

MATERIAL SAFETY DATA SHEET

Assay Buffer (10X)

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Cayman Chemical Company
1180 E. Ellsworth Rd.
Ann Arbor, MI 48108

Printed: 01/08/2009
Revision: 01/05/2009
Supersedes Revision: 01/28/2006
Date Created: 08/01/2001

1. Product and Company Identification

Product Code: 760154
Product Name: Assay Buffer (10X)
Manufacturer Information
Company Name: Cayman Chemical Company
Emergency Contact: Cayman Chemical Company (800)364-9897
Information: Cayman Chemical Company (734)971-3335
Chemical Family: EIA - Other

2. Composition/Information on Ingredients

Hazardous Components (Chemical Name)	CAS #	Concentration	OSHA PEL	ACGIH TLV	Other Limits
1. Trizma base	77-86-1	12.11 %	No data.	No data.	No data.
2. Water	7732-18-5	87.89 %	No data.	No data.	No data.
Hazardous Components (Chemical Name)	RTECS #	OSHA STEL	OSHA CEIL	ACGIH STEL	ACGIH CEIL
1. Trizma base	TY2900000	No data.	No data.	No data.	No data.
2. Water	ZC0110000	No data.	No data.	No data.	No data.

3. Hazards Identification

Emergency Overview: No data available.
Route(s) of Entry: Inhalation? Yes Skin? Yes Eyes? Yes Ingestion? Yes Other: Injection
Potential Health Effects (Acute and Chronic): Irritant.
Irritating to eyes, respiratory system and skin.
Material may be irritating to the mucous membranes and upper respiratory tract.
May be harmful by inhalation, ingestion, or skin absorption.
The toxicological properties of this compound have not been fully evaluated.
Signs and Symptoms Of Exposure: No data available.

4. First Aid Measures

Emergency and First Aid Procedures: If inhaled remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Get immediate medical attention.
If swallowed, wash out mouth with water provided person is conscious. Never give anything by mouth to an unconscious person. Get medical attention. Do NOT induce vomiting unless directed to do so by medical personnel.
In case of contact with eyes, hold eyelids apart and flush eyes with plenty of water. After initial flushings, remove any contact lenses and continue flushing for at least 20 minutes. Have eyes examined and tested by medical personnel.
In case of skin contact, immediately wash skin with soap and plenty of water. Remove contaminated clothing. Get medical attention if symptoms occur. Wash clothing before reuse.

5. Fire Fighting Measures

Flash Pt: No data.
Explosive Limits: LEL: No data. UEL: No data.
Fire Fighting Instructions: As in any fire, wear self-contained breathing apparatus pressure-demand (MSHA/NIOSH approved or equivalent), and full protective gear to prevent contact with skin and eyes.
Flammable Properties and Hazards: No data available.
Extinguishing Media: Use alcohol foam, carbon dioxide, or water spray when fighting fires involving this material.
Unsuitable Extinguishing Media: No data available.

6. Accidental Release Measures

Steps To Be Taken In Case Material Is Released Or Spilled: Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container. After removal, ventilate contaminated area and flush thoroughly with water.

7. Handling and Storage

Hazard Label Information: Avoid contact with skin and eyes. Do not reuse this container. Use with adequate ventilation. Wash thoroughly after handling.

Precautions To Be Taken in Handling: Avoid breathing (dust, vapor, mist, gas). Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure. Do not reuse this container. Use with adequate ventilation. Wash thoroughly after handling.

Precautions To Be Taken in Storing: Store at correct temperature.

8. Exposure Controls/Personal Protection

Protective Equipment Summary - Hazard Label Information: Eye wash station in work area Lab coat Latex disposable gloves Safety glasses Safety shower in work area Vent Hood

Respiratory Equipment (Specify Type): No data available.

Eye Protection: Safety glasses

Protective Gloves: Latex disposable gloves

Other Protective Clothing: Lab coat

Engineering Controls (Ventilation etc.): Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

Work/Hygienic/Maintenance Practices: Do not take internally. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Wash thoroughly after handling.

9. Physical and Chemical Properties

Physical States: [] Gas [X] Liquid [] Solid

Melting Point: No data.

Boiling Point: No data.

Autoignition Pt: No data.

Flash Pt: No data.

Explosive Limits: LEL: No data. UEL: No data.

Specific Gravity (Water = 1): No data.

Vapor Pressure (vs. Air or mm Hg): No data.

Vapor Density (vs. Air = 1): No data.

Evaporation Rate (vs Butyl Acetate=1): No data.

Solubility in Water: No data.

Percent Volatile: No data.

Corrosion Rate: No data.

pH: No data.

Appearance and Odor: A clear, colorless solution

10. Stability and Reactivity

Stability: Unstable [] Stable [X]

Conditions To Avoid - Instability: No data available.

Incompatibility - Materials To Avoid: strong oxidizing agents

Hazardous Decomposition Or Byproducts: carbon dioxide
carbon monoxide
nitrogen oxides

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Hazardous Polymerization: Will occur [] Will not occur [X]
Conditions To Avoid - Hazardous Polymerization: No data available.

11. Toxicological Information

: The toxicological effects of this compound have not been thoroughly studied.
Carcinogenicity/Other Information: No data available.
Carcinogenicity: NTP? No IARC Monographs? No OSHA Regulated? No

12. Ecological Information

: Runoff from fire control or dilution water may cause pollution.

13. Disposal Considerations

Waste Disposal Method: Dispose in accordance with local, state and federal regulations.

14. Transport Information

LAND TRANSPORT (US DOT)

DOT Proper Shipping Name: No data available.
Additional Transport Information: Transport in accordance with local, state, and federal regulations.

15. Regulatory Information

US EPA SARA Title III

Hazardous Components (Chemical Name)	CAS #	Sec.302 (EHS)	Sec.304 RQ	Sec.313 (TRI)	Sec.110
1. Trizma base	77-86-1	No	No	No	No
2. Water	7732-18-5	No	No	No	No

US EPA CAA, CWA, TSCA

Hazardous Components (Chemical Name)	CAS #	EPA CAA	EPA CWA NPDES	EPA TSCA	CA PROP 65
1. Trizma base	77-86-1	No	No	Inventory	No
2. Water	7732-18-5	No	No	Inventory	No

16. Other Information

Company Policy or Disclaimer

For research use only, not for human or veterinary clinical use.

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Heme

Cayman Chemical Company
1180 E. Ellsworth Rd.
Ann Arbor, MI 48108

Printed: 01/08/2009
Revision: 01/05/2009
Supersedes Revision: 01/28/2006
Date Created: 08/01/2001

1. Product and Company Identification

Product Code: 760156
Product Name: Heme
Manufacturer Information
Company Name: Cayman Chemical Company
Emergency Contact: Cayman Chemical Company (800)364-9897
Information: Cayman Chemical Company (734)971-3335

2. Composition/Information on Ingredients

Hazardous Components (Chemical Name)	CAS #	Concentration	OSHA PEL	ACGIH TLV	Other Limits
1. Hemin	16009-13-5	0.033 %	No data.	No data.	No data.
2. Dimethyl sulfoxide, anhydrous	67-68-5	99.967 %	No data.	No data.	No data.
Hazardous Components (Chemical Name)	RTECS #	OSHA STEL	OSHA CEIL	ACGIH STEL	ACGIH CEIL
1. Hemin	NA	No data.	No data.	No data.	No data.
2. Dimethyl sulfoxide, anhydrous	PV6210000	No data.	No data.	No data.	No data.

