



Material Safety Data Sheet


MSDS/SDS Number: 00000371MSDS
Latest Revision Date: October 6, 2009
Revision: A

SECTION 1 IDENTIFICATION OF THE SUBSTANCE OR PREPARATION AND OF THE COMPANY/UNDERTAKING

Product Name: CellCiphr Cytotoxicity Assay, Human HepG2 cells Anisomycin Solution
Catalogue Number(s): HCS100
Chemical Name: Aqueous solution of 1,4,5-trideoxy-1,4-imino-5-(p-methoxyphenyl)-D-xylo-pentitol 3-acetate in Dimethyl Sulfoxide.
Synonyms: None
Intended Product Use: Liquid reagent used in cytotoxicity assay research.
Manufacturer/Distributor: Millipore Corporation (Corporate Headquarters) Millipore S.A.S. (European Headquarters)
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SECTION 2 HAZARDS IDENTIFICATION

GHS Hazard Class: Acute Toxicity: Category 4
Serious Eye Damage/ Eye Irritation: Category 2B
Skin Corrosion/ Irritation: Category 3
Flammable Liquids: Category 4

Signal Word and Hazard Statement:  Warning: Harmful if inhaled (gas, dust, mist, vapor) (H332)
Warning: Harmful if swallowed (oral) (H302)
Warning: Harmful in contact with skin (dermal) (H312)
Warning: Irritating to eyes (H320)
Warning: Causes mild skin irritation (H316)
Warning: Combustible Liquid

**EU Hazard Symbol
Pictogram:**



Xn (R20/21/22)



F (R30)

SECTION 3 COMPOSITION/INFORMATION ON INGREDIENTS

Identification of Dangerous Components: This product contains the substances listed below, which are defined as dangerous substances or hazardous chemicals as defined in European Community Directives 67/548/EEC or 1999/45/EC, and Hazard Communication Standard 29 CFR 1910.1200.

Dangerous Component	EINECS or ELINCS No.	CAS No.	Content (weight percent)	EU Hazard Symbol Letters*†	R Phrases** †
1,4,5-trideoxy-1,4-imino-5-(p-methoxyphenyl)-D-xylo-pentitol 3-acetate:	245-269-7	22862-76-6	7 %	N/A	N/A
Dimethyl Sulfoxide:	200-664-3	67-68-5	93 %	N/A	N/A

* Symbol letters and categories of danger: **T+** = Very toxic, **T** = Toxic, **C** = Corrosive, **Xn** = Harmful, **Xi** = Irritant, **E** = Explosive, **F+** = Extremely flammable, **F** = Very flammable, **N** = Dangerous for the environment, **O** = Oxidising.

** The full text of each R phrase is listed in Section 15.

† Symbols letters and R Phrases are assigned to each dangerous component for the highest concentration range as defined in 67/548/EEC and 1999/45/EC.

SECTION 4 FIRST AID MEASURES

Treatment Measures:

Contact with Eyes: If the product contacts the eyes, promptly wash (irrigate) the eyes with large amounts of tepid water for at least 15 minutes, occasionally lifting the lower and upper lids. Seek medical attention immediately.

Ingestion: Seek medical attention immediately. Never give an unconscious person anything by mouth.

Symptoms of Exposure:

May cause mild eye irritation. Two drops of >50% Dimethyl Sulfoxide in the rabbit eye caused a temporary burning sensation and vasodilatation, but concentrations of <50% exhibited no effect. Dimethyl Sulfoxide produced slight erythema of the conjunctiva over the first 3 days of the study, and a low level of key scoring was also recorded for chemosis, iritis and corneal opacity. The degree of eye injury described by these key scores would not result in Dimethyl Sulfoxide being labeled as an eye irritant according to EEC classification.

May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause central nervous system effects. May cause garlic smell on the breath and body.

