## SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT NAME:** Total Collagen Assay Kit  
**PRODUCT CODES:** Cat# K218-100  
**MANUFACTURER:** BioVision, Inc.  
**ADDRESS:** 155 S. Milpitas Blvd. Milpitas, CA 95035  
**EMERGENCY PHONE:** 858-373-8066  
**CHEMTREC PHONE:** 800-424-9300  
**OTHER CALLS:** 408-493-1800  
**FAX PHONE:** 408-493-1801

## SECTION 2: HAZARDS IDENTIFICATION

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Volume</th>
<th>Safety Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxidation Buffer Solution (contains Isopropanol)</td>
<td>10 ml</td>
<td>See below</td>
<td></td>
</tr>
<tr>
<td>Chloramine T Concentrate Solution (contains Chloramine T)</td>
<td>0.6 ml</td>
<td>See below</td>
<td></td>
</tr>
<tr>
<td>Perchloric Acid/Isopropanol Solution</td>
<td>Liquid (contains PCA &amp; Isopropanol)</td>
<td>5 ml</td>
<td>See below</td>
</tr>
<tr>
<td>DMAB Concentrate (in DMSO)</td>
<td>In DMSO</td>
<td>5 ml</td>
<td>See below</td>
</tr>
<tr>
<td>Collagen I Standard (2 mg/ml)</td>
<td>Liquid (1 mg/ml)</td>
<td>0.125 ml</td>
<td>No hazards</td>
</tr>
</tbody>
</table>

### Isopropanol:

**Emergency Overview**

**OSHA Hazards:** Flammable liquid, Target organ effect, Irritant  
**Target Organs:** Nerves, Kidney, Cardiovascular system, Gastrointestinal tract, Liver  

**GHS Classification:**  
- Flammable liquids (Category 2)  
- Skin irritation (Category 3)  
- Eye irritation (Category 2A)  

**GHS Label elements, including precautionary statements**

**Pictogram:**

- Signal word: Danger  
- Hazard statement(s):  
  - H225 Highly flammable liquid and vapour.  
  - H316 Causes mild skin irritation.  
  - H319 Causes serious eye irritation.  
  - H336 May cause drowsiness or dizziness.  

**Precautionary statement(s):**  
- P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.  
- P261 Avoid breathing dust/fumes/gas/mist/vapors/spray.  
- P280 Wear protective gloves/protective clothing/eye protection/face protection.  
- P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

**HMIS Classification**  
- Health hazard: 2  
- Chronic hazard: *  
- Flammability: 3  
- Physical hazards: 0

**NFPA Rating**  
- Health Hazard: 2  
- Fire: 3  
- Reactivity Hazard: 0

**Potential Health Effects**  
- **Inhalation:** May be harmful if inhaled. Causes respiratory tract irritation. Vapors may cause drowsiness or dizziness.  
- **Skin:** May be harmful if absorbed through skin. Causes skin burns.  
- **Eyes:** Causes severe eye burns.  
- **Ingestion:** May be harmful if swallowed.

### Chloramine T:

**Emergency Overview**

**OSHA Hazards:** Target organ effect, Harmful by ingestion, Respiratory sensitizer, Corrosive  
**Target Organs:** Blood, Lungs
MATERIAL SAFETY DATA SHEET
Cat# K218-100 Total Collagen Assay Kit
MSDS DATE: Sep 28, 2015

GHS Classification:
- Acute toxicity, Oral (Category 4)
- Skin corrosion (Category 1B)
- Serious eye damage (Category 1)
- Respiratory sensitization (Category 1)

GHS Label elements, including precautionary statements

Pictogram:

Signal word: Danger
Hazard statement(s):
- H302 Harmful if swallowed.
- H314 Causes severe skin burns and eye damage.
- H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Precautionary statement(s):
- P260 Do not breathe dust or mist.
- P264 Wash skin thoroughly after handling.
- P270 Do not eat, drink or smoke when using this product.
- P280 Wear protective gloves/protective clothing/eye protection/face protection.
- P285 In case of inadequate ventilation wear respiratory protection.
- P301+P330+P331 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
- P303+P361+P353 IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.
- P304+P341 IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.
- 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.
- P363 Wash contaminated clothing before reuse.

