SAFETY DATA SHEET

Cat# K205-100 Nitric Oxide Synthase Activity Kit (Colorimetric) **SDS DATE: Jun 16, 2015**

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: **Nitric Oxide Synthase Activity Kit (Colorimetric)**

PRODUCT CODES: **Cat# K205-100**

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

Component	Description	Amount	Safety Information
NOS Assay Buffer	Liquid	25 ml	No hazards
NOS Dilution Buffer	Liquid	1.5 ml	No hazards
NOS Substrate	Liquid	0.5 ml	No hazards
NOS Cofactor 1	Lyophilized	1 Vial	No hazards
NOS Cofactor 2 (25X)	Liquid	0.1 ml	No hazards
Nitrate Reductase	Lyophilized	1 Vial	No hazards
NOS (Positive Control)	Liquid	4 µl	No hazards
Enhancer	Lyophilized	1 Vial	No hazards
Nitrite Standard	contains Sodium nitrite	1 Vial	See below
Griess Reagent 1	Solution (contains phosphoric acid)	10 ml	See below
Griess Reagent 2	Solution (contains NED)	10 ml	See below

Sodium nitrite:
Emergency Overview
OSHA Hazards: Oxidizer, Carcinogen, Target organ effect, Toxic by ingestion, Irritant
Target Organs: Blood, Cardiovascular system, Smooth muscle
GHS Classification: Oxidizing solids (Category 3)
Acute toxicity, Oral (Category 3)
Eye irritation (Category 2A)
Acute aquatic toxicity (Category 1)
GHS Label elements, including precautionary statements
Pictogram:

Signal word: Danger
Hazard statement(s): H272 May intensify fire; oxidizer.
H301 Toxic if swallowed.
H319 Causes serious eye irritation.
H350: May cause cancer
H400 Very toxic to aquatic life..
Precautionary statement(s): P220 Keep/store away from clothing/combustible materials.
P273 Avoid release to the environment.
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.
HMIS Classification
Health hazard: 2
Chronic health hazard: *
Flammability: 0
Physical hazards: 1

NFPA Rating
- **Health Hazard:** 2
- **Fire**: 0
- **Reactivity Hazard**: 1
- **Special Hazard**: OX

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:** Toxic if swallowed.

Phosphoric acid:

Emergency Overview

OSHA Hazards: Target organ effect, Highly toxic by inhalation, Harmful by ingestion, Corrosive

Target Organs: Liver, Blood, Bone marrow

GHS Classification:
Acute toxicity, Oral (Category 4)
Acute toxicity, Inhalation (Category 2)
Acute toxicity, Dermal (Category 5)
Skin corrosion (Category 1B)
Serious eye damage (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
H319: Causes serious eye irritation
H335: May cause respiratory irritation

Precautionary statement(s):
P260 Do not breathe dust/fumes/gas/mist/vapors/spray.
P280 Wear protective gloves/eye protection/face protection.
P284 Wear respiratory protection.
P301+P312 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+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.
P310 Immediately 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 fatal 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.
- **Ingestion:** Harmful if swallowed.

NED:

Emergency Overview

OSHA Hazards: Irritant

GHS Classification:
Skin irritation (Category 2)
Eye irritation (Category 2A)
Specific target organ toxicity – single exposure (Category 3)

GHS Label elements, including precautionary statements

Pictogram:

Signal word: Warning

Hazard statement(s):
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.

Precautionary statement(s): P261 Avoid breathing dust/fume/gas/mist/vapors/spray.

P264 Wash skin thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/eye protection/face protection.
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.
P312 Call a POISON CENTER or doctor/physician if you feel unwell.
P332+P313 If skin irritatation occurs: Get medical advice/attention.
P337+P313 If eye irritation persists: Get medical advice/attention.

