

SDS DATE: April 25, 2023

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Senescence Detection Kit
PRODUCT CODES: Cat# COS-0102
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

SECTION 2: HAZARDS IDENTIFICATION

Component	Description	Volume	Safety Information
Fixative Solution (1X)	Contains formaldehyde (< 2 %) and glutaraldehyde (< 0.2 %)	125 ml	See below
X-Gal	150 mg	1 vial	No hazards
Staining Solution (1X)	Citrate-based buffer	125 ml	No hazards
Staining Supplement (100X)	Contains potassium ferrocyanide (< 0.5 M)	1.5 ml	See below

Formaldehyde:

Emergency Overview

OSHA Hazards: Target organ effect, Toxic by ingestion, Toxic by skin absorption, Skin and respiratory sensitizer, Corrosive, Carcinogen

Target Organs: Eyes, Kidney, Liver, Heart

GHS Classification: Acute toxicity, Oral (Category 3)
Acute toxicity, Dermal (Category 3)
Serious eye damage (Category 1)
Skin irritation (Category 2)
Respiratory sensitization (Category 1)
Skin sensitization (Category 1)
Carcinogenicity (Category 2)
Acute aquatic toxicity (Category 3)

GHS Label elements, including precautionary statements

Pictogram:



Signal word:

warning

Hazard statement(s):

H302: Harmful if swallowed.
H312: Harmful in contact with skin
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H351 Suspected of causing cancer.
H402 Harmful to aquatic life.

Precautionary statement(s):

P261 Avoid breathing dust/fumes/gas/mist/vapors/spray.
P264 Wash hands thoroughly after handling.
P273 Avoid release to the environment.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P311 Call a POISON CENTER or doctor/physician.

HMIS Classification

Health hazard: 3
Chronic health hazard: *
Flammability: 0
Physical hazards: 0

NFPA Rating

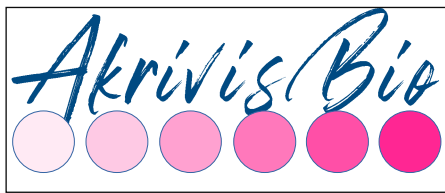
Health Hazard: 3
Fire: 0
Reactivity Hazard: 0

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: Toxic if absorbed through skin. Causes skin burns.
Eyes: Causes eye burns.
Ingestion: Toxic if swallowed.

Glutaraldehyde:

Emergency Overview



SDS DATE: April 25, 2023

OSHA Hazards: Target organ effect, Toxic by ingestion, Toxic by inhalation, Skin sensitizer, Respiratory sensitizer, Corrosive
Target Organs: Central nervous system, Heart

GHS Classification: Acute toxicity, Oral (Category 3)
Acute toxicity, Inhalation (Category 2)
Acute toxicity, Dermal (Category 5)
Serious eye damage (Category 1)
Skin irritation (Category 2)
Respiratory sensitization (Category 1)
Skin sensitization (Category 1)
Acute aquatic toxicity (Category 1)

GHS Label elements, including precautionary statements

Pictogram:



Signal word:

warning

Hazard statement(s):

H302 Harmful if swallowed.
H313 May be harmful in contact with skin.
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H400 very toxic to aquatic life.

Precautionary statement(s):

P260 Do not breathe dust/fumes/gas/mist/vapors/spray.
P264 Wash hands thoroughly after handling.
P273 Avoid release to the environment.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 Immediately call a POISON CENTER or doctor/physician.

HMIS Classification

Health hazard: 3
Chronic health hazard: *
Flammability: 0
Physical hazards: 1

NFPA Rating

Health Hazard: 4
Fire: 0
Reactivity Hazard: 0

Potential Health Effects

Inhalation: Toxic 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 eye burns.
Ingestion: Toxic if swallowed.

Potassium ferrocyanide:

Emergency Overview

OSHA Hazards: Target organ effect

Target Organs: Blood

Other hazards: Contact with acids liberates very toxic gas.