HMIS Classification
- Health hazard: 3
- Chronic hazard: *
- Flammability: 1
- Physical hazards: 0

NFPA Rating
- Health Hazard: 3
- Fire: 1
- 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 eye burns.
- Ingestion: Harmful if swallowed.

Perchloric acid:
Emergency Overview
OSHA Hazards: Oxidizer, Harmful by ingestion, Corrosive
GHS Classification:
- Oxidizing liquids (Category 1)
- Acute toxicity, Oral (Category 4)
- Skin corrosion (Category 1A)
- Serious eye damage (Category 1)

GHS Label elements, including precautionary statements

Pictogram:

Signal word: Danger
Hazard statement(s):
- H271 May cause fire or explosion; strong oxidizer.
- H302 Harmful if swallowed.
- H314 Causes severe skin burns and eye damage.

Precautionary statement(s):
- P220 Keep/store away from clothing/combustible materials.
- P280 Wear protective gloves/protective clothing/eye protection/face protection.
- P301+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
- Flammability: 1
- Physical hazards: 3

NFPA Rating
- Health Hazard: 3
- Fire: 1
- Reactivity Hazard: 3
Special Hazard: OX

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: Harmful if absorbed through skin. Causes skin burns.

Eyes: Causes eye burns. Causes severe eye burns.

Ingestion: Harmful if swallowed.

DMSO:

Emergency Overview

OSHA Hazards: Combustible Liquid, Target Organ Effect

Target Organs: Eyes, Skin

GHS Classification: Flammable liquids (Category 4)

GHS Label elements, including precautionary statements

Pictogram: none

Signal word: Warning

Hazard statement(s): H227 Combustible liquid

Precautionary statement(s): none

HMIS Classification

Health hazard: 0

Chronic Health Hazard: *

Flammability: 2

Physical hazards: 0

NFPA Rating

Health hazard: 0

Fire: 2

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.

Aggravated Medical Condition: Avoid contact w/DMSO solutions containing toxic materials or materials with unknown toxicological properties. DMSO is readily absorbed through skin and may carry such materials into the body.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS Number</th>
<th>EC-No.</th>
<th>Molecular Weight</th>
<th>Chemical Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isopropanol</td>
<td>67-63-0</td>
<td>200-661-7</td>
<td>60.10</td>
<td>C₃H₈O</td>
</tr>
<tr>
<td>Chloramine T</td>
<td>7080-50-4</td>
<td>204-854-7</td>
<td>281.69</td>
<td>C₇H₇ClNNaO₂S · 3H₂O</td>
</tr>
<tr>
<td>Perchloric acid (PCA)</td>
<td>7601-90-3</td>
<td>231-512-4</td>
<td>100.46</td>
<td>HClO₄</td>
</tr>
<tr>
<td>DMSO</td>
<td>67-68-5</td>
<td>200-664-3</td>
<td>78.13</td>
<td>C₂H₆OS</td>
</tr>
</tbody>
</table>

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.

In case of eye contact: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed: DO NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

SECTION 5: FIRE-FIGHTING MEASURES

Isopropanol:

Conditions of flammability: Flammable in the presence of a source of ignition when the temperature is above the flash point. Keep away from heat/sparks/open flame/hot surface. No smoking.

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

Special protective equipment for firefighters: Wear self-contained breathing apparatus for firefighting if necessary.

Hazardous combustion products: Hazardous decomposition products formed under fire conditions – carbon oxides.

Further information: Use water spray to cool unopened containers.

DMSO:

Suitable extinguishing media: For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.

