	Percent
7732-18-5	Water	70-85
7664-38-2	Phosphoric acid	8.5-11
7446-19-7	Zinc sulphate, monohydrate	2.5-4.5
7758-98-7	Cupric sulfate	2.5-3.5
27546-07-2	Molybdate (Mo2O72-), diammonium	1.8-3.2
7783-00-8	Selenous acid	1-2.5

Section 4 - FIRST AID MEASURES

Inhalation
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Give artificial respiration if not breathing. Never give anything by mouth to a victim who is unconscious or is having convulsions.

Skin
Immediately flush skin with lots of running water for 30 minutes. Remove contaminated clothing and shoes. Wash before reuse. Get immediate medical attention.

Eyes
In case of contact with eyes flush immediately with plenty of flowing water for 10 to 15 minutes holding eyelids apart and consult an ophthalmologist.

Ingestion
If swallowed, give milk or water to dilute. Seek medical attention immediately. Never give anything by mouth to an unconscious person.

Most Important Symptoms/Effects

Acute
Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath headache, nausea, and vomiting. It causes conjunctivitis leading eventually to an allergic type of reaction of the eyes. Acute selenium poisoning produces central nervous system effects, which include nervousness, convulsions, and drowsiness. Other signs of gastrointestinal distress, teeth that are discolored or decayed, odorous (garlic-like) breath, and partial loss of hair and nails. Chronic exposure by inhalation can produce symptoms that include pallor, coating of the tongue, anemia, irritation of the mucosa, lumbar pain, liver and spleen damage, as well as any of the other previously mentioned symptoms.

Note to Physicians
Ingestion will result in metallic taste, garlic odor to breath, nausea.

Section 5 - FIRE FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media
Dry chemical, foam, carbon dioxide, water fog.

Unsuitable Extinguishing Media
None known.

Hazardous Combustion Products
May produce toxic selenous fumes.

Fire Fighting Measures
Firefighters should wear full-face, self-contained breathing apparatus and impervious protective clothing. Firefighters should avoid inhaling any combustion products.

Section 6 - ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures
Isolate area. Keep unnecessary personnel away.

Methods and Materials for Containment and Cleaning Up
Contain the discharged material. Stop source of leak if possible. Block any potential routes to water systems. Ventilate the contaminated area. Absorb spilled product with a commercial oil absorbent, such as sand or earth. Shovel absorbed material into appropriate container for disposal. Wear appropriate protective equipment and clothing during clean-up. Avoid skin contact and inhalation of vapors during disposal of spills. Isolate area. Keep unnecessary personnel away. Follow all Local, State, Federal and Provincial regulations for disposal. Surfaces may become slippery after spillage. Wear appropriate protective equipment and clothing during clean-up.

Environmental Precautions
Do not discharge into sewers or waterways. Incinerate spent absorbent material in an approved incinerator.

Section 7 - HANDLING AND STORAGE

Precautions for Safe Handling
Wash thoroughly after handling.

Conditions for Safe Storage, Including any Incompatibilities
Store in a well-ventilated place. Keep container tightly closed.
Store locked up.
Keep the container tightly closed and in a cool, well-ventilated place.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Exposure Limits

Phosphoric acid	7664-38-2
ACGIH:	1 mg/m3 TWA
	3 mg/m3 STEL
NIOSH:	1 mg/m3 TWA
	3 mg/m3 STEL
	1000 mg/m3 IDLH
Europe:	1 mg/m3 TWA
	2 mg/m3 STEL
OSHA (US):	1 mg/m3 TWA
Mexico:	1 mg/m3 TWA LMPE-PPT
	3 mg/m3 STEL [LMPE-CT]
Molybdate (Mo2O72-), diammonium	27546-07-2
ACGIH:	0.5 mg/m3 TWA as Mo respirable fraction (related to Molybdenum soluble compounds)
NIOSH:	1000 mg/m3 IDLH as Mo (related to Molybdenum soluble compounds)
OSHA (US):	5 mg/m3 TWA as Mo (related to Molybdenum soluble compounds)
Mexico:	5 mg/m3 TWA LMPE-PPT as Mo (related to Molybdenum soluble compounds)
	10 mg/m3 STEL [LMPE-CT] as Mo (related to Molybdenum soluble compounds)
Selenous acid	7783-00-8
ACGIH:	0.2 mg/m3 TWA as Se (related to Selenium compounds)
NIOSH:	0.2 mg/m3 TWA (except Selenium hexafluoride) as Se (related to Selenium compounds)
	1 mg/m3 IDLH as Se (related to Selenium compounds)
OSHA (US):	0.2 mg/m3 TWA as Se (related to Selenium compounds)
Mexico:	0.2 mg/m3 TWA LMPE-PPT as Se (related to Selenium compounds)