HMIS Classification
- **Health hazard**: 2
- **Flammability**: 0
- **Physical hazards**: 1

NFPA Rating
- **Health Hazard:** 2
- **Fire**: 0
- **Reactivity Hazard**: 1

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

Component	CAS Number	EC-No.	Molecular Weight	Chemical Formula
Sodium nitrite	7632-00-00	231-555-9	69.00	$NNaO_2$
Phosphoric acid	7664-38-2	231-633-2	98.00	H_3PO_4
N-(1-Naphthyl)ethylenediamine dihydrochloride (NED)	1465-25-4	215-981-2	259.17	$C_{12}H_{14}N_2 \cdot 2HCl$

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

Condition of flammability: Not flammable or combustible.
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.
Further information: Use water spray to cool unopened containers.

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 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

Phosphoric acid:

Components	CAS-No.	Value	Control parameters	Basis
Phosphoric acid	7664-38-2	TWA	1 mg/m^3	USA. ACGIH Threshold Limit Values (TLV)
Remarks:	Eye, skin, & upper respiratory tract irritation.			
		STEL	3ppm	USA. ACGIH Threshold Limit Values (TLV)
	Eye, skin, & upper respiratory tract irritation.			
		TWA	1 mg/m^3	USA. Occupational Exposure Limits (OSHA) – Table Z-1: Limits for Air Contaminants
		TWA	1 mg/m^3	USA. OSHA – Table Z-1: Limits for Air Contaminants – 1910.1000
		STEL	3 mg/m^3	USA. OSHA – Table Z-1: Limits for Air Contaminants – 1910.1000
		TWA	1 mg/m^3	USA. NIOSH Recommended Exposure Limits
		ST	3 mg/m^3	USA. NIOSH Recommended Exposure Limits

Sodium nitrite, & NED:
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

Property	Sodium nitrite	Phosphoric acid	NED
Appearance:	Solid	White crystalline	Solid
pH:	9	No data available	13-14
Water Solubility:	820 g/l at 20 ^{o}C (68 ^{o}F)	No data available	No data available
Other Solubility:	No data available	No data available	No data available
Boiling Point (°C):	320 ^{o}C (608 ^{o}F)	158 ^{o}C (316 ^{o}F)	No data available
Melting Point (°C):	271 ^{o}C (520 ^{o}F)	41-44 ^{o}C (106-111 ^{o}F)	194-198 ^{o}C (381-388 ^{o}F)
Flash Point (°C):	No data available	No data available	No data available
Ignition Temp. (°C):	No data available	No data available	No data available
Density:	2.168 g/cm^3	1.685 g/ml	No data available

SECTION 10: STABILITY AND REACTIVITY

Property	Sodium nitrite	Phosphoric acid	NED
Chemical stability:	Stable under recommended storage conditions		
Conditions to avoid:	Exposure to moisture	No data available	Exposure to moisture
Materials to avoid:	Acids, powdered metals, ammonia, cyanides, amines, activated carbon	Strong bases, powdered metals	Acids, acid chlorides, acid anhydrides, oxidizing agents
Hazardous decomposition products:	Nitrogen oxides, sodium oxides	Oxides of phosphorus	Carbon oxides, nitrogen oxides, hydrogen chloride gas

SECTION 11: TOXICOLOGICAL INFORMATION

Sodium nitrite:
Acute toxicity: LD50 Oral – rat – 157.9 mg/kg
LD50 Oral – mouse – 175 mg/kg→ Remarks: Vascular: BP lowering not characterized in autonomic section. Vascular: Regional or general arteriolar or venous dilation.
Skin corrosion/irritation: Skin – rabbit – no skin irritation – 48 h – OECD Test Guideline 404
Serious eye damage/eye irritation: Eyes – rabbit – moderate eye irritation – 24 h – OECD Test Guideline 405

Respiratory or skin sensitization: no data available
Germ cell mutagenicity: no data available
Carcinogenicity: Limited evidence of carcinogenicity in animal studies.