Special protective equipment for firefighters: Wear self-contained breathing apparatus for firefighting if necessary.

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

Further information: Use water spray to cool unopened containers.

SECTION 6: ACCIDENTAL RELEASE MEASURES
Personal precautions: Use personal protective equipment. Avoid breathing vapors, mist, gas, or dust. 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: Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapor or mist. 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. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Recommended storage temperature: +4 °C. Moisture sensitive.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Isopropanol:

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-propanol</td>
<td>67-63-0</td>
<td></td>
<td>TWA 200 ppm</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
<tr>
<td>Remarks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STEL 400 ppm</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TWA 400 ppm, 980 mg/m³</td>
<td>USA. Occupational Exposure Limits (OSHA): Table Z-1 Limits for Air Contaminants - 1910.1000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STEL 500 ppm 1,225 mg/m³</td>
<td>USA. Occupational Exposure Limits (OSHA): Table Z-1 Limits for Air Contaminants - 1910.1000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TWA 400 ppm, 980 mg/m³</td>
<td>USA. Occupational Exposure Limits (OSHA): Table Z-1 Limits for Air Contaminants</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The value in mg/ m³ is approximate.

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWA 400 ppm 980 mg/m³</td>
<td>USA. NIOSH Recommended Exposure Limits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ST 500 ppm 1,225 mg/m³</td>
<td>USA. NIOSH Recommended Exposure Limits</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DMSO:

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethyl sulfoxide</td>
<td>67-68-5</td>
<td>TWA 250 ppm</td>
<td>USA. Workplace Environmental Exposure Levels (WEEL)</td>
<td></td>
</tr>
</tbody>
</table>

Chloramine T, Perchloric acid:
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
Face shield and safety glasses. 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

<table>
<thead>
<tr>
<th>Property</th>
<th>Isopropanol</th>
<th>Chloramine T</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance:</strong></td>
<td>Liquid</td>
<td>Off-white powder</td>
</tr>
<tr>
<td><strong>pH:</strong></td>
<td>No data available</td>
<td>8-10 at 50 g/l at 20 °C (68 °F)</td>
</tr>
<tr>
<td><strong>Water Solubility:</strong></td>
<td>Completely soluble</td>
<td>Soluble</td>
</tr>
<tr>
<td><strong>Other Solubility:</strong></td>
<td>No data available</td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Boiling Point (°C):</strong></td>
<td>82 °C (180 °F)</td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Melting Point (°C):</strong></td>
<td>-89.5 °C (-129.1 °F)</td>
<td>167-170 °C (333-338 °F)</td>
</tr>
<tr>
<td><strong>Flash Point (°C):</strong></td>
<td>12 °C (53.6 °F) – closed cup</td>
<td>192 °C (378 °F) – closed cup</td>
</tr>
<tr>
<td><strong>Ignition Temp. (°C):</strong></td>
<td>425 °C (797 °F)</td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Density:</strong></td>
<td>0.785 g/cm³ at 25 °C (77 °F)</td>
<td>No data available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Property</th>
<th>Perchloric acid</th>
<th>DMSO</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance:</strong></td>
<td>Clear liquid</td>
<td>Clear liquid</td>
</tr>
<tr>
<td><strong>pH:</strong></td>
<td>No data available</td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Water Solubility:</strong></td>
<td>No data available</td>
<td>Completely miscible</td>
</tr>
<tr>
<td><strong>Other Solubility:</strong></td>
<td>No data available</td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Boiling Point (°C):</strong></td>
<td>203 °C (397 °F)</td>
<td>189 °C (372 °F)</td>
</tr>
<tr>
<td><strong>Melting Point (°C):</strong></td>
<td>-18 °C (0 °F)</td>
<td>16-19 °C (61-66 °F)</td>
</tr>
<tr>
<td><strong>Flash Point (°C):</strong></td>
<td>113 °C (235 °F) – closed cup</td>
<td>87 °C (189 °F) – closed cup</td>
</tr>
<tr>
<td><strong>Ignition Temp. (°C):</strong></td>
<td>No data available</td>
<td>301 °C (574 °F)</td>
</tr>
<tr>
<td><strong>Density:</strong></td>
<td>1.664 g/cm³ at 25 °C (77 °F)</td>
<td>1.1 g/ml</td>
</tr>
</tbody>
</table>