3. Hazards Identification

Emergency Overview: No data available.
Route(s) of Entry: Inhalation? Yes Skin? Yes Eyes? Yes Ingestion? Yes Other: Injection
Potential Health Effects (Acute and Chronic): The hazards identified with this product are those associated with the solvent(s). Avoid contact with DMSO solutions containing toxic materials or materials with unknown toxicological properties. Dimethyl sulfoxide is readily absorbed through skin and may carry such materials into the body.
Irritating to the skin, eyes, nose, throat, and respiratory tract.
Material may be irritating to the mucous membranes and upper respiratory tract.
May be harmful by inhalation, ingestion, or skin absorption.
May cause eye, skin, or respiratory system irritation.
The toxicological properties of this compound have not been fully evaluated.
LD 50 / LC 50: Please refer to Section 11.
Signs and Symptoms Of Exposure: Skin absorption of DMSO may result in a garlic-like breath and body odor, and CNS effects such as headache, nausea, and dizziness.
Ingestion may cause gastrointestinal irritation with nausea, vomiting, diarrhea, CNS effects, and a garlic smell on the breath and body.

4. First Aid Measures

Emergency and First Aid Procedures: If inhaled remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Get immediate medical attention.
If swallowed, wash out mouth with water provided person is conscious. Never give anything by mouth to an unconscious person. Get medical attention. Do NOT induce vomiting unless directed to do so by medical personnel.
In case of contact with eyes, hold eyelids apart and flush eyes with plenty of water. After initial flushings, remove any contact lenses and continue flushing for at least 20 minutes. Have eyes examined and tested by medical personnel.
In case of skin contact, immediately wash skin with soap and plenty of water. Remove contaminated clothing. Get medical attention if irritation develops and persists. Wash clothing before reuse.

5. Fire Fighting Measures

Flash Pt:	87.80 C Method Used: Closed Cup
Explosive Limits:	LEL: 2.6% at 25.0 C UEL: 42% at 25.0 C
Autoignition Pt:	215.00 C
Fire Fighting Instructions:	As in any fire, wear self-contained breathing apparatus pressure-demand (MSHA/NIOSH approved or equivalent), and full protective gear to prevent contact with skin and eyes. Note: combustible as diluted in dimethyl sulfoxide
Flammable Properties and Hazards:	Can release vapors that form explosive mixtures at temperatures at or above the flashpoint. Those vapors include formaldehyde, methyl mercaptan, and sulfur dioxide. Combustible liquid and vapor. Container explosion may occur under fire conditions. Emits toxic fumes under fire conditions. On mixing with potassium permanganate it will flash instantaneously. Reacts violently with other acids. Vapors can travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas.
Extinguishing Media:	Use alcohol-resistant foam, carbon dioxide, water, or dry chemical spray when fighting fires involving this material. Use water spray to keep fire-exposed containers cool.
Unsuitable Extinguishing Media:	No data available.

6. Accidental Release Measures

Steps To Be Taken In Case Material Is Released Or Spilled:	Wear a NIOSH/MSHA approved self-contained breathing apparatus and appropriate personal protection (rubber boots, safety goggles, and heavy rubber gloves). Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container. After removal, ventilate contaminated area and flush thoroughly with water. Avoid release into the environment - very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
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7. Handling and Storage

Hazard Label Information:	Avoid contact with skin and eyes. Do not reuse this container. Use with adequate ventilation. Wash thoroughly after handling.
Precautions To Be Taken in Handling:	Avoid breathing (dust, vapor, mist, gas). Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure. Do not reuse this container. Hygroscopic. Keep away from sources of ignition. Protect from moisture Use with adequate ventilation. Wash thoroughly after handling.
Precautions To Be Taken in Storing:	Keep away from sources of ignition. Keep away from incompatible substances. Keep tightly closed. Protect from moisture. Store at correct temperature.

8. Exposure Controls/Personal Protection

Protective Equipment Summary - Hazard Label Information:	Eye wash station in work area Lab coat Latex disposable gloves Safety glasses Safety shower in work area Vent Hood
Respiratory Equipment (Specify Type):	No data available.
Eye Protection:	Safety glasses

Heme

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Protective Gloves:	Latex disposable gloves
Other Protective Clothing:	Lab coat
Engineering Controls (Ventilation etc.):	Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.
Work/Hygienic/Maintenance Practices:	Do not take internally. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Wash thoroughly after handling.

9. Physical and Chemical Properties

Physical States:	<input type="checkbox"/> Gas <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Solid
Melting Point:	No data.
Boiling Point:	No data.
Autoignition Pt:	215.00 C
Flash Pt:	87.80 C Method Used: Closed Cup
Explosive Limits:	LEL: 2.6% at 25.0 C UEL: 42% at 25.0 C
Specific Gravity (Water = 1):	No data.
Vapor Pressure (vs. Air or mm Hg):	0.46 MM_HG at 20.0 C
Vapor Density (vs. Air = 1):	No data.
Evaporation Rate (vs Butyl Acetate=1):	No data.
Solubility in Water:	No data.
Percent Volatile:	No data.
Corrosion Rate:	No data.
pH:	No data.
Appearance and Odor:	A clear, colorless solution

10. Stability and Reactivity

Stability:	Unstable <input type="checkbox"/> Stable <input checked="" type="checkbox"/>
Conditions To Avoid - Instability:	protect from moisture
Incompatibility - Materials To Avoid:	strong oxidizing agents strong acids strong bases acid chlorides
Hazardous Decomposition Or Byproducts:	carbon monoxide carbon dioxide oxides of sulfur formaldehyde dimethyl sulfide
Hazardous Polymerization:	Will occur <input type="checkbox"/> Will not occur <input checked="" type="checkbox"/>
Conditions To Avoid - Hazardous Polymerization:	keep away from ignition sources
Polymerization:	protect from heat

11. Toxicological Information

:	The toxicological effects of this compound have not been thoroughly studied.
	DMSO - Toxicity Data:
	Oral (rat) LD50:14,500 mg/kg Skin (rat) LD50:40,000 mg/kg Oral (mouse) LD50:7,920 mg/kg
	Only select Registry of Toxic Effects of Chemical Substances (RTECS) data is presented here. See actual entry in RTECS for complete information.

Carcinogenicity/Other Information: No data available.
Carcinogenicity: NTP? No IARC Monographs? No OSHA Regulated? No

12. Ecological Information

: Avoid release into the environment - very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
 Runoff from fire control or dilution water may cause pollution.

13. Disposal Considerations

Waste Disposal Method: Dispose in accordance with local, state and federal regulations.

14. Transport Information

LAND TRANSPORT (US DOT)
DOT Proper Shipping Name Flammable liquids, n.o.s.
DOT Hazard Class: 3
DOT Hazard Label: FLAMMABLE LIQUID
UN/NA Number: UN1993
Packing Group: I
Additional Transport Information: Transport in accordance with local, state, and federal regulations.