IARC:	2A – Group 2A: Probably carcinogenic to humans (Sodium nitrite).
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
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: Toxic if swallowed.
Signs and Symptoms of Exposure: To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.
Additional information: RTECS: RA1225000

Phosphoric acid:
Acute toxicity: LD50 Dermal – rabbit – 2,740 mg/kg→ Remarks: Behavioral: Somnolence (general depressed activity). Behavioral: Excitement.
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
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 fatal 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.
Ingestion: Harmful if swallowed.
Signs and Symptoms of Exposure: Exposure may cause a burning sensation, cough, wheezing, laryngitis, shortness of breath, headache, nausea, vomiting, and/or cyanosis.
Additional information: RTECS: TB6300000

NED:
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
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: To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.
Additional information: RTECS: KV5330000

SECTION 12: ECOLOGICAL INFORMATION

Sodium nitrite:
Persistence and degradability: no data available
Toxicity: Toxicity to fish: flow-through test LC50 – Oncorhynchus mykiss (rainbow trout) – 0.94-1.92 mg/l – 96.0 h
Mortality NOEC – Oncorhynchus mykiss (rainbow trout) – 0.54 mg/l – 96.0 h
Toxicity to daphnia and other aquatic invertebrates: EC50 – Daphnia magna (Water flea) – 12.5 mg/l – 48 h
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.

Phosphoric acid:
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: May be harmful to aquatic organisms due to the shift of the pH.

SECTION 13: DISPOSAL CONSIDERATIONS

Product: Observe all federal, state, and local environmental regulations.
Contaminated packaging: Dispose of as unused product.

SECTION 14: TRANSPORT INFORMATION

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

Sodium nitrite:
DOT (US): UN-number: 1500, Class: 5.1(6.1), Packing group: III; Proper shipping name: Sodium nitrite; Reportable Quantity (RQ): 100 lbs.; Marine pollutant: No; Poison Inhalation Hazard: No
IMDG: UN-number: 1500, Class: 5.1(6.1), Packing group: III; EMS-No: F-A, S-Q; Proper shipping name: SODIUM NITRITE; Marine pollutant: No
IATA: UN-number: 1500, Class: 5.1(6.1), Packing group: III; Proper shipping name: Sodium nitrite

Phosphoric acid:
DOT (US): UN-number: 1805, Class: 8, Packing group: III; Proper shipping name: Phosphoric acid solution; Marine pollutant: No; Poison Inhalation Hazard: No
IMDG: UN-number: 1805, Class: 8, Packing group: III; EMS-No: F-A, S-B; Proper shipping name: Phosphoric acid solution; Marine pollutant: No
IATA: UN-number: 1805, Class: 8, Packing group: III; Proper shipping name: Phosphoric acid solution

SECTION 15: REGULATORY INFORMATION

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: The following components are subject to reporting levels established by SARA Title III, Section 313:
Sodium nitrite, CAS-No. 7632-00-0; Revision Date: 2007-07-01
SARA 311/312 Hazards: NED: Acute Health Hazard
Sodium nitrite: Reactivity Hazard, Acute Health Hazard, Chronic Health Hazard
Phosphoric acid: Acute Health Hazard, Chronic Health Hazard
Massachusetts Right To Know Components:
Sodium nitrite, CAS-No. 7632-00-0; Revision Date: 2007-07-01
Phosphoric acid, CAS-No. 7664-38-2; Revision Date: 1993-04-24
Pennsylvania Right To Know Components:
Sodium nitrite, CAS-No. 7632-00-0; Revision Date: 2007-07-01
Phosphoric acid, CAS-No. 7664-38-2; Revision Date: 1993-04-24
NED, CAS-No. 1465-25-4
New Jersey Right To Know Components:
Sodium nitrite, CAS-No. 7632-00-0; Revision Date: 2007-07-01
Phosphoric acid, CAS-No. 7664-38-2; Revision Date: 1993-04-24
NED, CAS-No. 1465-25-4

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
Sodium nitrite	R8, R25, R50	S45, S61
Phosphoric acid	R22, R26, R34	S26, S45
NED	R36/37/38	S26, S36

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.