

# SAFETY DATA SHEET

Cat# 2308-50, -250, Disulfiram

SDS DATE: May 31, 2013

## SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT NAME:** Disulfiram  
**PRODUCT CODES:** Cat# 2308-50, -250  
**MANUFACTURER:** BioVision, Inc.  
**ADDRESS:** 155 S. Milpitas Boulevard, Milpitas, CA 95035  
**EMERGENCY PHONE:** 858-373-8066  
**CHEMTREC PHONE:**  
**OTHER CALLS:** 408-493-1800  
**FAX PHONE:** 408-493-1801

## SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

Component	Description	Volume	Safety Information
Disulfiram	Solid	2308-50: 50 mg 2308-250: 250 mg	See below

## SECTION 3: HAZARDS IDENTIFICATION

Product Name/Chemical Name	CAS Number	EC-No.	Molecular Weight	Chemical Formula
Disulfiram	97-77-8	202-607-8	296.54	C <sub>10</sub> H <sub>20</sub> N <sub>2</sub> S <sub>4</sub>

### Disulfiram:

#### Emergency Overview

**OSHA Hazards:** Target organ effect, Toxic by ingestion, Skin sensitizer

**Target Organs:** Liver, Nerves, Kidney

**GHS Classification:** Acute toxicity, Oral (Category 3)  
Skin sensitization (Category 1)  
Specific target organ toxicity – repeated exposure (Category 2)  
Acute aquatic toxicity (Category 1)  
Chronic aquatic toxicity (Category 1)

#### GHS Label elements, including precautionary statements



#### Pictogram:

**Signal word:** Warning

**Hazard statement(s):** H301 Toxic if swallowed.  
H317 May cause an allergic skin reaction.  
H373 May cause damage to organs through prolonged or repeated exposure.  
H410 Very toxic to aquatic life with long lasting effects.

**Precautionary statement(s):** P261 Avoid breathing dust/fume/gas/mist/vapors/spray.  
P273 Avoid release to the environment.  
P280 Wear protective gloves.  
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.  
P302+P352 IF ON SKIN: Wash with plenty of soap and water.  
P330 Rinse mouth.  
P333+P313 If skin irritation or rash occurs: Get medical advice/attention.

#### 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. May cause respiratory tract irritation.

**Skin:** May be harmful if absorbed through skin. May cause skin irritation.

**Eyes:** May cause eye irritation.

**Ingestion:** Toxic if swallowed.

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## 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:** Flush eyes with water as a precaution.

**If swallowed:** Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

## 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.

## 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.

### 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

Components	CAS-No.	Value	Control parameters	Basis
Tetraethylthiuram disulfide	97-77-8	TWA	2 mg/m <sup>3</sup>	USA. ACGIH Threshold Limit Values (TLV)
Remarks:	Nausea. Vasodilation. Not classifiable as a human carcinogen.			
		TWA	2 mg/m <sup>3</sup>	USA. OSHA – TABLE Z-1 Limits for Air Contaminants – 1910.1000
		TWA	2 mg/m <sup>3</sup>	USA. NIOSH Recommended Exposure Limits
	Various isomers of TDA exist.			

### Personal protective equipment

#### Respiratory protection

For nuisance exposures use type P95 (US) or type P1 (EU EN 143) particle respirator. For higher level protection use type OV/AG/P99 (US) or type ABEK-P2 (EU EN 143) respirator cartridges. 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 the workday.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Property	Disulfiram
<b>Appearance:</b>	Pale yellow solid
<b>pH:</b>	No data available
<b>Water Solubility:</b>	No data available
<b>Other Solubility:</b>	DMSO (~6 mg/ml) or EtOH (~30 mg/ml)
<b>Boiling Point (°C):</b>	117 °C (243 °F)

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Melting Point (°C):	69-71 °C (156-160 °F)
Flash Point (°C):	No data available
Ignition Temperature (°C):	No data available
Density:	1.3 g/cm <sup>3</sup>

## SECTION 10: STABILITY AND REACTIVITY

Property	Disulfiram
Chemical stability	Stable under recommended storage conditions
Conditions to avoid:	No data available
Materials to avoid:	Strong oxidizing agents
Hazardous decomposition products:	Carbon oxides, nitrogen oxides, sulfur oxides

## SECTION 11: TOXICOLOGICAL INFORMATION

### Disulfiram:

**Acute toxicity:** LD50 Oral – rabbit – 1,800 → Remarks: Peripheral Nerve and Sensation: Flaccid paralysis without anesthesia (usually neuromuscular blockage). Behavioral: Ataxia. Nutritional and Gross Metabolic: Changes in: Body temperature decrease.