15. Regulatory Information

US EPA SARA Title III

Hazardous Components (Chemical Name)	CAS #	Sec.302 (EHS)	Sec.304 RQ	Sec.313 (TRI)	Sec.110
1. Hemin	16009-13-5	No	No	No	No
2. Dimethyl sulfoxide, anhydrous	67-68-5	No	No	No	No

US EPA CAA, CWA, TSCA

Hazardous Components (Chemical Name)	CAS #	EPA CAA	EPA CWA NPDES	EPA TSCA	CA PROP 65
1. Hemin	16009-13-5	No	No	Inventory	No
2. Dimethyl sulfoxide, anhydrous	67-68-5	No	No	Inventory	No

16. Other Information

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MATERIAL SAFETY DATA SHEET

COX-FA COX Positive Control

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Cayman Chemical Company
1180 E. Ellsworth Rd.
Ann Arbor, MI 48108

Printed: 07/02/2009
Revision: 01/05/2009

Date Created: 01/05/2009

1. Product and Company Identification

Product Code: 700110
Product Name: COX-FA COX Positive Control
Manufacturer Information
Company Name: Cayman Chemical Company
Emergency Contact: Cayman Chemical Company (800)364-9897
Information: Cayman Chemical Company (734)971-3335
Chemical Family: Prostaglandins

2. Composition/Information on Ingredients

Hazardous Components (Chemical Name)	CAS #	Concentration	OSHA PEL	ACGIH TLV
1. COX-FA COX Positive Control	NA	100.0 %	No data.	No data.

3. Hazards Identification

Emergency Overview: No data available.
Route(s) of Entry: Inhalation? Yes Skin? Yes Eyes? Yes Ingestion? Yes Other: Injection
Potential Health Effects (Acute and Chronic): Material may be irritating to the mucous membranes and upper respiratory tract.
May be harmful by inhalation, ingestion, or skin absorption.
May cause eye, skin, or respiratory system irritation.
The toxicological properties of this compound have not been fully evaluated.
Signs and Symptoms Of Exposure: No data available.

4. First Aid Measures

Emergency and First Aid Procedures: If inhaled remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Get immediate medical attention.
If swallowed, wash out mouth with water provided person is conscious. Never give anything by mouth to an unconscious person. Get medical attention. Do NOT induce vomiting unless directed to do so by medical personnel.
In case of contact with eyes, hold eyelids apart and flush eyes with plenty of water. After initial flushings, remove any contact lenses and continue flushing for at least 20 minutes. Have eyes examined and tested by medical personnel.
In case of skin contact, immediately wash skin with soap and plenty of water. Remove contaminated clothing. Get medical attention if symptoms occur. Wash clothing before reuse.

5. Fire Fighting Measures

Flash Pt: No data.
Explosive Limits: LEL: No data. UEL: No data.
Fire Fighting Instructions: As in any fire, wear self-contained breathing apparatus pressure-demand (MSHA/NIOSH approved or equivalent), and full protective gear to prevent contact with skin and eyes.
Flammable Properties and Hazards: No data available.
Extinguishing Media: Use alcohol-resistant foam, carbon dioxide, water, or dry chemical spray when fighting fires involving this material.
Unsuitable Extinguishing Media: No data available.

6. Accidental Release Measures

Steps To Be Taken In Case Material Is Released Or Spilled: Wear a NIOSH/MSHA approved self-contained breathing apparatus and appropriate personal protection (rubber boots, safety goggles, and heavy rubber gloves).
Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container.
After removal, ventilate contaminated area and flush thoroughly with water.

Conditions To Avoid - Hazardous Polymerization: No data available.

11. Toxicological Information

: The toxicological effects of this compound have not been thoroughly studied.
Carcinogenicity/Other Information: No data available.
Carcinogenicity: NTP? No IARC Monographs? No OSHA Regulated? No

12. Ecological Information

: Runoff from fire control or dilution water may cause pollution.

13. Disposal Considerations

Waste Disposal Method: Dispose in accordance with local, state and federal regulations.

14. Transport Information

LAND TRANSPORT (US DOT)
DOT Proper Shipping Name No data available.
Additional Transport Information: Transport in accordance with local, state, and federal regulations.

15. Regulatory Information

US EPA SARA Title III

Hazardous Components (Chemical Name)	CAS #	Sec.302 (EHS)	Sec.304 RQ	Sec.313 (TRI)	Sec.110
1. COX-FA COX Positive Control	NA	No	No	No	

US EPA CAA, CWA, TSCA

Hazardous Components (Chemical Name)	CAS #	EPA CAA	EPA CWA NPDES	EPA TSCA	CA PROP 65
1. COX-FA COX Positive Control	NA	No		No	

16. Other Information

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MATERIAL SAFETY DATA SHEET

Arachidonic Acid

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Cayman Chemical Company
1180 E. Ellsworth Rd.
Ann Arbor, MI 48108

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Revision: 01/05/2009
Supersedes Revision: 01/28/2006
Date Created: 09/16/1999

1. Product and Company Identification

Product Code: 760153
Product Name: Arachidonic Acid
Manufacturer Information
Company Name: Cayman Chemical Company
Emergency Contact: Cayman Chemical Company (800)364-9897
Information: Cayman Chemical Company (734)971-3335
Chemical Family: EIA - Other

2. Composition/Information on Ingredients

Hazardous Components (Chemical Name)	CAS #	Concentration	OSHA PEL	ACGIH TLV	Other Limits
1. Arachidonic acid	506-32-1	0.67 %	No data.	No data.	No data.
2. Ethyl alcohol	64-17-5	99.33 %	8H TWA:1000ppm (1900 mg/m3)	No data.	No data.
Hazardous Components (Chemical Name)	RTECS #	OSHA STEL	OSHA CEIL	ACGIH STEL	ACGIH CEIL
1. Arachidonic acid	CE6675000	No data.	No data.	No data.	No data.
2. Ethyl alcohol	KQ6300000	No data.	No data.	No data.	No data.

3. Hazards Identification

Emergency Overview: No data available.

Route(s) of Entry: Inhalation? Yes Skin? Yes Eyes? Yes Ingestion? Yes Other: Injection

Potential Health Effects (Acute and Chronic): The hazards identified with this product are those associated with the solvent(s).
Long term repeated oral exposure to ethanol may result in the development of progressive liver injury with fibrosis.
Material is irritating to the mucous membranes and upper respiratory tract.
May be harmful by inhalation, ingestion, or skin absorption.
May cause eye, skin, or respiratory system irritation.
Repeated exposure may cause skin dryness or cracking.
Repeated ingestion of ethanol by pregnant mothers has been shown to adversely affect the CNS system of the fetus, producing a collection of effects which together constitute fetal alcohol syndrome. These include mental and physical retardation, disturbances of learning, motor and language deficiencies, behavioral disorders and small size head.
The toxicological properties of this compound have not been fully evaluated.

Signs and Symptoms Of Exposure: Exposure may cause: Dizziness, drowsiness, headache, nausea, and vomiting.

Medical Conditions Generally Aggravated By Exposure: Repeated exposure to ethanol may aggravate liver injury produced from other causes.

4. First Aid Measures

Emergency and First Aid Procedures: If inhaled remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Get immediate medical attention.
If swallowed, wash out mouth with water provided person is conscious. Never give anything by mouth to an unconscious person. Get medical attention. Do NOT induce vomiting unless directed to do so by medical personnel.
In case of contact with eyes, hold eyelids apart and flush eyes with plenty of water. After initial flushings, remove any contact lenses and continue flushing for at least 20 minutes. Have eyes examined and tested by medical personnel.
In case of skin contact, immediately wash skin with soap and plenty of water. Remove contaminated clothing. Get medical attention if symptoms occur. Wash clothing before reuse.

