



Material Safety Data Sheet (MSDS)
Revision Date: 10-10-2017

Kit Name: VitroSure™ SRB Viability/Cytotoxicity Assay Kit
Catalog#: VB-4000L or VB-4000S

Components:

VB-4000	1×fixation solution
VB-4000	1× SRB staining solution
VB-4000	10×dye wash solution
VB-4000	1×dye solubilization solution

1. Identification of the Substance/Mixture and Company

Product Name	VitroSure™ SRB Viability/Cytotoxicity Assay Kit
Catalog#	VB-3000
Product Description	Kit Component
Manufacturer/Supplier	VitroVivo Biotech, LLC. 9605 Medical Center Dr., Suite 315, Rockville, MD 20850
Tel/fax Number	Phone: 301-500-0499; Toll free: 1-800-260-9817 Fax: 844-248-6208

2. Hazards Identification

Fixation solution	Contains Trichloroacetic Acid
SRB staining solution	SRB Dye
Dye wash solution	Contains Acetic Acid
Dye solubilization solution	Contains TRIS BASE

Trichloroacetic acid:

Emergency Overview

OSHA Hazards: Target organ effect, Corrosive, Carcinogen

Target Organs: Central nervous system

Other hazards which do not result in classification: Vesicant

GHS Classification:

Acute toxicity, Oral (Category 5)

Skin corrosion (Category 1A)

Serious eye damage (Category 1)

Acute aquatic toxicity (Category 1)

Chronic aquatic toxicity (Category 1)

GHS Label elements, including precautionary statements

Signal word: Danger

Hazard statement(s):

H303 May be harmful if swallowed.

H314 Causes severe skin burns and eye damage.

H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s):

P273 Avoid release to the environment.

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.

P310 Immediately call a POISON CENTER or doctor/physician.

HMIS Classification

Health hazard: 3

Chronic health hazard: N/A

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. Causes severe eye burns.

Ingestion: May be harmful if swallowed.

SRB Dye:

Emergency Overview

GHS Classification:

Skin irritation (Category 2), H315

Eye irritation (Category 2A), H319

Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335

GHS Label elements, including precautionary statements

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/ vapours/ 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.

P321 Specific treatment (see supplemental first aid instructions on this label).

P332 + P313 If skin irritation occurs: Get medical advice/ attention.

P337 + P313 If eye irritation persists: Get medical advice/ attention.

P362 Take off contaminated clothing and wash before reuse.

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

P405 Store locked up.

P501 Dispose of contents/ container to an approved waste disposal plant.

HMIS Classification

Health hazard: 2

Chronic health hazard: N/A

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. Vapors may cause drowsiness and dizziness.

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

Eyes: Causes eye irritation.

Ingestion: May be harmful if swallowed.

Acetic Acid:

Emergency Overview

Other hazards which do not result in classification: Explosive when dry.

GHS Classification: Skin corrosion (Category 1A), H314 Serious eye damage (Category 1), H318 GHS Label elements, including precautionary statements

Signal word: Danger Hazard statement(s): H314 Causes severe skin burns and eye damage. Precautionary statement(s): P264 Wash skin thoroughly after handling.

P280 Wear protective gloves/ protective clothing/ eye protection/ faceprotection.

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P310 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/ physician.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.
P363 Wash contaminated clothing before reuse.
P405 Store locked up.
P501 Dispose of contents/ container to an approved waste disposal plant.

HMIS Classification

Health hazard: 3
Chronic Health hazard: N/A
Flammability: 0
Physical hazards: 0

NFPA Rating

Health Hazard: 3
Fire: 0
Reactivity Hazard: 0

Potential Health Effects

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

Tris Base:

Classification of the substance or mixture Not a hazardous substance or mixture.

GHS Label elements, including precautionary statements Not a hazardous substance or mixture.

Hazards not otherwise classified (HNOC) or not covered by GHS This substance is not considered to be persistent, bioaccumulating nor toxic (PBT)

3. Composition/information on ingredients

Mixtures Description: Mixture of the substances listed below.

Composition	CAS#
Trichloroacetic acid	67-66-3
SRB Dye	2609-88-3
Acetic acid	64-19-7
Tris Base	77-86-1

4. First Aid Measures

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area

FIRST AID: CALL A PHYSICIAN.

SKIN: Wash off with soap and plenty of water. Consult a physician.

EYES: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician

INHALATION: If breathed in, move person into fresh air. If not breathing, give artificial respiration.

Consult a physician

5. Firefighting 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 combustion products formed under fire conditions— see section 10.

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. Remove all sources of ignition. 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. Contain spillage, pick up with an electrically protected vacuum cleaner or by wet-brushing and transfer to a container for disposal according to local regulations (see section 13). Soak up with inert absorbent material and dispose of as hazardous waste.

