SAFETY DATA SHEET
Cat# K620-100, Ethanol Assay Kit
SDS DATE: 14MAY2015

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Ethanol Assay Kit
PRODUCT CODES: Cat# K620-100
MANUFACTURER: BioVision, Inc.
DIVISION:
ADDRESS: 155 S. Milpitas Blvd. Milpitas, CA 95035
EMERGENCY PHONE: 858-373-8066
CHEMTREC PHONE: 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>Ethanol Assay Buffer</td>
<td>Proprietary Buffer</td>
<td>25 ml</td>
<td>No hazards</td>
</tr>
<tr>
<td>Ethanol Probe</td>
<td>In DMSO</td>
<td>0.4 ml</td>
<td>See below</td>
</tr>
<tr>
<td>Ethanol Enzyme Mix</td>
<td>Lyophilized</td>
<td>100 ug</td>
<td>No hazards</td>
</tr>
<tr>
<td>Ethanol Standard</td>
<td>contains Ethanol</td>
<td>1 mg</td>
<td>See below</td>
</tr>
</tbody>
</table>

**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.

**Ethanol:**

Emergency Overview
OSHA Hazards: Highly flammable liquid, Target organ effect, Irritant, Carcinogen
Target Organs: Nerves, Liver, Heart
GHS Classification: Flammable liquids (Category 2)
Skin irritation (Category 2)
Eye irritation (Category 2B)
Specific target organ toxicity – single exposure (Category 3)
GHS Label elements, including precautionary statements
Pictogram: 

Signal word: Danger
Hazard statement(s): H225 Highly flammable liquid and vapor
H315+H320 Causes skin and eye irritation.
H335 May cause respiratory irritation.
Precautionary statement(s): P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P261 Avoid breathing dust/fume/gas/mist/vapors/spray.
SAFETY DATA SHEET
Cat# K620-100, Ethanol Assay Kit  
SDS DATE: 14MAY2015
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 health 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.
Skin: May be harmful if absorbed through skin. Causes skin irritation.
Eyes: Causes eye irritation.
Ingestion: May be harmful if swallowed.

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>DMSO</td>
<td>67-68-5</td>
<td>200-664-3</td>
<td>78.13</td>
<td>C₂H₆OS</td>
</tr>
<tr>
<td>Ethanol</td>
<td>64-17-5</td>
<td>200-578-6</td>
<td>46.07</td>
<td>C₂H₆O</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

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

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions: Use personal protective equipment. 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: 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. Use explosion-proof equipment. Keep away from sources of ignition (no smoking). Take measures to prevent the buildup of electrostatic charge.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

<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</td>
<td>250 ppm</td>
<td>USA. Workplace Environmental Exposure Levels (WEEL)</td>
</tr>
<tr>
<td>Ethanol</td>
<td>64-17-5</td>
<td>TWA</td>
<td>1,000 ppm</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
</tbody>
</table>
SAFETY DATA SHEET
Cat# K620-100, Ethanol Assay Kit                     SDS DATE: 14MAY2015

Remarks: Upper respiratory tract irritation. Confirmed animal carcinogen with unknown relevance to humans.

<table>
<thead>
<tr>
<th>Property</th>
<th>DMSO</th>
<th>Ethanol</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>Completely miscible</td>
<td>Completely soluble</td>
</tr>
<tr>
<td><strong>Other Solubility:</strong></td>
<td>No data available</td>
<td>78-80 °C (172.4-176 °F)</td>
</tr>
<tr>
<td><strong>Boiling Point (°C):</strong></td>
<td>189 °C (372 °F)</td>
<td>-144 °C (-227.2 °F)</td>
</tr>
<tr>
<td><strong>Melting Point (°C):</strong></td>
<td>16-19 °C (61-66 °F)</td>
<td>14 °C (57.2 °F)</td>
</tr>
<tr>
<td><strong>Flash Point (°C):</strong></td>
<td>87 °C (189 °F)</td>
<td>363 °C (685 °F)</td>
</tr>
<tr>
<td><strong>Ignition Temp. (°C):</strong></td>
<td>301 °C (574 °F)</td>
<td>0.79 g/cm³</td>
</tr>
<tr>
<td><strong>Density:</strong></td>
<td>1.1 g/ml</td>
<td></td>
</tr>
</tbody>
</table>