5. Fire Fighting Measures

Flash Pt:	14.00 C Method Used: TAG Closed Cup
Explosive Limits:	LEL: 3.3% at 25.0 C UEL: 19% at 25.0 C
Fire Fighting Instructions:	As in any fire, wear self-contained breathing apparatus pressure-demand (MSHA/NIOSH approved or equivalent), and full protective gear to prevent contact with skin and eyes. Note: Flammable as diluted in ethanol.
Flammable Properties and Hazards:	Can release vapors that form explosive mixtures at temperatures at or above the flashpoint. Container explosion may occur under fire conditions. Emits toxic fumes under fire conditions. Flammable liquid. Vapors can travel to a source of ignition and flash back.
Hazardous Combustion Products:	carbon dioxide carbon monoxide
Extinguishing Media:	Use alcohol-resistant foam, carbon dioxide, water, or dry chemical spray when fighting fires involving this material.
Unsuitable Extinguishing Media:	No data available.

6. Accidental Release Measures

Steps To Be Taken In Case Material Is Released Or Spilled:	Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container. After removal, ventilate contaminated area and flush thoroughly with water.
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7. Handling and Storage

Hazard Label Information:	Avoid contact with skin and eyes. Do not reuse this container. Use with adequate ventilation. Wash thoroughly after handling.
Precautions To Be Taken in Handling:	Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure. Do not reuse this container. Keep away from sources of ignition. Use with adequate ventilation. Wash thoroughly after handling.
Precautions To Be Taken in Storing:	Store at correct temperature.

8. Exposure Controls/Personal Protection

Protective Equipment Summary - Hazard Label Information:	Eye wash station in work area Lab coat Latex disposable gloves Safety glasses Safety shower in work area Vent Hood
Respiratory Equipment (Specify Type):	No data available.
Eye Protection:	Safety glasses
Protective Gloves:	Latex disposable gloves
Other Protective Clothing:	Lab coat
Engineering Controls (Ventilation etc.):	Good general ventilation should be sufficient to control airborne levels.
Work/Hygienic/Maintenance Practices:	Do not take internally. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Wash thoroughly after handling.

9. Physical and Chemical Properties

Physical States:	[] Gas [X] Liquid [] Solid
Melting Point:	No data.
Boiling Point:	No data.
Autoignition Pt:	No data.
Flash Pt:	14.00 C Method Used: TAG Closed Cup
Explosive Limits:	LEL: 3.3% at 25.0 C UEL: 19% at 25.0 C

Specific Gravity (Water = 1):	No data.
Vapor Pressure (vs. Air or mm Hg):	44.6 MM_HG at 20.0 C
Vapor Density (vs. Air = 1):	No data.
Evaporation Rate (vs Butyl Acetate=1):	No data.
Solubility in Water:	No data.
Percent Volatile:	No data.
Corrosion Rate:	No data.
pH:	No data.
Appearance and Odor:	A clear, colorless solution

10. Stability and Reactivity

Stability:	Unstable [] Stable [X]
Conditions To Avoid - Instability:	No data available.
Incompatibility - Materials To Avoid:	strong inorganic acids strong oxidizing agents
Hazardous Decomposition Or Byproducts:	carbon dioxide carbon monoxide
Hazardous Polymerization:	Will occur [] Will not occur [X]
Conditions To Avoid - Hazardous Polymerization:	No data available.

11. Toxicological Information

:	The toxicological effects of this compound have not been thoroughly studied.
Carcinogenicity/Other Information:	No data available.
Carcinogenicity:	NTP? No IARC Monographs? No OSHA Regulated? No

12. Ecological Information

:	Runoff from fire control or dilution water may cause pollution.
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13. Disposal Considerations

Waste Disposal Method:	Dispose in accordance with local, state and federal regulations.
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14. Transport Information

LAND TRANSPORT (US DOT)	
DOT Proper Shipping Name	Ethyl alcohol
DOT Hazard Class:	3
DOT Hazard Label:	FLAMMABLE LIQUID
UN/NA Number:	1170
Packing Group:	II
Additional Transport Information:	Transport in accordance with local, state, and federal regulations.

15. Regulatory Information

US EPA SARA Title III					
Hazardous Components (Chemical Name)	CAS #	Sec.302 (EHS)	Sec.304 RQ	Sec.313 (TRI)	Sec.110
1. Arachidonic acid	506-32-1	No	No	No	No
2. Ethyl alcohol	64-17-5	No	No	No	No
US EPA CAA, CWA, TSCA					
Hazardous Components (Chemical Name)	CAS #	EPA CAA	EPA CWA NPDES	EPA TSCA	CA PROP 65
1. Arachidonic acid	506-32-1	No	No	No	No
2. Ethyl alcohol	64-17-5	No	No	Inventory	No

16. Other Information

Company Policy or Disclaimer

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MATERIAL SAFETY DATA SHEET

Potassium Hydroxide

Page: 1

Cayman Chemical Company
1180 E. Ellsworth Rd.
Ann Arbor, MI 48108

Printed: 01/08/2009
Revision: 01/05/2009
Supersedes Revision: 01/28/2006
Date Created: 08/01/2001

1. Product and Company Identification

Product Code: 760155
Product Name: Potassium Hydroxide
Manufacturer Information
Company Name: Cayman Chemical Company
Emergency Contact: Cayman Chemical Company (800)364-9897
Information: Cayman Chemical Company (734)971-3335
Chemical Family: EIA - Other

2. Composition/Information on Ingredients

Hazardous Components (Chemical Name)	CAS #	Concentration	OSHA PEL	ACGIH TLV	Other Limits
1. Potassium hydroxide	1310-58-3	0.561 %	No data.	No data.	No data.
2. Water	7732-18-5	99.439 %	No data.	No data.	No data.
Hazardous Components (Chemical Name)	RTECS #	OSHA STEL	OSHA CEIL	ACGIH STEL	ACGIH CEIL
1. Potassium hydroxide	TT2100000	No data.	No data.	No data.	No data.
2. Water	ZC0110000	No data.	No data.	No data.	No data.

3. Hazards Identification

Emergency Overview: No data available.
Route(s) of Entry: Inhalation? Yes Skin? Yes Eyes? Yes Ingestion? Yes Other: Injection
Potential Health Effects (Acute and Chronic): Material may be irritating to the mucous membranes and upper respiratory tract.
May be harmful by inhalation, ingestion, or skin absorption.
May cause eye, skin, or respiratory system irritation.
The toxicological properties of this compound have not been fully evaluated.
Signs and Symptoms Of Exposure: No data available.

4. First Aid Measures

Emergency and First Aid Procedures: If inhaled remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Get immediate medical attention.
If swallowed, wash out mouth with water provided person is conscious. Never give anything by mouth to an unconscious person. Get medical attention. Do NOT induce vomiting unless directed to do so by medical personnel.
In case of contact with eyes, hold eyelids apart and flush eyes with plenty of water. After initial flushings, remove any contact lenses and continue flushing for at least 20 minutes. Have eyes examined and tested by medical personnel.
In case of skin contact, immediately wash skin with soap and plenty of water. Remove contaminated clothing. Get medical attention if symptoms occur. Wash clothing before reuse.

5. Fire Fighting Measures

Flash Pt: No data.
Explosive Limits: LEL: No data. UEL: No data.
Fire Fighting Instructions: As in any fire, wear self-contained breathing apparatus pressure-demand (MSHA/NIOSH approved or equivalent), and full protective gear to prevent contact with skin and eyes.
Flammable Properties and Hazards: No data available.
Extinguishing Media: Use alcohol-resistant foam, carbon dioxide, water, or dry chemical spray when fighting fires involving this material.
Unsuitable Extinguishing Media: No data available.