SECTION 10: STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Property</th>
<th>Isopropanol</th>
<th>Chloramine T</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chemical Stability:</strong></td>
<td>Stable under recommended</td>
<td>Stable under recommended</td>
</tr>
<tr>
<td><strong>Conditions to Avoid:</strong></td>
<td>Heat, flames, sparks, extremes of temperature and direct sunlight</td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Materials to Avoid:</strong></td>
<td>Oxidizing agents, acid anhydrides, aluminum, halogenated compounds, acids</td>
<td>Do not store near acids, strong oxidizing agents, ammonia</td>
</tr>
<tr>
<td><strong>Hazardous decomposition: products:</strong></td>
<td>Carbon oxides</td>
<td>Carbon oxides, nitrogen oxides, sulfur oxides, hydrogen chloride gas, sodium oxides</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Property</th>
<th>Perchloric acid</th>
<th>DMSO</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chemical Stability:</strong></td>
<td>Stable under recommended</td>
<td>Stable under recommended</td>
</tr>
<tr>
<td><strong>Conditions to Avoid:</strong></td>
<td>No data available</td>
<td>Heat, flames, sparks</td>
</tr>
<tr>
<td><strong>Materials to Avoid:</strong></td>
<td>Strong bases, strong acids, amines, phosphorus halides, alcohols, organic materials, powdered metals, strong reducing agents</td>
<td>Acid chlorides, phosphorus halides, strong acids, strong oxidizing agents, strong reducing agents</td>
</tr>
<tr>
<td><strong>Hazardous decomposition: products:</strong></td>
<td>Hydrogen chloride gas</td>
<td>Carbon oxides, sulfur oxides</td>
</tr>
</tbody>
</table>

SECTION 11: TOXICOLOGICAL INFORMATION

**Isopropanol:**

**Acute toxicity:** LD50 Oral – rat – 5,045 mg/kg
LC50 Inhalation – rat – 8 h – 16,000 ppm
LD50 Dermal – rabbit – 12,800 mg/kg
Skin corrosion/irritation: Skin – rabbit- mild skin irritation.
Serious eye damage/eye irritation: Eyes – rabbit – eye irritation – 24 h.
Respiratory or skin sensitization: May cause sensitization by skin contact.
Germ cell mutagenicity: no data available
Carcinogenicity: This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP or EPA classification.
IARC: 3 –Group 3: Not classifiable as to its carcinogenicity to humans (2-propanol).
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

**Perchloric acid:**

**Chemical Stability:** Stable under recommended storage conditions
**Conditions to Avoid:** No data available
**Materials to Avoid:** Strong bases, strong acids, amines, phosphorus halides, alcohols, organic materials, powdered metals, strong reducing agents
**Hazardous decomposition: products:** Hydrogen chloride gas

**DMSO:**

**Chemical Stability:** Stable under recommended storage conditions
**Conditions to Avoid:** Heat, flames, sparks
**Materials to Avoid:** Acid chlorides, phosphorus halides, strong acids, strong oxidizing agents, strong reducing agents
**Hazardous decomposition: products:** Carbon oxides, sulfur oxides
**Chloramine T:**

- **Acute toxicity:** no data available
- **Skin corrosion/irritation:** no data available
- **Serious eye damage/eye irritation:** 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 a 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. May cause drowsiness or dizziness.
- **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:** Central nervous system depression. Prolonged or repeated exposure can cause: nausea, headache, vomiting, narcosis, drowsiness. Overexposure may cause mild, reversible liver effects.