EU - Occupational Exposure (98/24/EC) - Binding Biological Limit Values and Health Surveillance Measures

There are no biological limit values for any of this product's components.

ACGIH - Threshold Limit Values - Biological Exposure Indices (BEI)

There are no biological limit values for any of this product's components.

Engineering Controls

Use general ventilation and use local exhaust, where possible, in confined or enclosed spaces.

Individual Protection Measures, such as Personal Protective Equipment

Eye/face protection

Wear safety glasses with side shields or chemical goggles.

Skin Protection

The use of protective coveralls and long sleeved clothing is recommended for prolonged or repeated contact.

Respiratory Protection

If ventilation is not sufficient to effectively prevent buildup of vapor/mist/fume/dust, appropriate NIOSH/MSHA respiratory protection must be provided.

Glove Recommendations

Use of impervious gloves is recommended.

Protective Materials

Eye wash fountain and emergency showers are recommended. Use good industrial hygiene practices in handling this material.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Light Blue Solution	**Physical State**	Liquid
Odor	Characteristic	**Color**	Light Blue Solution
Odor Threshold	Not available	**pH**	0 - 2
Melting Point	Not available	**Boiling Point**	220 °F (105 °C)
Freezing point	32 °F (0 °C)	**Evaporation Rate**	(Approx. equal to Water)
Boiling Point Range	Not available	**Flammability (solid, gas)**	Not available
Autoignition	Not available	**Flash Point**	Not available
Lower Explosive Limit	Not available	**Decomposition**	Not available
Upper Explosive Limit	Not available	**Vapor Pressure**	Not available
Vapor Density (air=1)	(Approx. equal to water)	**Specific Gravity (water=1)**	1.125 - 1.159
Water Solubility	Completely	**Partition coefficient: n-octanol/water**	Not available
Viscosity	Not available	**Solubility (Other)**	Not available
Density	Not available	**VOC**	0

Section 10 - STABILITY AND REACTIVITY

Reactivity
Will not occur.

Chemical Stability
Stable under normal conditions.

Possibility of Hazardous Reactions
Will not occur.

Conditions to Avoid
Avoid contact with extreme heat.

Incompatible Materials
This product may react with strong acids or oxidizing agents, Organic compounds and cyanides.

Hazardous decomposition products
May produce volatile organoselenides or hydrogen selenide.

Section 11 - TOXICOLOGICAL INFORMATION

Acute and Chronic Toxicity

Component Analysis - LD50/LC50
The components of this material have been reviewed in various sources and the following selected endpoints are published:
Water (7732-18-5)
Oral LD50 Rat >90 mL/kg
Phosphoric acid (7664-38-2)
Oral LD50 Rat 1530 mg/kg
Dermal LD50 Rabbit 2740 mg/kg
Inhalation LC50 Rat >850 mg/m3 1 h
Zinc sulphate, monohydrate (7446-19-7)
Oral LD50 Mouse 1891 mg/kg
Cupric sulfate (7758-98-7)
Oral LD50 Rat 300 mg/kg
Dermal LD50 Rabbit 1000 mg/kg

Immediate Effects
No information on significant adverse effects.

Delayed Effects
No information on significant adverse effects.

Irritation/Corrosivity Data
No data available.

Respiratory Sensitization
No data available.

Dermal Sensitization
No data available.