GHS Classification: Not a dangerous substance according to GHS

GHS Label elements, including precautionary statements

Pictogram:



Signal word:

warning

Hazard statement(s):

H412: Harmful to aquatic life with long-lasting effects

Precautionary statement(s): P273: Avoid release to the environment

HMIS Classification

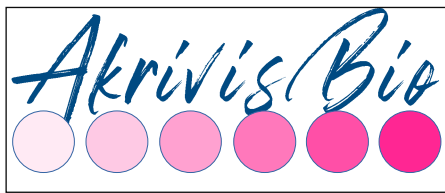
Health hazard: 0
Chronic health hazard: *
Flammability: 0
Physical hazards: 0

NFPA Rating

Health Hazard: 0
Fire: 0
Reactivity Hazard: 0

Potential Health Effects

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



SDS DATE: April 25, 2023

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS Number	EC-No.	Molecular Weight	Chemical Formula
Formaldehyde	50-00-0	200-001-8	30.03	HCHO
Glutaraldehyde	111-30-8	203-856-5	100.12	C ₅ H ₈ O ₂
Potassium ferrocyanide (trihydrate)	14459-95-1	237-722-2	422.39	C ₆ FeK ₄ N ₆ · 3H ₂ O

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. Take victim immediately to hospital. Consult a physician.

In case of eye contact: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during transport to hospital.

If swallowed: Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

SECTION 5: FIRE-FIGHTING MEASURES

Conditions of flammability: Not flammable or combustible.

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

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

Hazardous combustion products: Hazardous combustion products formed under fire conditions – no data available.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions: Wear respiratory protection. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

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: Soak up with inert absorbent material and dispose of as hazardous waste. 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 vapour or mist. Provide appropriate exhaust ventilation at places where dust is formed.

Conditions for safe storage

Keep container tightly closed in a dry and well-ventilated place.

Never allow product to get in contact with water during storage; do not store near acids (Potassium ferrocyanide).

Recommended storage temperature: -20 °C

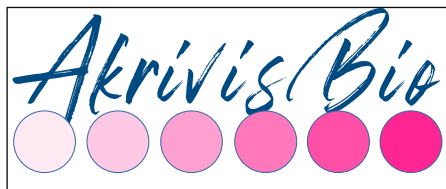
SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Formaldehyde:

Components	CAS-No.	Value	Control parameters	Basis
Formaldehyde	50-00-0	C	0.3 ppm	USA. ACGIH Threshold Limit Values (TLV)
Remarks:	Eye & upper respiratory tract irritation. Suspected human carcinogen. Sensitizer Substance listed, for more information see OSHA document 1910.1048 See 1910.1048			
		TWA	0.016 ppm	USA. NIOSH Recommended Exposure Limits
	Potential occupational carcinogen. See Appendix A, 15 minutes ceiling value.			
		C	0.1 ppm	USA. NIOSH Recommended Exposure Limits
	Potential occupational carcinogen. See Appendix A, 15 minutes ceiling value.			

Glutaraldehyde:

Components	CAS-No.	Value	Control parameters	Basis
Glutaraldehyde	111-30-8	C	0.2 ppm 0.8 mg/m ³	USA. OSHA – TABLE Z-1 Limites for Air Contaminants – 1910.1000
		C	0.2 ppm 0.8 mg/m ³	USA. NIOSH Recommended Exposure Limits
Remarks:	See Appendix C			
		C	0.05 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Eyes & upper respiratory tract irritation. Central nervous system impairment. Skin irritation. Not classifiable as a human carcinogen. Sensitizer.			



SDS DATE: April 25, 2023

Potassium ferrocyanide: Contains no substances with occupational exposure limit values.

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	Formaldehyde	Glutaraldehyde	Potassium Ferrocyanide
Appearance:	Clear liquid	Clear liquid	Light yellow crystalline solid
pH:	No data available	No data available	8.0-10 at 25 °C (77 °F)
Water Solubility:	No data available	Soluble	211 g/l at 20 °C (68 °F)
Other Solubility:	No data available	No data available	No data available
Boiling Point (°C):	No data available	101 °C (214 °F)	No data available
Melting Point (°C):	No data available	No data available	70 °C (158 °F)
Flash Point (°C):	No data available	No data available	No data available
Ignition Temperature (°C):	No data available	No data available	No data available
Density:	No data available	1.143 g/cm ³	1.850 g/cm ³

