SAFETY DATA SHEET
Cat# K337-100, NAD/NADH Quantification Kit

SDS DATE: 17APR2015

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: NAD/NADH Quantification Kit

PRODUCT CODES: Cat# K337-100

MANUFACTURER: BioVision, Inc.

DIVISION:

ADDRESS: 155 South 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>NAD/NAD Extraction Buffer</td>
<td>Proprietary Buffer</td>
<td>50 ml</td>
<td>No hazards</td>
</tr>
<tr>
<td>NAD Cycling Buffer</td>
<td>Proprietary Buffer (contains ethanol)</td>
<td>15 ml</td>
<td>See below</td>
</tr>
<tr>
<td>NAD Cycling Enzyme Mix</td>
<td>Lyophilized</td>
<td>1 vial</td>
<td>No hazards</td>
</tr>
<tr>
<td>NADH Developer</td>
<td>Lyophilized</td>
<td>1 vial</td>
<td>No hazards</td>
</tr>
<tr>
<td>Stop Solution</td>
<td>Liquid (contains SDS)</td>
<td>1.2 ml</td>
<td>See below</td>
</tr>
<tr>
<td>NADH Standard (MW: 763)</td>
<td>Lyophilized</td>
<td>152.6 µg</td>
<td>No hazards</td>
</tr>
</tbody>
</table>

Ethanol:
Emergency Overview
OSHA Hazards: Combustible liquid, Target organ effect, Irritant, Carcinogen
Target Organs: Nerves, Liver, Heart
GHS Classification:
- Flammable liquids (Category 3)
- Skin irritation (Category 2)
- Eye irritation (Category 2B)
- Specific target organ toxicity – single exposure (Category 3)
GHS Label elements, including precautionary statements
- Pictogram: none
- Signal word: warning
- Hazard statement(s): H226: combustible liquid
- Precautionary statement(s): P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
  - P261 Avoid breathing dust/fume/gas/mist/vapors/spray.
  - 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: 2
- Physical hazards: 0

NFPA Rating
- Health Hazard: 2
- Fire: 2
- 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.

SDS:
OSHA Hazards: Target organ effect, Irritant, Harmful by ingestion, Toxic by skin absorption
Target Organs: Lungs
GHS Classification:
- Acute toxicity, Oral (Category 4)
- Acute toxicity, Dermal (Category 3)
- Skin irritation (Category 2)
- Eye irritation (Category 2B)
- Specific target organ toxicity – single exposure (Category 3)
GHS Label elements, including precautionary statements
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Hazard statement(s):
- H315 - Causes skin irritation
- H319 - Causes serious eye irritation
- H335 - May cause respiratory irritation

Precautionary statement(s):
- P261  Avoid breathing dust/fumes/gas/mist/vapors/spray.
- P301+P312  IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
- P302+P352  IF ON SKIN: Wash with plenty of soap and water.
- P304+P340  IF INHALED: 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.
- P330  Rinse mouth.
- P405  Store locked up.

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: Toxic if absorbed through skin. Causes skin irritation.
- Eyes: Causes eye irritation.
- Ingestion: 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>Ethanol</td>
<td>64-17-5</td>
<td>200-578-6</td>
<td>46.07</td>
<td>C2H6O</td>
</tr>
<tr>
<td>Sodium dodecyl sulfate (SDS)</td>
<td>151-21-3</td>
<td>205-788-1</td>
<td>288.38</td>
<td>C12H25O4 SNa</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: Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

SECTION 5: FIRE-FIGHTING MEASURES

Ethanol:
- 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.
- 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.

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.
- 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 formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed. Normal measures for preventive fire protection.
- Conditions for safe storage
- Keep container tightly closed in a dry and well-ventilated place.
- Recommended storage temperature: -20 °C.
## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

**Ethanol:**

<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>Ethanol</td>
<td>64-17-5</td>
<td></td>
<td>TWA 1,000 ppm</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
</tbody>
</table>

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

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<thead>
<tr>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWA 1,000 ppm</td>
<td>USA. OSHA: TABLE Z-1 Limits for Air Contaminants – 1910.1000</td>
<td></td>
</tr>
<tr>
<td>TWA 1,000 ppm</td>
<td>USA. Occupational Exposure Limits (OSHA): Table Z-1 Limits for Air Contaminants</td>
<td></td>
</tr>
</tbody>
</table>

The value in mg/m³ is approximate.

Nicotinamide, Sodium carbonate, Triton X-100, EDTA, PMS, & SDS:

Contain 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

### Property | Ethanol | SDS
---|---|---
**Appearance:** | Clear liquid | Liquid |
**pH:** | No data available | No data available |
**Water Solubility:** | Completely soluble | No data available |
**Other Solubility:** | No data available | No data available |
**Boiling Point (°C):** | 78-80 °C (172.4-176 °F) | No data available |
**Melting Point (°C):** | -144 °C (-227.2 °F) | No data available |
**Flash Point (°C):** | 14 °C (57.2 °F) | No data available |
**Ignition Temperature (°C):** | 363 °C (685°F) | No data available |
**Density:** | 0.79 g/cm³ | 1.010 g/cm³ |

## SECTION 10: STABILITY AND REACTIVITY

### Property | Ethanol | SDS
---|---|---
**Chemical stability:** | Stable under recommended storage conditions | |
**Conditions to avoid:** | Heat, flames, sparks, direct sunlight | No data available |
**Materials to avoid:** | Alkali metals, ammonia, oxidizing agents, peroxides | Strong oxidizing agents |
**Hazardous decomposition products:** | Carbon oxides | Carbon oxides, sulfur oxides, sodium oxides |

## SECTION 11: TOXICOLOGICAL INFORMATION

**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)
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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: KQ6300000

SDS:
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

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

Signs and Symptoms of Exposure: The sodium salt of dodecyl sulfate has been reported to cause pulmonary sensitization resulting in hyperreactive airway dysfunction and pulmonary allergy accompanied by fatigue, malaise, and aching. Significant symptoms of exposure can persist for more than two years and can be activated by a variety of nonspecific environmental stimuli such as automobile exhaust, perfumes, and passive smoking. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.
Additional information: RTECS: not available

SECTION 12: ECOLOGICAL INFORMATION
SDS Solution (10% in H2O):
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.

SECTION 13: DISPOSAL CONSIDERATIONS
Product: Observe all federal, state, and local environmental regulations. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging: Dispose of as unused product.

SECTION 14: TRANSPORT INFORMATION

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; Proper shipping name: ETHANOL; Marine pollutant: No
IATA: UN-number: 1170, Class: 3, Packing group: II; Proper shipping name: Ethanol

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

SECTION 15: REGULATORY INFORMATION

OSHA Hazards: Ethanol: Highly flammable liquid, Target organ effect, Irritant, Carcinogen
SDS: Target organ effect, Irritant, Harmful by ingestion, Toxic by skin absorption
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 III, Section 313.
SARA 311/312 Hazards: SDS: Acute Health Hazard, Chronic Health Hazard
Ethanol: Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components: Ethanol, CAS-No. 64-17-5, Revision Date: 2007-03-01

Pennsylvania Right To Know Components: Ethanol, CAS-No. 64-17-5, Revision Date: 2007-03-01
Sodium dodecyl sulfate, CAS-No. 151-21-3

New Jersey Right To Know Components: Ethanol, CAS-No. 64-17-5, Revision Date: 2007-03-01
Sodium dodecyl sulfate, CAS-No. 151-21-3

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>SDS</td>
<td>R22, R24, R36/37/38</td>
<td>S24/25, S36/37/39</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.