Inhalation:	If a person inhales large amounts of the product move the exposed person to fresh air at once. If breathing is difficult or stops seek immediate medical attention.	Possible respiratory tract and mucous membrane irritation. Material has a very low vapor pressure at room temperature, so inhalation exposures are not expected unless material is heated or misted.
Skin Contact:	If the product contacts the skin, immediately flush the contaminated skin with mild soap and water. If this chemical penetrates clothing immediately remove the clothing and flush the skin with water. Seek medical attention immediately.	Dimethyl Sulfoxide readily penetrates skin and may significantly enhance the absorption of numerous chemicals. Increased absorption of these other chemicals could lead to their increased toxicity. Skin sensitization was not observed with Dimethyl Sulfoxide in human volunteers or in guinea pigs. Non-immunological whealing and flaring have been observed in animals and humans following short-term contact. Skin absorption of Dimethyl Sulfoxide may result in a garlic-like breath and body odor, and CNS effects such as headache, nausea and dizziness. Undiluted Dimethyl Sulfoxide applied topically to mice twice a week for 30 weeks failed to produce dermal injury. Skin sensitization has not been reported in hundreds of human volunteers participating in a Dimethyl Sulfoxide clinical trial. The ability to increase the absorption of other chemicals is its most significant occupational hazard.

SECTION 5 FIRE FIGHTING MEASURES

Suitable Extinguishing Media:	Use extinguishing media appropriate for the surrounding fire. This product is compatible with commercially available extinguishing media.
Special Protective Equipment for Firefighters:	This product does not require the use of any additional fire fighting equipment beyond what is appropriate to the surrounding fire.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal Precautions:	Wear chemical resistant boots, clothing, eye protection, and gloves to prevent skin contact (See Section 8).
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- Small Spills:** Identify the spilled material(s). Barricade the spill area and notify others in the surrounding areas. Control all sources of ignition if the substance is flammable. Don the appropriate personal protective equipment (See section 8). Control the movement of the spilled product (into drains, soil, across floors etc.) with absorbent spill materials. Collect contaminated spill material and place in container meeting appropriate U.N. packaging requirements. Decontaminate used equipment and affected spill area appropriately.
- Large Spills:** In addition to small spill precautions, determine personnel evacuation distances. Notify appropriate authorities if necessary.
- Environmental Precautions:** Collect and dispose of contaminated materials according to international, federal, state and local regulations. Keep away from surface and ground water, drains, and soil.

SECTION 7 HANDLING AND STORAGE

- Handling:** Seek appropriate training to safely handle this product under normal conditions. Use the recommended personal protective equipment (See Section 8) to prevent chemical exposures. Wash hands with soap and water before eating, drinking, or touching common items (phone, computer, etc.) to prevent cross contamination. Use this product with adequate ventilation. See product technical data sheet for details.
- Storage:** See product technical data sheet for details.
- Specific use:** See product technical data sheet for details.

SECTION 8 EXPOSURE CONTROL AND PERSONAL PROTECTION

Exposure Limit Values:	OSHA PEL	NIOSH REL	ACGIH TLV	Other
1,4,5-trideoxy-1,4-imino-5-(p-methoxyphenyl)-D-xylo-pentitol 3-acetate:	Not Listed	Not Listed	Not Listed	None
Dimethyl Sulfoxide:	Not Listed	Not Listed	Not Listed	None
	Normal Handling Conditions		Emergency Response Conditions	
Engineering Controls:	General room ventilation is adequate for the use of this product.		Provide negative pressure ventilation.	
Respiratory Protection	Use appropriate respiratory protection.		Use appropriate respiratory protection.	
Eye Protection:	Safety glasses with side shields.		Chemical splash goggles or other face protection as appropriate.	
Skin Protection:	Laboratory coat, adequate chemical-resistant gloves.		Chemically resistant boots, clothes, and impermeable gloves as appropriate.	
Environmental Exposure Controls:	Not Available.		Not Available.	
Other Equipment:	Safety shower, eyewash stations, and hand washing equipment should be available close to the work area as needed.			

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear Colorless Liquid	
Odor:	Garlic Like	
Odor Threshold:	Not Available	
pH:	Not Available	
Melting Point/Freezing Point:	15 - 17°C	
Initial Boiling Point and Boiling Range:	190- 191°C	
Flash Point:	90°C estimated (closed cup)	
Evaporation Rate, 20 °C:	Not Available	
Flammability (Solid/Gas):	Not Available	
Explosive Limits:	LEL: Not Available	UEL: Not Available
Vapor Pressure:	0.3-0.4 mm Hg	
Vapor Density, 20 °C:	Not Available	
Relative Density (Water = 1.0):	1.1	
Solubility:	Soluble	
Partition Coefficient (n-octanol/water):	Not Available	
Auto Ignition Temperature (ASTM D1929):	Not Available	
Decomposition Temperature:	Not Available	
Oxidizing Properties:	None	
Viscosity, Centipoise:	Not Available	