**Additional information:** RTECS: NT8050000

**Perchloric 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):** 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:** Harmful if absorbed through skin. Causes skin burns.
- **Eyes:** Causes eye burns. Causes severe eye burns.

**Signs and Symptoms of Exposure:** Absorption into the body leads to the formation of methemoglobin which in sufficient concentration causes cyanosis. Onset may be delayed 2 to 4 hours or longer. Cough, shortness of breath, headache, nausea, vomiting. Repeated exposure may cause asthma.

**Additional information:** RTECS: not available

**DMSO:**

- **Acute toxicity:** LD50 Oral - rat - 14,500 mg/kg
LC50 Inhalation - rat - 4 h - 40250 ppm
LD50 Dermal - rabbit - > 5,000 mg/kg

Skin corrosion/irritation: no data available
Serious eye damage/eye irritation: no data available
Respiratory/skin sensitization: no data available

Germ cell mutagenicity: Genotoxicity in vitro - mouse – lymphocyte → Cytogenetic analysis
Genotoxicity in vitro - mouse – lymphocyte → Mutation in mammalian somatic cells.
Genotoxicity in vivo - rat – Intraperitoneal → Cytogenetic analysis
Genotoxicity in vivo - mouse – Intraperitoneal → DNA damage


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: Reproductive toxicity – rat → Intraperitoneal → Effects on Fertility: Abortion.
Reproductive toxicity – rat → Intraperitoneal → Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).
Reproductive toxicity – rat → Subcutaneous → Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Effects on Fertility: Litter size (e.g.; # fetuses per litter; measured before birth).
Reproductive toxicity –mouse → Oral → Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea). Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Musculoskeletal system.

Teratogenicity: Developmental Toxicity – mouse → Intraperitoneal → Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Musculoskeletal system.

Signs and Symptoms of Exposure: Exposure via ingestion may cause nausea, fatigue, headache.

Additional Information: RTECS: PV6210000

SECTION 12: ECOLOGICAL INFORMATION

Isopropanol:
Persistence and degradability: no data available
Toxicity: Toxicity to fish: LC50 – Pimephales promelas (fathead minnow) – 9,640 mg/l – 96 h
Toxicity to daphnia and other aquatic invertebrates: EC50 – Daphnia magna (water flea) – 5,102 mg/l – 24 h
Immobilization EC50 – Daphnia magna (water flea) – 6,851 mg/l – 24 h
Toxicity to algae: EC50 – Desmodesmus subsipicus (green algae) – >2,000 mg/l – 72 h
EC50 – algae – >1,000 mg/l – 24 h
Bioaccumulative potential: no data available
Mobility in soil: no data available
PBT and vPvB assessment: no data available
Other adverse effects: no data available

DMSO:
Persistence and degradability: no data available
Toxicity: Toxicity to fish: LC50 – Pimephales promelas (fathead minnow) – 34,000 mg/l – 96 h
LC50 – Oncorhynchus mykiss (rainbow trout) – 35,000 mg/l – 96 h
Toxicity to daphnia and other aquatic invertebrates: EC50 – Daphnia pulex (Water flea) – 27,500 mg/l
Toxicity to algae: EC50 – Lepomis macrochirus (Bluegill) – >400,000 mg/l – 96 h
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 licensed professional waste disposal service to dispose of this material.
Contaminated packaging: Dispose of as unused product.