LD50 Oral – mouse – 1,980 mg/kg

LD50 Intraperitoneal – rat – 248 mg/kg → Remarks: Behavioral: Change in motor activity (specific assay). Nutritional and Gross Metabolic: Changes in: Body temperature decrease.

LD50 Intraperitoneal – mouse – 75 mg/kg

LD50 Subcutaneous – mouse – 2,600 mg/kg

**Skin corrosion/irritation:** no data available

**Serious eye damage/eye irritation:** Eyes – rabbit – no eye irritation – OECD Test Guideline 405

**Respiratory or skin sensitization:** no data available

**Germ cell mutagenicity:** Genotoxicity in vitro – hamster – Ovary → Sister chromatid exchange

Genotoxicity in vitro – hamster – Embryo → Morphological transformation

Genotoxicity in vitro – chicken – Embryo → Other mutation test systems

Genotoxicity in vitro – mouse – Embryo → DNA inhibition

Genotoxicity in vitro – mouse – Lymphocyte

Genotoxicity in vitro – chicken – Embryo → DNA inhibition

Genotoxicity in vivo – mouse – Oral → Sister chromatid exchange

Genotoxicity in vivo – rat – Oral → Morphological transformation

**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 (Tetraethylthiuramdisulfide)

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):** May cause damage to organs through prolonged or repeated exposure.

### 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:** Toxic if swallowed.

**Signs and Symptoms of Exposure:** A serious toxic interaction has been observed in rats fed Tetraethylthiuram (antabuse, ro-sulfiram) and then exposed to vapors of 1,2-dibromoethane. May cause nervous system disturbances, lethargy, ataxia, seizures, coma, and/or thyroid enlargement.

**Synergistic effects:** no data available

**Additional information:** RTECS: JO1225000

## SECTION 12: ECOLOGICAL INFORMATION

### Disulfiram:

**Persistence and degradability:** no data available

**Toxicity: Toxicity to fish:** LC50 – Poecilia reticulata (guppy) – 0.187 mg/l – 96 h → Method: OECD Test Guideline 203

**Toxicity to daphnia and other aquatic invertebrates:** LC50 – Daphnia magna (Water flea) – 0.12 mg/l – 48 h

**Toxicity to algae:** Growth inhibition EC50 – Chlorella pyrenoidosa – 1.8 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:** Very toxic to aquatic life with long lasting effects.

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

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## 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. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

**Contaminated packaging:** Dispose of as unused product.

## SECTION 14: TRANSPORT INFORMATION

### Disulfiram:

**DOT (US):** Not dangerous goods.

**IMDG:** UN-Number: 3077, Class: 9, Packing group: III; EMS-No: F-A, S-F; Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Tetraethylthiuramdisulfide); Marine pollutant: Yes

**IATA:** UN-Number: 3077, Class: 9, Packing group: III; Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Tetraethylthiuramdisulfide)

**Further information:** EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packaging and combination packaging containing inner packaging with Dangerous Goods >5 L for liquids or >5 kg for solids.

## SECTION 15: REGULATORY INFORMATION

### Disulfiram:

**OSHA Hazards:** Target organ effect, Toxic by ingestion, Skin sensitizer

**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:** Acute Health Hazard, Chronic Health Hazard

**Massachusetts Right To Know Components:** Disulfiram, CAS-No. 97-77-8; Revision Date: 2007-03-01

**Pennsylvania Right To Know Components:** Disulfiram, CAS-No. 97-77-8; Revision Date: 2007-03-01

**New Jersey Right To Know Components:** Disulfiram, CAS-No. 97-77-8; 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

Component	Risk Phrases	Safety Phrases
Disulfiram	R25, R43, R48/25, R50/53	S24, S37, S60, S61

## 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.