MATERIAL SAFETY DATA SHEET

Potassium Hydroxide

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Printed: 01/08/2009

Revision: 01/05/2009

Supercedes Revision: 01/28/2006

6. Accidental Release Measures

Steps To Be Taken In Case Material Is Released Or Spilled: Wear a self-contained breathing apparatus and appropriate personal protection (rubber boots, safety goggles, and heavy rubber gloves).
Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container.
After removal, ventilate contaminated area and flush thoroughly with water.

7. Handling and Storage

Hazard Label Information: Avoid contact with skin and eyes. Do not reuse this container. Use with adequate ventilation.
Wash thoroughly after handling.

Precautions To Be Taken in Handling: Avoid breathing (dust, vapor, mist, gas).
Avoid contact with eyes, skin, and clothing.
Avoid prolonged or repeated exposure.
Do not reuse this container.
Use with adequate ventilation.
Wash thoroughly after handling.

Precautions To Be Taken in Storing: Store at correct temperature.

8. Exposure Controls/Personal Protection

Protective Equipment Summary - Hazard Label Information: Eye wash station in work area Lab coat Latex disposable gloves Safety glasses Safety shower in work area Vent Hood

Respiratory Equipment (Specify Type): No data available.

Eye Protection: Safety glasses

Protective Gloves: Latex disposable gloves

Other Protective Clothing: Lab coat

Engineering Controls (Ventilation etc.): Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

Work/Hygienic/Maintenance Practices: Do not take internally.
Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.
Wash thoroughly after handling.

9. Physical and Chemical Properties

Physical States: [] Gas [X] Liquid [] Solid

Melting Point: No data.

Boiling Point: No data.

Autoignition Pt: No data.

Flash Pt: No data.

Explosive Limits: LEL: No data. UEL: No data.

Specific Gravity (Water = 1): No data.

Vapor Pressure (vs. Air or mm Hg): No data.

Vapor Density (vs. Air = 1): No data.

Evaporation Rate (vs Butyl Acetate=1): No data.

Solubility in Water: No data.

Percent Volatile: No data.

Corrosion Rate: No data.

pH: No data.

Appearance and Odor: A clear, colorless solution

10. Stability and Reactivity

Stability: Unstable [] Stable [X]

Conditions To Avoid - Instability: No data available.

Incompatibility - Materials To Avoid: No data available.

MATERIAL SAFETY DATA SHEET

Potassium Hydroxide

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 Supersedes Revision: 01/28/2006

Hazardous Decomposition Or Byproducts: No data available.
Hazardous Polymerization: Will occur [] Will not occur [X]
Conditions To Avoid - Hazardous Polymerization: No data available.

11. Toxicological Information

: The toxicological effects of this compound have not been thoroughly studied.
Carcinogenicity/Other Information: No data available.
Carcinogenicity: NTP? No IARC Monographs? No OSHA Regulated? No

12. Ecological Information

: Runoff from fire control or dilution water may cause pollution.

13. Disposal Considerations

Waste Disposal Method: Dispose in accordance with local, state and federal regulations.

14. Transport Information

LAND TRANSPORT (US DOT)
DOT Proper Shipping Name: No data available.
Additional Transport Information: Transport in accordance with local, state, and federal regulations.

15. Regulatory Information

US EPA SARA Title III

Hazardous Components (Chemical Name)	CAS #	Sec.302 (EHS)	Sec.304 RQ	Sec.313 (TRI)	Sec.110
1. Potassium hydroxide	1310-58-3	No	Yes 1000 LB	No	No
2. Water	7732-18-5	No	No	No	No

US EPA CAA, CWA, TSCA

Hazardous Components (Chemical Name)	CAS #	EPA CAA	EPA CWA NPDES	EPA TSCA	CA PROP 65
1. Potassium hydroxide	1310-58-3	No	No	Inventory	No
2. Water	7732-18-5	No	No	Inventory	No

16. Other Information

Company Policy or Disclaimer

For research use only, not for human or veterinary clinical use.
 DISCLAIMER: This information is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes.

MATERIAL SAFETY DATA SHEET

COX-FA Fluorometric Substrate

Page: 1

Cayman Chemical Company
1180 E. Ellsworth Rd.
Ann Arbor, MI 48108

Printed: 01/08/2009
Revision: 01/05/2009

Date Created: 01/05/2009

1. Product and Company Identification

Product Code: 700113
Product Name: COX-FA Fluorometric Substrate
Manufacturer Information
Company Name: Cayman Chemical Company
Emergency Contact: Cayman Chemical Company (800)364-9897
Information: Cayman Chemical Company (734)971-3335

2. Composition/Information on Ingredients

Hazardous Components (Chemical Name)	CAS #	Concentration	OSHA PEL	ACGIH TLV
1. COX-FA Fluorometric Substrate	NA	100.0 %	No data.	No data.

3. Hazards Identification

Emergency Overview: No data available.
Route(s) of Entry: Inhalation? Yes Skin? Yes Eyes? Yes Ingestion? Yes Other: Injection
Potential Health Effects (Acute and Chronic): Avoid contact with solutions containing toxic materials or materials with unknown toxicological properties.
Readily absorbed through skin and may carry such materials into the body.
Irritating to the skin, eyes, nose, throat, and respiratory tract.
Material may be irritating to the mucous membranes and upper respiratory tract.
May be harmful by inhalation, ingestion, or skin absorption.
May cause eye, skin, or respiratory system irritation.
The toxicological properties of this compound have not been fully evaluated.
LD 50 / LC 50: Please refer to Section 11
Signs and Symptoms Of Exposure: Skin absorption may result in a garlic-like breath and body odor, and CNS effects such as headache, nausea, and dizziness.
Ingestion may cause gastrointestinal irritation with nausea, vomiting, diarrhea, CNS effects, and a garlic smell on the breath and body.

4. First Aid Measures

Emergency and First Aid Procedures: If inhaled remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Get immediate medical attention.
If swallowed, wash out mouth with water provided person is conscious. Never give anything by mouth to an unconscious person. Get medical attention. Do NOT induce vomiting unless directed to do so by medical personnel.
In case of contact with eyes, hold eyelids apart and flush eyes with plenty of water. After initial flushings, remove any contact lenses and continue flushing for at least 20 minutes. Have eyes examined and tested by medical personnel.
In case of skin contact, immediately wash skin with soap and plenty of water. Remove contaminated clothing. Get medical attention if symptoms occur. Wash clothing before reuse.

5. Fire Fighting Measures

Flash Pt: 87.80 C Method Used: Closed Cup
Explosive Limits: LEL: 2.6% at 25.0 C UEL: 42% at 25.0 C
Autoignition Pt: 215.00 C
Fire Fighting Instructions: As in any fire, wear self-contained breathing apparatus pressure-demand (MSHA/NIOSH approved or equivalent), and full protective gear to prevent contact with skin and eyes.
Note: combustible as diluted in dimethyl sulfoxide

Flammable Properties and Hazards:	<p>Can release vapors that form explosive mixtures at temperatures at or above the flashpoint. Those vapors include formaldehyde, methyl mercaptan, and sulfur dioxide.</p> <p>Combustible liquid and vapor.</p> <p>Container explosion may occur under fire conditions.</p> <p>Emits toxic fumes under fire conditions.</p> <p>On mixing with potassium permanganate it will flash instantaneously.</p> <p>Reacts violently with other acids.</p> <p>Vapors can travel to a source of ignition and flash back.</p> <p>Vapors can spread along the ground and collect in low or confined areas.</p>
Extinguishing Media:	<p>Use alcohol-resistant foam, carbon dioxide, water, or dry chemical spray when fighting fires involving this material.</p> <p>Use water spray to keep fire-exposed containers cool.</p>
Unsuitable Extinguishing Media:	No data available.