SECTION 14: TRANSPORT INFORMATION

Isopropanol:
DOT (US): UN-Number: 1219, Class: 3, Packing group: II; Proper shipping name: Isopropanol; Marine pollutant: No; Poison Inhalation Hazard: No
IMDG: UN-Number: 1219, Class: 3, Packing group: II; EMS-No: F-E, S-D; Proper shipping name: ISOPROPANOL; Marine pollutant: No
IATA: UN-Number: 1219, Class: 3, Packing group: II; Proper shipping name: Isopropanol

Chloramine T:
MATERIAL SAFETY DATA SHEET

Cat# K218-100 Total Collagen Assay Kit

DOT (US): UN-Number: 3263, Class: 8, Packing group: III; Proper shipping name: Corrosive solid, basic, organic, n.o.s. (Chloramine T trihydrate); Marine pollutant: No; Poison Inhalation Hazard: No
IMDG: UN-Number: 3263, Class: 8, Packing group: III; EMS-No: F-A, S-B; Proper shipping name: CORROSIVE SOLID, BASIC, ORGANIC, N.O.S. (Chloramine T trihydrate); Marine pollutant: No
IATA: UN-Number: 3263, Class: 8, Packing group: III; Proper shipping name: Corrosive solid, basic, organic, n.o.s. (Chloramine T trihydrate)

Perchloric acid:

DOT (US): UN-Number: 1873, Class: 5.1 (8), Packing group: I; Proper shipping name: Perchloric acid; Marine pollutant: No; Poison Inhalation Hazard: No
IMDG: UN-Number: 1873, Class: 5.1 (8), Packing group: I; EMS-No: F-G, S-Q; Proper shipping name: PERCHLORIC ACID; Marine pollutant: No
IATA: UN-Number: 1873, 5.1 (8), Packing group: I; Proper shipping name: Perchloric acid; IATA Passenger: not permitted for transport

DMSO:

DOT (US): UN-Number: 1993, Class: CBL, Packing group: III; Proper shipping name: Combustible liquid, n.o.s. (Dimethyl sulfoxide); Marine pollutant: No; Poison Inhalation Hazard: No
IMDG: Not dangerous goods.
IATA: Not dangerous goods.

SECTION 15: REGULATORY INFORMATION

OSHA Hazards: Isopropanol: Flammable liquid, Target organ effect, Irritant
Chloramine T: Target organ effect, Harmful by ingestion, Respiratory sensitizer, Corrosive
Perchloric acid: Oxidizer, Harmful by ingestion, Corrosive
DMSO: Combustible liquid, Target organ effect

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:

- 2-propanol, CAS-No. 67-63-0; Revision Date: 1987-01-01
- Chloramine T, CAS-No. 7080-50-4; Revision Date: 1993-04-24
- Dimethyl sulfoxide, CAS-No. 67-68-5; Revision Date: 2007-03-01

Massachusetts Right To Know Components: 2-propanol, CAS-No. 67-63-0; Revision Date: 1987-01-01
Perchloric acid, CAS-No. 7601-90-3; Revision Date: 1993-04-24
Chloramine T, CAS-No. 7080-50-4; Revision Date: 1993-04-24
Dimethyl sulfoxide, CAS-No. 67-68-5; Revision Date: 2007-03-01

New Jersey Right To Know Components: 2-propanol, CAS-No. 67-63-0; Revision Date: 1987-01-01
Chloramine T, CAS-No. 7080-50-4; Revision Date: 1993-04-24
Dimethyl sulfoxide, CAS-No. 67-68-5; 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:

<table>
<thead>
<tr>
<th>Component</th>
<th>Risk Phrases</th>
<th>Safety Phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isopropanol</td>
<td>R11, R36, R67</td>
<td>S7, S16, S24/25, S26</td>
</tr>
<tr>
<td>Chloramine T</td>
<td>R22, R31, R34, R42</td>
<td>S7, S22, S26, S36/37/39, S45</td>
</tr>
<tr>
<td>Perchloric acid</td>
<td>R5, R8, R35</td>
<td>S23, S26, S36, S45</td>
</tr>
<tr>
<td>DMSO</td>
<td>R10, R36/37/38</td>
<td>S24/25, S36/37/39, S45</td>
</tr>
</tbody>
</table>

SECTION 16: OTHER 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. BioVision, 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.