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability:	Product is stable under normal operating conditions and use as described in the product technical data sheet.
Conditions to Avoid:	See product technical data sheet for details.
Incompatible Materials to Avoid:	Strong acids or bases, strong oxidizers, Violent or explosive reaction with many acyl, aryl, and nonmetal halides (eg acetyl chloride, benzenesulfonyl chloride, bromobenzoyl actanilide, cyanuric chloride, iodine pentafluoride, Mg(ClO ₄) ₂ , CH ₃ Br, NiO ₄ , oxalyl chloride, P ₂ O ₃ , phosphorus trichloride, phosphoryl chloride, silver fluoride, silver difluoride, sodium hydride, sulfur dichloride, disulfur dichloride, sulfurylchloride, tetrachlorosilane, and thionyl chloride). Magnesium perchlorate, metal oxosalts, perchloric acid, periodic acid, sulfur trioxide. Forms powerfully explosive mixtures with metal salts of oxoacids (eg aluminum perchlorate, sodium perchlorate, and iron (III) nitrate). Violent or explosive reaction with boron compounds (eg borane, nonahydranonaborate (2-) ion), 4(4'- bromobenzoyl) acetanilide, carbonyl diisothiocyanate, dinitrogen tetraoxide, hexachlorocyclotriphosphazine, copper + trichloroacetic acid, metal alkoxides (eg potassium tert-butoxide, sodium isopropoxide), and

trifluoroacetic acid anhydride.

Hazardous Decomposition Products: When heated to decomposition it emits toxic fumes of sulfur oxides, formaldehyde, dimethyl sulfide, carbon monoxide and carbon dioxide.

SECTION 11 TOXICOLOGICAL INFORMATION

Toxicology Data: Toxicological information for this product as a whole does not exist, below is data for the individual components.

1,4,5-trideoxy-1,4-imino-5-(p-methoxyphenyl)-D-xylo-pentitol 3-acetate: RTECS #BZ9800000

Dimethyl Sulfoxide: RTECS #PV6210000

	Toxicity Test	Exposure Route	Dose	Observed Effect
Acute Toxicity:				
1,4,5-trideoxy-1,4-imino-5-(p-methoxyphenyl)-D-xylo-pentitol 3-acetate:	LD ₅₀ (Rat)	Oral	72 mg/kg	N/A ¹
	LD ₅₀ (Rat)	Intraperitoneal	345 mg/kg	Convulsions or effect on seizure threshold ;Respiratory depression ¹
	LD ₅₀ (Mouse)	Subcutaneous	600 mg/kg	N/A ¹
Dimethyl Sulfoxide:	Lowest Published Toxic Concentration (Rat)	Inhalation	2.783 gm/m ³ /90 day-intermittent	Olfaction: Other olfaction effects ²
	LD ₅₀ (Rat)	Oral	14,500 mg/kg	Eye: Hemorrhage Eye: Conjunctiva irritation ²
	Lowest Published Toxic Dose (Human Female)	Skin	1,800 mg/kg	Lung, Thorax, or Respiration: Dyspnea Lung, Thorax, or Respiration: Cyanosis Blood: Other changes ²
	LD ₅₀ (Rat)	Skin	40,000 mg/kg	N/A ²
Skin Corrosion/Irritation:				
Dimethyl Sulfoxide:	Skin Irritation (Rabbit)	Skin	10 mg/24 hour	Mild ²
	Open Irritation Test (Rabbit)	Skin	500 mg/24 hour	Mild ²
Serious Eye Damage/Eye Irritation:				
Dimethyl Sulfoxide:	Eye Irritation (Rabbit)	Eye	500 mg/24 hour	Mild ²
	Eye Irritation (Rabbit)	Eye	100 mg	Mild ²

Respiratory or Skin Sensitization:	Not Available		
Germ Cell Mutagenicity:	Not Available		
Reproductive Toxicity:	Not Available		
STOST-Single Exposure:	Not Available		
STOST-Repeated Exposure:	Not Available		
Aspiration Hazard:	Not Available		
Carcinogenicity:	Carcinogenetic information for this product as a whole does not exist, below is data for the individual components.		
Research Agency:	OSHA:	NTP:	IARC:
1,4,5-trideoxy-1,4-imino-5-(p-methoxyphenyl)-D-xylo-pentitol 3-acetate:	Not Listed	Not Listed	Not Listed
Dimethyl Sulfoxide:	Not Listed	Not Listed	Not Listed