7. Handling and Storage

Precautions for safe handling Avoid contact with skin and eyes. Avoid inhalation of vapor or mist. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed. Keep away from sources of ignition – no smoking. Take measures to prevent the build up 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: 2-8°C.

8. Exposure Controls/Personal Protection

Components	Cas-No	Value	Control Parameter	Basis
Trichloroacetic acid	76-03-9	TWA	1 ppm	USA. ACGIH Threshold Limit Values (TLV)
Remarks:	Eye & upper respiratory tract irritation. Confirmed animal carcinogen with unknown relevance to humans			
		TWA	1 ppm 7mg/m ³	USA. OSHA – Table Z-1 Limits for Air Contaminants – 1910.1000
		TWA	1 ppm 7mg/m ³	USA. NIOSH recommended exposure limits

Acetic Acid, Tris Base, SRB Dye:

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.

9. Physical and Chemical Properties				
	Trichloroacetic acid	SRB Dye	Acetic Acid	Tris Base
General Information				
Appearance				
Form:	Fluid	Fluid	Fluid	Fluid
Color:	Colorless	Not determined	Colorless	Colorless
Odor:	Not determined	Not determined	Not determined	Not determined
Odor threshold	Not determined	Not determined	Not determined	Not determined
pH-value	Not determined	Not determined	Not determined	10.2 - 10.6 (20 °C)
Change in condition				
Melting point/Melting range:	Undetermined	Undetermined	Undetermined	Undetermined
Boiling point/Boiling range:	Undetermined	Undetermined	Undetermined	Undetermined
Flash point:	Not applicable.	Not applicable.	Not applicable.	Not applicable.
Flammability (solid, gaseous)	Not applicable.	Not applicable.	Not applicable.	Not applicable.
Ignition				
temperature:				
Decomposition temperature:	Not determined.	Not determined.	Not determined.	Not determined.
Auto igniting:	Product is not self-igniting.	Product is not self-igniting.	Product is not self-igniting.	Product is not self-igniting.
Danger of explosion:	Not determined.	Not determined.	Not determined.	Not determined.
Explosion limits:				
Lower	Not determined	Not determined	Not determined	Not determined
Upper	Not determined	Not determined	Not determined	Not determined
Vapor pressure at 20°C (68 °F)	Not determined.	Not determined.	Not determined.	Not determined.
Density at 20°C (68 °F):	Not determined.	Not determined.	Not determined.	Not determined.
Relative density:	Not determined.	Not determined.	Not determined.	Not determined.
Vapour density:	Not determined.	Not determined.	Not determined.	Not determined.
Evaporation rate:	Not determined.	Not determined.	Not determined.	Not determined.
Solubility in / Miscibility with Water:	Infinite.	Not determined	Not determined	Not determined
Segregation coefficient (n-octanol/water)	Not determined	Not determined	Not determined	Not determined
Dynamic:	Not determined	Not	Not	Not

Kinematic:	Not determined	determined Not	determined Not	determined Not
Other information	No further relevant information available.	determined No further relevant information available.	determined No further relevant information available.	determined No further relevant information available.

10 Stability and Reactivity

	Trichloroacetic acid	SRB Dye	Acetic Acid	Tris Base
Stability:	Stable at recommend storage conditions			
Conditions to Avoid	Avoid to heat	No data available	No data available	No data available
Materials to Avoid:	Strong oxidizing agents, strong bases, amines	Strong oxidizing agents	Strong oxidizing agents	Strong oxidizing agents
Hazardous Decomposition Products:	No data available	No data available	No data available	Nitrogen oxides (NO _x) Carbon oxides
Hazardous polymerization:	No data available	No data available	No data available	No data available

11. Toxicological Information

Trichloroacetic acid

Acute toxicity: LD50 Oral – rat – 3,320 mg/kg

Skin corrosion/irritation: no data available

Serious eye damage/eye irritation: Eyes – rabbit – severe eye irritation – 5 s **Respiratory or skin sensitization:** no data available

Germ cell mutagenicity: no data available

Carcinogenicity:

- IARC: 3 – Group 3: Not classifiable as to its carcinogenicity to humans (Trichloroacetic acid)
- 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:** May be harmful if absorbed through skin. Causes skin burns.
- **Eyes:** Causes eye burns. Causes severe eye burns.
- **Ingestion:** May be harmful 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.

Additional information: RTECS: AJ7875000

SRB Dye:

Acute toxicity: LD50 Oral – rat – 475 mg/kg → Remarks: Behavioral: Altered sleep time (including change in righting reflex).

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

Aspiration hazard: no data available

Potential Health Effects

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

Signs and Symptoms of Exposure: Exposure may cause 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.