Component Carcinogenicity

Molybdate (Mo2O72-), diammonium	27546-07-2
ACGIH:	A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans (related to Molybdenum soluble compounds)
Selenous acid	7783-00-8
IARC:	Supplement 7 [1987]; Monograph 9 [1975] (related to Selenium compounds) (Group 3 (not classifiable))
DFG:	Category 3B (could be carcinogenic for man) (related to Selenium inorganic compounds)

Germ Cell Mutagenicity
No data available.

Tumorigenic Data
No data available

Reproductive Toxicity
No data available.

Specific Target Organ Toxicity - Single Exposure
No data available.

Specific Target Organ Toxicity - Repeated Exposure
No data available.

Aspiration hazard
No data available.

Medical Conditions Aggravated by Exposure
No data available.

Section 12 - ECOLOGICAL INFORMATION

Component Analysis - Aquatic Toxicity

Zinc sulphate, monohydrate	7446-19-7
Fish:	LC50 96 h Oncorhynchus mykiss 0.162 mg/L [flow-through]; LC50 96 h Oncorhynchus mykiss 0.03 - 0.05 mg/L [semi-static]; LC50 96 h Oncorhynchus mykiss 0.34 - 0.93 mg/L [static]; LC50 96 h Pimephales promelas 0.218 - 0.42 mg/L [flow-through]; LC50 96 h Pimephales promelas 0.06 mg/L [static]; LC50 96 h Pimephales promelas 0.23 - 0.48 mg/L; LC50 96 h Pimephales promelas 0.168 - 0.25 mg/L [semi-static]; LC50 96 h Cyprinus carpio 0.15 mg/L [semi-static]; LC50 96 h Cyprinus carpio 16.85 - 27.18 mg/L [static]; LC50 96 h Lepomis macrochirus 3 - 4.6 mg/L [flow-through]; LC50 96 h Lepomis macrochirus 3.55 - 6.32 mg/L [static]; LC50 96 h Poecilia reticulata 0.63 mg/L; LC50 96 h Poecilia reticulata 49.23 - 64.16 mg/L [semi-static]; LC50 96 h Poecilia reticulata 0.48 - 1.72 mg/L [static] (related to Zinc sulfate)
Algae:	EC50 72 h Pseudokirchneriella subcapitata 0.056 mg/L [static] EPA (related to Zinc sulfate)
Invertebrate:	EC50 48 h Daphnia magna 0.75 mg/L IUCLID; EC50 48 h Daphnia magna 0.538 - 0.908 mg/L [static] EPA (related to Zinc sulfate)
Cupric sulfate	7758-98-7
Fish:	LC50 96 h Oncorhynchus mykiss 0.1 mg/L
Invertebrate:	EC50 48 h Daphnia magna 0.0058 - 0.0073 mg/L [static] EPA

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Methods

Waste must be handled in accordance with all federal, state, provincial, and local regulations. Transport waste material to an authorized waste location, or incinerate under controlled conditions. Avoid disposal. Completely utilize product, if possible. Dispose of unused product in accordance with applicable Federal, State, Provincial, or Local requlations.

Section 14 - TRANSPORT INFORMATION

Component Marine Pollutants

This material contains one or more of the following chemicals required by US DOT to be identified as marine pollutants

Component	CAS #	Minimum Concentration
Cupric sulfate	7758-98-7	DOT regulated severe marine pollutant (anhydrous, hydrates)

US DOT Information:
Shipping Name: Corrosive Liquid N.O.S., (Contains:Phosphoric Acid, Selenous Acid)
Hazard Class: 8
UN/NA #: UN1760
Packing Group: II
Required Label(s): Corrosive

TDG Information:
Shipping Name: Corrosive Liquid N.O.S., (Contains:Phosphoric Acid, Selenous Acid)
Hazard Class: 8
UN#: UN1760
Packing Group: II
Required Label(s): Corrosive

Section 15 - REGULATORY INFORMATION

U.S. Federal Regulations

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), and/or require an OSHA process safety plan.