6. Accidental Release Measures

Steps To Be Taken In Case Material Is Released Or Spilled:	<p>Wear a NIOSH/MSHA approved self-contained breathing apparatus and appropriate personal protection (rubber boots, safety goggles, and heavy rubber gloves).</p> <p>Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container.</p> <p>After removal, ventilate contaminated area and flush thoroughly with water.</p> <p>Avoid release into the environment - very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.</p>
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7. Handling and Storage

Hazard Label Information:	<p>Avoid contact with skin and eyes. Do not reuse this container. Use with adequate ventilation.</p> <p>Wash thoroughly after handling.</p>
Precautions To Be Taken in Handling:	<p>Avoid breathing (dust, vapor, mist, gas).</p> <p>Avoid contact with eyes, skin, and clothing.</p> <p>Avoid prolonged or repeated exposure.</p> <p>Do not reuse this container.</p> <p>Hygroscopic.</p> <p>Keep away from sources of ignition.</p> <p>Use with adequate ventilation.</p> <p>Wash thoroughly after handling.</p>
Precautions To Be Taken in Storing:	<p>Keep away from sources of ignition.</p> <p>Keep away from incompatible substances.</p> <p>Keep tightly closed.</p> <p>Protect from moisture.</p> <p>Store at correct temperature.</p>

8. Exposure Controls/Personal Protection

Protective Equipment Summary - Hazard Label Information:	<p>Eye wash station in work area Lab coat Latex disposable gloves Safety glasses Safety shower in work area Vent Hood</p>
Respiratory Equipment (Specify Type):	No data available.
Eye Protection:	Safety glasses
Protective Gloves:	Latex disposable gloves
Other Protective Clothing:	Lab coat
Engineering Controls (Ventilation etc.):	Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.
Work/Hygienic/Maintenance Practices:	<p>Do not take internally.</p> <p>Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.</p> <p>Wash thoroughly after handling.</p>

COX-FA Fluorometric Substrate

Printed: 01/08/2009

Revision: 01/05/2009

9. Physical and Chemical Properties

Physical States:	[] Gas [X] Liquid [] Solid
Melting Point:	No data.
Boiling Point:	No data.
Autoignition Pt:	215.00 C
Flash Pt:	87.80 C Method Used: Closed Cup
Explosive Limits:	LEL: 2.6% at 25.0 C UEL: 42% at 25.0 C
Specific Gravity (Water = 1):	No data.
Vapor Pressure (vs. Air or mm Hg):	0.46 MM_HG at 20.0 C
Vapor Density (vs. Air = 1):	No data.
Evaporation Rate (vs Butyl Acetate=1):	No data.
Solubility in Water:	No data.
Percent Volatile:	No data.
Corrosion Rate:	No data.
pH:	No data.
Appearance and Odor:	A clear, colorless solution

10. Stability and Reactivity

Stability:	Unstable [] Stable [X]
Conditions To Avoid - Instability:	protect from moisture
Incompatibility - Materials To Avoid:	strong oxidizing agents strong acids strong bases acid chlorides
Hazardous Decomposition Or Byproducts:	carbon monoxide carbon dioxide oxides of sulfur formaldehyde dimethyl sulfide
Hazardous Polymerization:	Will occur [] Will not occur [X]
Conditions To Avoid - Hazardous Polymerization:	keep away from ignition sources
Polymerization:	protect from heat

11. Toxicological Information

:	The toxicological effects of this compound have not been thoroughly studied.
	Toxicity Data:
	Oral (rat) LD50:14,500 mg/kg
	Skin (rat) LD50:40,000 mg/kg
	Oral (mouse) LD50:7,920 mg/kg
Carcinogenicity/Other Information:	No data available.
Carcinogenicity:	NTP? No IARC Monographs? No OSHA Regulated? No

12. Ecological Information

:	Avoid release into the environment - very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Runoff from fire control or dilution water may cause pollution.
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MATERIAL SAFETY DATA SHEET
COX-FA Fluorometric Substrate

13. Disposal Considerations

Waste Disposal Method: Dispose in accordance with local, state and federal regulations.

14. Transport Information

LAND TRANSPORT (US DOT)

DOT Proper Shipping Name Flammable liquids, n.o.s.

DOT Hazard Class: 3

DOT Hazard Label: FLAMMABLE LIQUID

UN/NA Number: UN1993

Packing Group: I

Additional Transport Information: Transport in accordance with local, state, and federal regulations.

15. Regulatory Information

US EPA SARA Title III

Hazardous Components (Chemical Name)	CAS #	Sec.302 (EHS)	Sec.304 RQ	Sec.313 (TRI)	Sec.110
1. COX-FA Fluorometric Substrate	NA	No	No	No	No

US EPA CAA, CWA, TSCA

Hazardous Components (Chemical Name)	CAS #	EPA CAA	EPA CWA NPDES	EPA TSCA	CA PROP 65
1. COX-FA Fluorometric Substrate	NA	No	No	No	No

16. Other Information

Company Policy or Disclaimer

For research use only, not for human or veterinary clinical use.

DISCLAIMER: This information is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes.

MATERIAL SAFETY DATA SHEET

DuP-697 Assay Reagent

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Cayman Chemical Company
1180 E. Ellsworth Rd.
Ann Arbor, MI 48108

Printed: 09/17/2009
Revision: 09/15/2009
Supersedes Revision: 01/07/2009
Date Created: 08/01/2001

1. Product and Company Identification

Product Code: 760158
Product Name: DuP-697 Assay Reagent
Manufacturer Information
Company Name: Cayman Chemical Company
Emergency Contact: Cayman Chemical Company (800)364-9897
Information: Cayman Chemical Company (734)971-3335

2. Composition/Information on Ingredients

Hazardous Components (Chemical Name)	CAS #	Concentration	OSHA PEL	ACGIH TLV	Other Limits
1. DuP-697	88149-94-4	0.25 %	No data.	No data.	No data.
2. Dimethyl sulfoxide, anhydrous	67-68-5	99.75 %	No data.	No data.	No data.

Hazardous Components (Chemical Name)	RTECS #	OSHA STEL	OSHA CEIL	ACGIH STEL	ACGIH CEIL
1. DuP-697	NA	No data.	No data.	No data.	No data.
2. Dimethyl sulfoxide, anhydrous	PV6210000	No data.	No data.	No data.	No data.

3. Hazards Identification

Emergency Overview: No data available.

Route(s) of Entry: Inhalation? Yes Skin? Yes Eyes? Yes Ingestion? Yes Other: Injection

Potential Health Effects (Acute and Chronic): The hazards identified with this product are those associated with the solvent(s). Avoid contact with DMSO solutions containing toxic materials or materials with unknown toxicological properties. Dimethyl sulfoxide is readily absorbed through skin and may carry such materials into the body.

Irritating to the skin, eyes, nose, throat, and respiratory tract.
Material may be irritating to the mucous membranes and upper respiratory tract.
May be harmful by inhalation, ingestion, or skin absorption.
May cause eye, skin, or respiratory system irritation.
The toxicological properties of this compound have not been fully evaluated.

LD 50 / LC 50: Please refer to Section 11.

Signs and Symptoms Of Exposure: Skin absorption of DMSO may result in a garlic-like breath and body odor, and CNS effects such as headache, nausea, and dizziness.
Ingestion may cause gastrointestinal irritation with nausea, vomiting, diarrhea, CNS effects, and a garlic smell on the breath and body.