Synergistic effects: no data available

Additional information: RTECS: not available

Acetic 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
Aspiration hazard: no data available

Potential Health Effects

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

Signs and Symptoms of Exposure: Exposure may cause 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. Synergistic effects: no data available Additional information: RTECS: not available

Tris Base:

Acute toxicity LD50 Oral - rat - > 3,000 mg/kg

Inhalation: no data available LD50

Dermal - rat - > 5,000 mg/kg (OECD Test Guideline 402) no data available

Skin corrosion/irritation Skin - rabbit Result: No skin irritation (OECD Test Guideline 404)

Serious eye damage/eye irritation Eyes - rabbit Result: No eye irritation (OECD Test Guideline 405)

Respiratory or skin sensitisation Buehler Test - guinea pig Does not cause skin sensitisation. (OECD Test Guideline 406)

Germ cell mutagenicity Result: Not mutagenic in Ames Test. in vitro assay Result: negative In vitro tests did not show mutagenic effects Result: In vivo tests did not show any chromosomal changes.

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: no data available

Specific target organ toxicity - repeated exposure: no data available

Aspiration hazard: no data available

Additional Information Repeated dose toxicity - rat - Oral - No observed adverse effect level - 1,000 mg/kg RTECS: TY2900000 To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. Ecological Information

Trichloroacetic acid:

Persistence and degradability: Biodegradability (Zahn-Wellens Test)->result:5%-not readily biodegradable.

Toxicity:

- Toxicity to fish: LC50 – Pimephales promelas (fathead minnow) – 2,000 mg/l – 96 h.
- Toxicity to daphnia and other aquatic invertebrates: EC50- Daphnia magna (Water flea) –1,460-2,000 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 with long lasting effects.

SRB Dye:**Toxicity** No data available**Persistence and degradability** No data available**Bioaccumulative potential** No data available**Mobility in soil** No data available**Results of PBT and vPvB assessment:** PBT/vPvB assessment not available as chemical safety assessment not required/not conducted**Other adverse effects** No data available**Acetic Acid:****Toxicity**

- Toxicity to fish semi-static test LC50 - *Oncorhynchus mykiss* (rainbow trout) - > 1,000 mg/l - 96 h (OECD Test Guideline 203)
- Toxicity to daphnia and other aquatic invertebrates EC50 - *Daphnia magna* (Water flea) - > 300.82 mg/l - 48 h (OECD Test Guideline 202)

Persistence and degradability Biodegradability aerobic - Exposure time 30 d Result: 99 % - Readily biodegradable. Remarks: Expected to be biodegradable Biochemical Oxygen Demand (BOD) 880 mg/g**Bioaccumulative potential** No data available**Mobility in soil** No data available**Results of PBT and vPvB assessment** PBT/vPvB assessment not available as chemical safety assessment not required/not conducted**Other adverse effects** Additional ecological information No data available**Tris Base****Ecotoxicity** Not available.**Toxicity of the Products of Biodegradation :** The product itself and its products of degradation are not toxic.**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. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable.

Contaminated packaging: Dispose of as unused product.

14. Transport Information**Trichloroacetic acid:****DOT (US):** UN-number: 1839, Class: 8, Packing group: II; Proper shipping name: Trichloroacetic acid; Marine pollutant: No; Poison inhalation hazard: No**IMDG:** UN-number: 1839, Class: 8, Packing group: II; EMS-No: F-A, S-B; Proper shipping name: TRICHLOROACETIC ACID; Marine pollutant: No**IATA:** UN-number: 1839, Class: 8, Packing group: II; Proper shipping name: Trichloroacetic acid**SRB Dye& Tris Base:**

DOT (US): Not dangerous goods.

IMDG: Not dangerous goods.

IATA: Not dangerous goods.

Acetic Acid:

DOT (US) UN number: 2790 Class: 8 Packing group: III Proper shipping name: Acetic acid solution Reportable Quantity (RQ): Poison Inhalation Hazard: No

IMDG UN number: 2790 Class: 8 Packing group: III EMS-No: F-A, S-B Proper shipping name: ACETIC ACID, SOLUTION

IATA UN number: 2790 Class: 8 Packing group: III Proper shipping name: Acetic acid solution

15. Regulatory Information

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

16. Other Information

This information contained herein is believed to be accurate but is not warranted to be so. Data and calculations are based on information furnished by the manufacturer of the product and manufacturers of the components of the product. Users are advised to confirm in advance of need that information is current, applicable and suited to the circumstances of use. Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Furthermore, vendor assumes no responsibility for injury caused by abnormal use of the material even if reasonable safety procedures are followed. Any questions regarding this product should be directed to the manufacturer of the product as described in Section 1.

Abbreviations and acronyms:

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

ACGIH: American Conference of Governmental Industrial Hygienists

NFPA: National Fire Protection Association (USA)

HMIS: Hazardous Materials Identification System (USA)

LC50: Lethal concentration, 50 percent LD50: Lethal dose, 50 percent

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