SECTION 12 ECOLOGICAL INFORMATION

Ecotoxicity:	Ecotoxicity information for this product as a whole does not exist, below is data for the individual components.
1,4,5-trideoxy-1,4-imino-5-(p-methoxyphenyl)-D-xylo-pentitol 3-acetate:	Not Available
Dimethyl Sulfoxide:	LC ₅₀ Oryzias Latipes 24 Hours 88,000,000 ug/L ³ LC ₅₀ Oryzias Latipes 48 Hours 52,000,000 ug/L ³ LC ₅₀ Pimephales Promelas 96 Hours 34,000,000 ug/L ⁴
Mobility:	
Dimethyl Sulfoxide:	<p>Terrestrial Fate: Based on a classification scheme, an estimated Koc value of 4, determined from a log Kow of -1.35 and a regression-derived equation, indicates that dimethyl sulfoxide is expected to have very high mobility in soil. Volatilization of dimethyl sulfoxide from moist soil surfaces is not expected to be an important fate process given a Henry's Law constant of 1.5X10⁻⁹ atm-cu m/mole. Dimethyl sulfoxide is not expected to slowly volatilize from dry soil surfaces based upon a vapor pressure 6.1X10⁻¹ mm Hg. After 14 days incubation with an activated sludge inoculum, a theoretical BOD of 3% indicates that biodegradation may not be an important environmental fate process in water.⁵</p> <p>Aquatic Fate: Based on a classification scheme, an estimated Koc value of 4, determined from a log Kow of -1.35 and a regression-derived equation, indicates that dimethyl sulfoxide is not expected to adsorb to suspended solids and sediment. Volatilization from water surfaces is not expected based upon a Henry's Law constant of 1.5X10⁻⁹ atm-cu m/mole. According to a classification scheme, bioconcentration studies resulting in BCF <1 suggest the potential for bioconcentration in aquatic organisms is low. After 14 days incubation with an activated sludge inoculum, a theoretical BOD of 3% indicates that biodegradation may not be an important environmental fate process in water.⁵</p> <p>Atmospheric Fate: According to a model of gas/particle partitioning of semivolatile organic compounds in the atmosphere, dimethyl sulfoxide, which has a vapor pressure of 1.6X10⁻¹ mm Hg at 25 deg C, is expected to exist solely as a vapor in the atmosphere. In the atmosphere, two reported reaction rate constants for the reaction of dimethyl sulfoxide with photochemically-</p>

produced hydroxyl radicals are 6.2×10^{-11} cu cm/molecule-sec and 5.9×10^{-11} cu cm/molecules-sec, corresponding to half-lives of 6.6 and 6.2 hrs, respectively, at an atmospheric concentration of 5×10^5 hydroxyl radicals per cu cm. Dimethyl sulfoxide does not absorb light at wavelengths >290 nm and therefore is not expected to be susceptible to direct photolysis by sunlight.⁵

Persistence and Degradation:

Dimethyl Sulfoxide: Aerobic: Dimethyl sulfoxide, present at 100 mg/L, reached 3% of its theoretical BOD in 2 weeks using an activated sludge inoculum at 30 mg/L and the Japanese MITI test. No degradation of dimethyl sulfoxide ($<20\%$) was noted in a screening test using an activated sludge inoculum.⁵

Anarobic: A variety of microorganisms, including some that are found in anaerobic lake mud, have the ability to transform dimethyl sulfoxide to dimethyl sulfide, however specific test details were not available.⁵

Bio Accumulative Potential:

Dimethyl Sulfoxide: A BCF of <1 was observed for dimethyl sulfoxide, using orange-red killifish (*Oryzias latipes*) which were exposed over an 8-week period. According to a classification scheme,⁵ this BCF suggests that bioconcentration in aquatic organisms is low.

Results of PBT Assessment: Not Available

Other Adverse Effects: None Known

SECTION 13 DISPOSAL INFORMATION

Substance: Dispose of unused contents in accordance with international, federal, state, and local regulations.

Contaminated Packaging: Dispose of container in accordance with international, federal, state and local requirements.