4. First Aid Measures

Emergency and First Aid Procedures:

If inhaled remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Get immediate medical attention.

If swallowed, wash out mouth with water provided person is conscious. Never give anything by mouth to an unconscious person. Get medical attention. Do NOT induce vomiting unless directed to do so by medical personnel.

In case of contact with eyes, hold eyelids apart and flush eyes with plenty of water. After initial flushings, remove any contact lenses and continue flushing for at least 20 minutes. Have eyes examined and tested by medical personnel.

In case of skin contact, immediately wash skin with soap and plenty of water. Remove contaminated clothing. Get medical attention if symptoms occur. Wash clothing before reuse.

5. Fire Fighting Measures

Flash Pt:	87.00 C Method Used: Closed Cup
Explosive Limits:	LEL: 3.5% at 25.0 C UEL: 42% at 25.0 C
Autoignition Pt:	301.00 C
Fire Fighting Instructions:	As in any fire, wear self-contained breathing apparatus pressure-demand (MSHA/NIOSH approved or equivalent), and full protective gear to prevent contact with skin and eyes. Note: combustible as diluted in dimethyl sulfoxide
Flammable Properties and Hazards:	Can release vapors that form explosive mixtures at temperatures at or above the flashpoint. Those vapors include formaldehyde, methyl mercaptan, and sulfur dioxide. Combustible liquid. Container explosion may occur under fire conditions. Emits toxic fumes under fire conditions. May cause exothermic reaction when combined with certain chemicals. On mixing with potassium permanganate it will flash instantaneously. Reacts violently with other acids. Vapors can travel to a source of ignition and flash back.
Extinguishing Media:	Use alcohol-resistant foam, carbon dioxide, water, or dry chemical spray when fighting fires involving this material.
Unsuitable Extinguishing Media:	No data available.

6. Accidental Release Measures

Steps To Be Taken In Case Material Is Released Or Spilled:	Wear a NIOSH/MSHA approved self-contained breathing apparatus and appropriate personal protection (rubber boots, safety goggles, and heavy rubber gloves). Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container. After removal, ventilate contaminated area and flush thoroughly with water. Avoid release into the environment - very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
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7. Handling and Storage

Hazard Label Information:	Avoid contact with skin and eyes. Do not reuse this container. Use with adequate ventilation. Wash thoroughly after handling.
Precautions To Be Taken in Handling:	Avoid breathing (dust, vapor, mist, gas). Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure. Do not reuse this container. Hygroscopic. Keep away from sources of ignition. Use with adequate ventilation. Wash thoroughly after handling.
Precautions To Be Taken in Storing:	Keep away from sources of ignition. Keep away from incompatible substances. Keep tightly closed. Protect from moisture. Store at correct temperature.

8. Exposure Controls/Personal Protection

Protective Equipment Summary - Hazard Label Information:	Eye wash station in work area Lab coat Compatible chemical-resistant gloves Safety glasses Safety shower in work area Vent Hood
Respiratory Equipment (Specify Type):	No data available.
Eye Protection:	Safety glasses
Protective Gloves:	Latex disposable gloves
Other Protective Clothing:	Lab coat

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DuP-697 Assay Reagent

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Printed: 09/17/2009

Revision: 09/15/2009

Supersedes Revision: 01/07/2009

Engineering Controls (Ventilation etc.):	Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.
Work/Hygienic/Maintenance Practices:	Do not take internally. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Wash thoroughly after handling.

9. Physical and Chemical Properties

Physical States:	[] Gas [X] Liquid [] Solid
Melting Point:	No data.
Boiling Point:	No data.
Autoignition Pt:	301.00 C
Flash Pt:	87.00 C Method Used: Closed Cup
Explosive Limits:	LEL: 3.5% at 25.0 C UEL: 42% at 25.0 C
Specific Gravity (Water = 1):	No data.
Bulk density:	No data.
Vapor Pressure (vs. Air or mm Hg):	0.42 MM_HG at 20.0 C
Vapor Density (vs. Air = 1):	No data.
Evaporation Rate (vs Butyl Acetate=1):	No data.
Solubility in Water:	No data.
Percent Volatile:	N.A.
Heat Value:	No data.
Particle Size:	No data.
Corrosion Rate:	No data.
Formula:	C17H12BrFO2S2
Molecular Weight:	411.30
pH:	No data.
Appearance and Odor:	A clear, colorless solution

10. Stability and Reactivity

Stability:	Unstable [] Stable [X]
Conditions To Avoid - Instability:	protect from moisture
Incompatibility - Materials To Avoid:	strong oxidizing agents strong acids strong bases acid chlorides
Hazardous Decomposition Or Byproducts:	carbon monoxide carbon dioxide oxides of sulfur formaldehyde dimethyl sulfide
Hazardous Polymerization:	Will occur [] Will not occur [X]
Conditions To Avoid - Hazardous Polymerization:	No data available.

11. Toxicological Information

: The toxicological effects of this compound have not been thoroughly studied.

DMSO
Toxicity Data:
Oral LD50 (rat): 14,500 mg/kg
Oral LD50 (mouse): 7,920 mg/kg
Skin LD50 (rat): 40,000 mg/kg
Inhalation LC50 (rat): 40250 ppm/4h
Irritation Data:
Eyes (rabbit): 500 mg/24h mild

MATERIAL SAFETY DATA SHEET

DuP-697 Assay Reagent

Page: 4

Printed: 09/17/2009

Revision: 09/15/2009

Supercedes Revision: 01/07/2009

Skin (rabbit): 500 mg/24h mild

Carcinogenicity/Other Information:

No data available.

Carcinogenicity:

NTP? No IARC Monographs? No OSHA Regulated? No

12. Ecological Information

: Avoid release into the environment - very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Runoff from fire control or dilution water may cause pollution.

13. Disposal Considerations

Waste Disposal Method:

Dispose in accordance with local, state and federal regulations.

14. Transport Information

LAND TRANSPORT (US DOT)

DOT Proper Shipping Name Flammable liquids, n.o.s. (Dimethyl sulfoxide solution)
DOT Hazard Class: 3
DOT Hazard Label: FLAMMABLE LIQUID
UN/NA Number: UN1993
Packing Group: III

AIR TRANSPORT (ICAO/IATA)

ICAO/IATA Proper Shipping Name Flammable liquids, n.o.s. (Dimethyl sulfoxide solution)
UN Number: 1993
Packing Group: III
IATA Classification: 3

Additional Transport Information:

According to IATA Regulations, this product ships as an excepted quantity.
Transport in accordance with local, state, and federal regulations.

15. Regulatory Information

US EPA SARA Title III

Hazardous Components (Chemical Name)	CAS #	Sec.302 (EHS)	Sec.304 RQ	Sec.313 (TRI)	Sec.110
1. DuP-697	88149-94-4	No	No	No	
2. Dimethyl sulfoxide, anhydrous	67-68-5	No	No	No	

US EPA CAA, CWA, TSCA

Hazardous Components (Chemical Name)	CAS #	EPA CAA	EPA CWA NPDES	EPA TSCA	CA PROP 65
1. DuP-697	88149-94-4	No		No	
2. Dimethyl sulfoxide, anhydrous	67-68-5	No		Inventory	

16. Other Information

Company Policy or Disclaimer

For research use only, not for human or veterinary clinical use.

DISCLAIMER: This information is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes.