Phosphoric acid	7664-38-2
CERCLA:	5000 lb final RQ; 2270 kg final RQ
Zinc sulphate, monohydrate	7446-19-7
CERCLA:	1000 lb final RQ; 454 kg final RQ (related to Zinc sulfate)
Cupric sulfate	7758-98-7
CERCLA:	10 lb final RQ; 4.54 kg final RQ
Selenous acid	7783-00-8
SARA 302:	1000 lb lower TPQ; 10000 lb upper TPQ
SARA 313:	1 % de minimis concentration (related to Selenium compounds)
CERCLA:	10 lb final RQ; 4.54 kg final RQ
SARA 304:	10 lb EPCRA RQ

U.S. State Regulations

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA
Phosphoric acid	7664-38-2	Yes	Yes	Yes	Yes	Yes
Zinc sulphate, monohydrate	7446-19-7	Yes	Yes	No	Yes	Yes
Cupric sulfate	7758-98-7	Yes	Yes	No	Yes	Yes
Molybdate (Mo2O72-), diammonium	27546-07-2	Yes	No	Yes	No	No
Selenous acid	7783-00-8	Yes	Yes	Yes	Yes	Yes

Not listed under California Proposition 65

Canada Regulations

This material is a controlled product under Canadian WHMIS regulations.

Canadian WHMIS Ingredient Disclosure List (IDL)

Components of this material have been checked against the Canadian WHMIS Ingredients Disclosure List. The List is composed of chemicals which must be identified on MSDSs if they are included in products which meet WHMIS criteria specified in the Controlled Products Regulations and are present above the threshold limits listed on the IDL

Phosphoric acid	7664-38-2
	1 %
Zinc sulphate, monohydrate	7446-19-7
	1 % (related to Zinc sulfate)
Cupric sulfate	7758-98-7
	1 %
Molybdate (Mo2O72-), diammonium	27546-07-2
	1 % (related to Molybdenum compounds)
Selenous acid	7783-00-8
	1 %

Component Analysis - Inventory

Water (7732-18-5)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR - KECI/KECL	KR - TCCA	CN	NZ	MX
Yes	DSL	EIN	Yes	Yes	No	No	Yes	No	Yes	Yes	Yes

Phosphoric acid (7664-38-2)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR - KECI/KECL	KR - TCCA	CN	NZ	MX
Yes	DSL	EIN	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes

Zinc sulphate, monohydrate (7446-19-7)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR - KECI/KECL	KR - TCCA	CN	NZ	MX
No	DSL	No	Yes	Yes	No	No	No	No	Yes	Yes	No

Cupric sulfate (7758-98-7)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR - KECI/KECL	KR - TCCA	CN	NZ	MX
Yes	DSL	EIN	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes

Molybdate (Mo2O72-), diammonium (27546-07-2)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR - KECI/KECL	KR - TCCA	CN	NZ	MX
Yes	DSL	EIN	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes

Selenous acid (7783-00-8)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR - KECI/KECL	KR - TCCA	CN	NZ	MX
Yes	DSL	EIN	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes

Section 16 - OTHER INFORMATION

HMIS Rating

Health: 2 Fire: 0 Reactivity: 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

Key / Legend
ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability

Act; CLP - Classification, Labelling, and Packaging; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSD - Dangerous Substance Directive; DSL - Domestic Substances List; EEC - European Economic Community; EINECS - European Inventory of Existing Commercial Chemical Substances; ENCS - Japan Existing and New Chemical Substance Inventory; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; ISHL - Japan Industrial Safety and Health Law; JP - Japan; Kow - Octanol/water partition coefficient; KECI - Korea Existing Chemicals Inventory; KECL – Korea Existing Chemicals List; KR - Korea; LEL - Lower Explosive Limit; LLV - Level Limit Value; LOLI - List Of LIsts™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; MX – Mexico; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH - Philippines; RCRA - Resource Conservation and Recovery Act; REACH- Registration, Evaluation, Authorisation, and restriction of Chemicals; RID - European Rail Transport; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TCCA – Korea Toxic Chemicals Control Act,; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TW – Taiwan; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States.

Other Information

Disclaimer:
Reasonable care has been taken in the preparation of this information; however, the manufacturer makes no warranty whatsoever including the warranty of merchantability, expressed or implied, with respect to this information. The manufacturer makes no representations and assumes no liability for any direct, incidental, consequential, or other such damages resulting from its use or misuse..