SECTION 10: STABILITY AND REACTIVITY

Property	Formaldehyde	Glutaraldehyde	Potassium Ferrocyanide
Chemical stability:	Stable under recommended storage conditions		
Conditions to avoid:	No data available	No data available	Temp above 60 °C, direct sunlight, heat
Materials to avoid:	Strong oxidizing agents	Strong bases, strong acids, strong oxidizing agents, alkali metals, acid chlorides, acid anhydrides, reducing agents	Acids, strong oxidizing agents
Hazardous decomposition products:	Carbon oxides	Carbon oxides	Carbon oxides, nitrogen oxides, potassium oxides, iron oxides, hydrogen cyanide

SECTION 11: TOXICOLOGICAL INFORMATION

Formaldehyde:

Acute toxicity: no data available

Skin corrosion/irritation: no data available

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

Respiratory or skin sensitization: no data available

Germ cell mutagenicity: no data available

Carcinogenicity:

IARC: 1 - Group 1: Carcinogenic to humans (Formaldehyde)

NTP: Reasonably anticipated to be a human carcinogen (Formaldehyde)

Reproductive toxicity: no data available

Teratogenicity: no data available

Specific target organ toxicity - single exposure (Globally Harmonized System): no data available

Specific target organ toxicity - repeated exposure (Globally Harmonized System): no data available

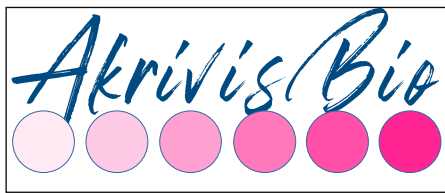
Aspiration hazard: no data available

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: Toxic if absorbed through skin. Causes skin burns.

Eyes: Causes eye burns.



SDS DATE: April 25, 2023

Ingestion: Toxic if swallowed.

Signs and Symptoms of Exposure: Exposure may cause 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 to tissue of the mucous membranes and upper respiratory tract, eyes, and skin.

Glutaraldehyde:

Acute toxicity no data available

Skin corrosion/irritation no data available

Serious eye damage/eye irritation Eyes: no data available

Respiratory or skin sensitization May cause allergic respiratory reaction. May cause allergic skin reaction.

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 (Globally Harmonized System): no data available

Specific target organ toxicity - repeated exposure (Globally Harmonized System): no data available

Aspiration hazard: no data available

Potential Health Effects

Inhalation: Toxic 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 eye burns.

Ingestion: Toxic if swallowed.

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

Potassium Ferrocyanide:

Acute toxicity: LD50 Oral – rat – 3,613 mg/kg

Skin corrosion/irritation: Skin – rabbit – no skin irritation – OECD Test Guideline 404

Serious eye damage/eye irritation: Eyes – rabbit – mild eye irritation – OECD Test Guideline 405

Respiratory or skin sensitization: Guinea pig – did not cause sensitization on laboratory animals

Germ cell mutagenicity: no data available

Carcinogenicity: Did not show carcinogenic effects in animal experiments.

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

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

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

Aspiration hazard: no data available

Inhalation: May be harmful if inhaled. May cause respiratory tract irritation.

Skin: May be harmful if absorbed through skin. May cause skin irritation.

Eyes: May cause eye irritation.

Ingestion: May be harmful if swallowed.

Signs and Symptoms of Exposure: Exposure may cause cyanosis.

SECTION 12: ECOLOGICAL INFORMATION

Formaldehyde:

Persistence and degradability: no data available

Toxicity: no data available

Bioaccumulative potential: no data available

Mobility in soil: no data available

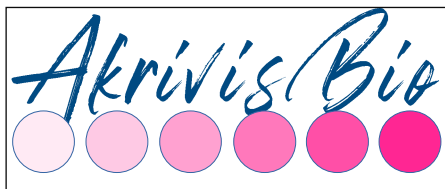
PBT and vPvB assessment: no data available

Other adverse effects: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Harmful to aquatic life.

Glutaraldehyde:

Persistence and degradability: no data available

Toxicity: no data available



SDS DATE: April 25, 2023

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.
Very toxic to aquatic life.

Potassium Ferrocyanide:

Persistence and degradability: Biodegradability→ Result: not readily biodegradable

Toxicity: Toxicity to daphnia and other aquatic invertebrates: EC50 – Daphnia – 32 mg/l – 48 h→ Remarks: anhydrous

Bioaccumulative potential: no data available

Mobility in soil: no data available

PBT and vPvB assessment: no data available

Other adverse effects: no data available

SECTION 13: DISPOSAL CONSIDERATIONS

Product: Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging: Dispose of as unused product.