SECTION 10: STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Property</th>
<th>DMSO</th>
<th>Ethanol</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chemical Stability:</strong></td>
<td>Stable under recommended storage conditions</td>
<td></td>
</tr>
<tr>
<td><strong>Conditions to Avoid:</strong></td>
<td>Heat, flames, sparks</td>
<td>Heat, flames, sparks, direct sunlight</td>
</tr>
<tr>
<td><strong>Materials to Avoid:</strong></td>
<td>Acid chlorides, phosphorus halides, strong acids, strong oxidizing agents, strong reducing agents</td>
<td>Alkali metals, ammonia, oxidizing agents, peroxides</td>
</tr>
<tr>
<td><strong>Hazardous decomposition: products:</strong></td>
<td>Carbon oxides, sulfur oxides</td>
<td>Carbon oxides</td>
</tr>
</tbody>
</table>

SECTION 11: TOXICOLOGICAL INFORMATION

**DMSO:**
- **Acute toxicity:** LD50 Oral - rat - 14,500 mg/kg
- **LC50 Inhalation - rat - 4 h - 40250 ppm**
- **LD50 Dermal - rat - > 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**
SAFETY DATA SHEET
Cat# K620-100, Ethanol Assay Kit

Carcinogenicity: Carcinogenicity – rat → Oral: Possible Tumorogenic: Equivocal tumorogenic agent by RTECS criteria. Skin & Appendages: Other: Tumors.

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 – 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.

Additional Information: RTECS: PV621000

Ethanol:
Acute toxicity: LD50 Oral – rat → 7,060 mg/kg → Remarks: Lungs, thorax, or respiration: other changes
LC50 Inhalation – rat → 10 h → 20000 ppm
Skin corrosion/irritation: Skin – rabbit – irritating to skin – 24 h
Serious eye damage/eye irritation: Eyes – rabbit – mild eye irritation – 24 h (Draize test)
Respiratory or skin sensitization: no data available
Germ cell mutagenicity: no data available
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 – human → female – oral: Effects on newborn: apgar score (human only), other neonatal measures or effects, and drug dependence.
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
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: May be harmful if swallowed.

Signs and Symptoms of Exposure: Exposure may cause central nervous system depression, narcosis, and/or damage to the heart. 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: KG6300000

SECTION 12: ECOLOGICAL INFORMATION

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: Observe all federal, state, and local environmental regulations.
SECTION 14: TRANSPORT INFORMATION

**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

**Ethanol:**
- DOT (US): UN-number: 1170  
- Class: 3  
- Packing group: II  
- Proper shipping name: Ethanol  
- Marine pollutant: No  
- Poison Inhalation hazard: No  
- IMDG: UN-number: 1170  
- Class: 3  
- Packing group: II  
- EMS-No: F-E, S-D  
- IATA: UN-number: 1170  
- Class: 3  
- Packing group: II

SECTION 15: REGULATORY INFORMATION

**OSHA Hazards:** Ethanol: Highly flammable liquid, Target organ effect, Irritant, Carcinogen  
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:** 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 II, Section 313.  
**SARA 311/312 Hazards:** Ethanol: Fire Hazard, Acute Health Hazard, Chronic Health Hazard  
DMSO: Fire Hazard, Chronic Health Hazard

**Massachusetts Right To Know Components:** Ethanol, CAS-No. 64-17-5, Revision Date: 2007-03-01  
Dimethyl sulfoxide CAS-No. 67-68-5; Revision Date: 2007-03-01

**Pennsylvania Right To Know Components:** Ethanol, CAS-No. 64-17-5, Revision Date: 2007-03-01  
Dimethyl sulfoxide CAS-No. 67-68-5; Revision Date: 2007-03-01

**New Jersey Right To Know Components:** Ethanol, CAS-No. 64-17-5, Revision Date: 2007-03-01  
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>Ethanol</td>
<td>R11, R20/21/22</td>
<td>S16, S36/37/39, 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:

**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. 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.