SECTION 14 TRANSPORTATION INFORMATION

UN Number: Not Listed

Class: Not Listed

Proper Shipping Name: Not Listed

Packing Group: Not Listed

Marine Pollutant: Not Listed

Other Applicable Information: None

SECTION 15 REGULATORY INFORMATION

Australia: Hazchem Code: Not Listed

Poisons Schedule Number: Not Listed

California: Proposition 65 Listed: Not Listed

Canada: WHMIS: D2B, B3

European Union:	<p>REACH: Chemical Safety Assessment for the substance or substances in the preparation not required.</p> <p>Substances of Very High Concern (SVHC) - October 28th, 2008: This product does not contain SVHC's in concentrations above 0.1% weight/weight.</p> <p>Category of Danger: Xn: Harmful F: Flammable</p> <p>Risk Phrases: R20/21/22: Harmful by inhalation, in contact with skin and if swallowed. R30: Can become highly flammable in use.</p> <p>Safety Phrases: S7/9: Keep container tightly closed and in a well-ventilated place. S20/21: When using do not eat, drink or smoke. S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S27/28: After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of soap and tepid water. S29/35: Do not empty into drains; dispose of this material and its container in a safe way. S36/37/39: Wear suitable protective clothing, gloves and eye/face protection. S45: In case of accident or if you feel unwell, seek medical advice immediately</p> <p>OECD/High Production Volume (HPV) Chemicals: Not Listed</p> <p>RoHS: This product does not contain RoHS listed substances in concentrations above the established thresholds.</p>
Japan:	<p>Poisonous and Deleterious Substances Control Law: Not Listed</p>

SECTION 16 ADDITIONAL INFORMATION

Training Advice: Seek effective chemical handling training to reduce the hazards associated with this product prior to use.

Technical Contact: <http://www.millipore.com/support>

Abbreviations Used	<p>ACGIH American Conference of Government Industrial Hygienists</p> <p>ADR European agreement on the international carriage of dangerous goods on road</p> <p>CAS Chemical Abstract Service</p> <p>EINECS European Inventory of Existing Commercial Chemical Substances</p> <p>ELINCS European List of Notified Chemical Substances</p> <p>EPA United States Environmental Protection Agency</p> <p>IARC International Agency for Research in Cancer.</p> <p>IATA International Air Transport Association</p>
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ICAO	International Civil Aviation Organization
IMDG	Regulations regarding the transportation of dangerous goods on ocean-going vessels issued by the International Maritime Organization.
LC ₅₀	Lethal Concentration 50% is the concentration of a chemical which kills 50% of a sample population
LD ₅₀	Lethal Dose 50% is the dose of a chemical which kills 50% of a sample population.
LDLo	Lowest observed lethal dose
LEL	Lower Explosive Limit
MSFU	Manufacture, Formulation, Supply and Use (Section 13)
NIOSH	National Institute of Occupational Safety and Health (US)
NTP	National Toxicology Program (US)
OSHA	United States Occupational Safety and Health Administration
RID	International regulations concerning the international carriage of dangerous goods by rail.
RTECS	Registry of Toxic Effects of Chemical Substances (US)
STOST	Specific Target Organ Systemic Toxicity
UEL	Upper Explosive Limit
WHMIS	Workplace Hazardous Materials Information System (Canada)

This safety data sheet has been prepared to comply with the requirements of the European Union regulation on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) 1906/2006 and ANSI standard Z400.1-1998.

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¹ Centers for Disease Control and Prevention, 1600 Clifton Rd, Atlanta, GA 30333, USA, National Institute for Occupational Health and Safety (NIOSH), Registry of Toxic Effects of Chemical Substances (RTECS) File #BZ9800000, 2009.

² Centers for Disease Control and Prevention, 1600 Clifton Rd, Atlanta, GA 30333, USA, National Institute for Occupational Health and Safety (NIOSH), Registry of Toxic Effects of Chemical Substances (RTECS) File # PV6210000, 2009.

³ Tsuji, S., Y. Tonogai, Y. Ito, and S. Kanoh, The Influence of Rearing Temperatures on the Toxicity of Various Environmental Pollutants for Killifish (*Oryzias latipes*), *J.Hyg.Chem.(Eisei Kagaku)* 32(1):46-53 (JPN) (ENG ABS), 1986.

⁴ Geiger, D.L., L.T. Brooke, and D.J. Call, Acute Toxicities of Organic Chemicals to Fathead Minnows (*Pimephales promelas*), *Ctr.for Lake Superior Environ.Stud., Univ.of Wisconsin-Superior, Superior, WI* 5:332 p., 1990.

⁵ U.S. National Library of Medicine, 8600 Rockville Pike, Bethesda, MD 20894, National Institutes of Health, Health & Human Services, (<http://toxnet.nlm.nih.gov/cgi-bin/sis/search/f?./temp/~imNF8o:1>).