SECTION 14: TRANSPORT INFORMATION

Formaldehyde:

DOT (US): UN number: 2209, Class: 8, Packing group: III; Proper shipping name: Formaldehyde solutions; Reportable Quantity (RQ): 200 lbs; Marine pollutant: No; Poison Inhalation Hazard: No

IMDG: UN number: 2209, Class: 8, Packing group: III; EMS-No: F-A, S-B; Proper shipping name: FORMALDEHYDE SOLUTION; Marine pollutant: No

IATA: UN number: 2209, Class: 8, Packing group: III; Proper shipping name: Formaldehyde solution

Glutaraldehyde:

DOT (US): UN number: 2922, Class: 8 (6.1), Packing group: II; Proper shipping name: Corrosive liquids, toxic, n.o.s. (Glutaral); Marine pollutant: No; Poison Inhalation Hazard: No

IMDG: UN number: 2922, Class: 8 (6.1), Packing group: II; EMS-No: F-A, S-B; Proper shipping name: CORROSIVE LIQUID, TOXIC, N.O.S. (Glutaral); Marine pollutant: No

IATA: UN number: 2922, Class: 8 (6.1), Packing group: II; Proper shipping name: Corrosive liquid, toxic, n.o.s. (Glutaral)

Potassium Ferrocyanide:

DOT (US): Not dangerous goods.

IMDG: Not dangerous goods.

IATA: Not dangerous goods.

SECTION 15: REGULATORY INFORMATION

Formaldehyde:

OSHA Hazards: Target organ effect, Toxic by ingestion, Toxic by skin absorption, Skin and respiratory sensitizer, Corrosive, Carcinogen

SARA 302 Components: The following components are subject to reporting levels established by SARA Title III, Section 302:

Formaldehyde, CAS-No. 50-00-0; Revision Date: 2007-07-01

SARA 313 Components: The following components are subject to reporting levels established by SARA Title III, Section 313:

Formaldehyde, CAS-No. 50-00-0; Revision Date: 2007-07-01

SARA 311/312 Hazards: Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components: Formaldehyde, CAS-No. 50-00-0; Revision Date: 2007-07-01

Pennsylvania Right To Know Components: Formaldehyde, CAS-No. 50-00-0; Revision Date: 2007-07-01

New Jersey Right To Know Components: Formaldehyde CAS-No. 50-00-0; Revision Date: 2007-07-01

California Prop. 65 Components: WARNING! This product contains a chemical known to the State of California to cause cancer:

Formaldehyde, CAS-No. 50-00-0; Revision Date: 2007-09-28

Glutaraldehyde:

OSHA Hazards: Target organ effect, Toxic by ingestion, Toxic by inhalation, Skin sensitizer, Respiratory sensitizer, Corrosive

SARA 302 Components: SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components: SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards: Acute Health Hazard, Chronic Health Hazard

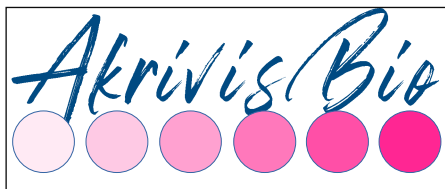
Massachusetts Right To Know Components: Glutaral, CAS-No. 111-30-8; Revision Date: 2007-03-01

Pennsylvania Right To Know Components: Glutaral, CAS-No. 111-30-8; Revision Date: 2007-03-01

New Jersey Right To Know Components: Glutaral, CAS-No. 111-30-8; 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.

Potassium Ferrocyanide:



SDS DATE: April 25, 2023

OSHA Hazards: Target organ effect

SARA 302 Components: SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components: SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards: Chronic Health Hazard

Massachusetts Right To Know Components: No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components: Tetrapotassium hexacyanoferrate, CAS-No. 14459-95-1; Revision Date 1990-01-01

New Jersey Right To Know Components: Tetrapotassium hexacyanoferrate, CAS-No. 14459-95-1; Revision Date 1990-01-01

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
Formaldehyde	R24/25, R35, R40, R42/43	S26, S36/37/39, S45, S51
Glutaraldehyde	R23/25, R35, R42/43	S23, S26, S36/37/39, S45
Potassium Ferrocyanide	R32	S22, S24/25, S26, S36

SECTION 16: OTHER INFORMATION

OTHER INFORMATION:

PREPARATION INFORMATION:

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 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.