MATERIAL SAFETY DATA SHEET

SC-560 Assay Reagent

Page: 1

Cayman Chemical Company
1180 E. Ellsworth Rd.
Ann Arbor, MI 48108

Printed: 09/17/2009
Revision: 09/15/2009
Supersedes Revision: 01/07/2009
Date Created: 08/01/2001

1. Product and Company Identification

Product Code: 760159
Product Name: SC-560 Assay Reagent
Manufacturer Information
Company Name: Cayman Chemical Company
Emergency Contact: Cayman Chemical Company (800)364-9897
Information: Cayman Chemical Company (734)971-3335

2. Composition/Information on Ingredients

Hazardous Components (Chemical Name)	CAS #	Concentration	OSHA PEL	ACGIH TLV	Other Limits
1. SC-560	188817-13-2	0.25 %	No data.	No data.	No data.
2. Dimethyl sulfoxide, anhydrous	67-68-5	99.75 %	No data.	No data.	No data.

Hazardous Components (Chemical Name)	RTECS #	OSHA STEL	OSHA CEIL	ACGIH STEL	ACGIH CEIL
1. SC-560	NA	No data.	No data.	No data.	No data.
2. Dimethyl sulfoxide, anhydrous	PV6210000	No data.	No data.	No data.	No data.

3. Hazards Identification

Emergency Overview: No data available.

Route(s) of Entry: Inhalation? Yes Skin? Yes Eyes? Yes Ingestion? Yes Other: Injection

Potential Health Effects (Acute and Chronic): The hazards identified with this product are those associated with the solvent(s). Avoid contact with DMSO solutions containing toxic materials or materials with unknown toxicological properties. Dimethyl sulfoxide is readily absorbed through skin and may carry such materials into the body.

Irritating to the skin, eyes, nose, throat, and respiratory tract.
Material may be irritating to the mucous membranes and upper respiratory tract.
May be harmful by inhalation, ingestion, or skin absorption.
May cause eye, skin, or respiratory system irritation.
The toxicological properties of this compound have not been fully evaluated.

LD 50 / LC 50: Please refer to Section 11.

Signs and Symptoms Of Exposure: Skin absorption of DMSO may result in a garlic-like breath and body odor, and CNS effects such as headache, nausea, and dizziness.
Ingestion may cause gastrointestinal irritation with nausea, vomiting, diarrhea, CNS effects, and a garlic smell on the breath and body.

4. First Aid Measures

Emergency and First Aid Procedures:

If inhaled remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Get immediate medical attention.

If swallowed, wash out mouth with water provided person is conscious. Never give anything by mouth to an unconscious person. Get medical attention. Do NOT induce vomiting unless directed to do so by medical personnel.

In case of contact with eyes, hold eyelids apart and flush eyes with plenty of water. After initial flushings, remove any contact lenses and continue flushing for at least 20 minutes. Have eyes examined and tested by medical personnel.

In case of skin contact, immediately wash skin with soap and plenty of water. Remove contaminated clothing. Get medical attention if symptoms occur. Wash clothing before reuse.

MATERIAL SAFETY DATA SHEET
SC-560 Assay Reagent

Page: 2
Printed: 09/17/2009
Revision: 09/15/2009
Supersedes Revision: 01/07/2009

5. Fire Fighting Measures

Flash Pt:	87.00 C Method Used: Closed Cup
Explosive Limits:	LEL: 3.5% at 25.0 C UEL: 42% at 25.0 C
Autoignition Pt:	301.00 C
Fire Fighting Instructions:	As in any fire, wear self-contained breathing apparatus pressure-demand (MSHA/NIOSH approved or equivalent), and full protective gear to prevent contact with skin and eyes. Note: combustible as diluted in dimethyl sulfoxide
Flammable Properties and Hazards:	Can release vapors that form explosive mixtures at temperatures at or above the flashpoint. Those vapors include formaldehyde, methyl mercaptan, and sulfur dioxide. Combustible liquid. Container explosion may occur under fire conditions. Emits toxic fumes under fire conditions. May cause exothermic reaction when combined with certain chemicals. On mixing with potassium permanganate it will flash instantaneously. Reacts violently with other acids. Vapors can travel to a source of ignition and flash back.
Extinguishing Media:	Use alcohol-resistant foam, carbon dioxide, water, or dry chemical spray when fighting fires involving this material. Use water spray to keep fire-exposed containers cool.
Unsuitable Extinguishing Media:	No data available.

6. Accidental Release Measures

Steps To Be Taken In Case Material Is Released Or Spilled:	Wear appropriate personal protection (rubber boots, safety goggles, and heavy rubber gloves). Wear government approved (NIOSH/MSHA) respirator as conditions warrant. Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container. After removal, ventilate contaminated area and flush thoroughly with water. Avoid release into the environment - very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
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7. Handling and Storage

Hazard Label Information:	Avoid contact with skin and eyes. Do not reuse this container. Use with adequate ventilation. Wash thoroughly after handling.
Precautions To Be Taken in Handling:	Avoid breathing (dust, vapor, mist, gas). Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure. Do not reuse this container. Hygroscopic. Keep away from sources of ignition. Use with adequate ventilation. Wash thoroughly after handling.
Precautions To Be Taken in Storing:	Keep away from sources of ignition. Keep away from incompatible substances. Keep tightly closed. Protect from moisture. Store at correct temperature.

8. Exposure Controls/Personal Protection

Protective Equipment Summary - Hazard Label Information:	Eye wash station in work area Lab coat Compatible chemical-resistant gloves Safety glasses Safety shower in work area Vent Hood
Respiratory Equipment (Specify Type):	No data available.
Eye Protection:	Safety glasses
Protective Gloves:	Compatible chemical-resistant gloves

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SC-560 Assay Reagent

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Revision: 09/15/2009

Supercedes Revision: 01/07/2009

Other Protective Clothing:	Lab coat
Engineering Controls (Ventilation etc.):	Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.
Work/Hygienic/Maintenance Practices:	Do not take internally. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Wash thoroughly after handling.

9. Physical and Chemical Properties

Physical States:	[] Gas [X] Liquid [] Solid
Melting Point:	No data.
Boiling Point:	No data.
Autoignition Pt:	301.00 C
Flash Pt:	87.00 C Method Used: Closed Cup
Explosive Limits:	LEL: 3.5% at 25.0 C UEL: 42% at 25.0 C
Specific Gravity (Water = 1):	No data.
Bulk density:	No data.
Vapor Pressure (vs. Air or mm Hg):	0.46 MM_HG at 20.0 C
Vapor Density (vs. Air = 1):	No data.
Evaporation Rate (vs Butyl Acetate=1):	No data.
Solubility in Water:	No data.
Percent Volatile:	N.A.
Heat Value:	No data.
Particle Size:	No data.
Corrosion Rate:	No data.
Formula:	C17H12ClF3N2O
Molecular Weight:	352.70
pH:	No data.
Appearance and Odor:	A clear, colorless solution

10. Stability and Reactivity

Stability:	Unstable [] Stable [X]
Conditions To Avoid - Instability:	protect from moisture
Incompatibility - Materials To Avoid:	strong oxidizing agents strong acids strong bases acid chlorides
Hazardous Decomposition Or Byproducts:	carbon monoxide carbon dioxide oxides of sulfur formaldehyde dimethyl sulfide
Hazardous Polymerization:	Will occur [] Will not occur [X]
Conditions To Avoid - Hazardous Polymerization:	No data available.

11. Toxicological Information

: The toxicological effects of this compound have not been thoroughly studied.

DMSO

Toxicity Data:

Oral LD50 (rat): 14,500 mg/kg

Oral LD50 (mouse): 7,920 mg/kg

Skin LD50 (rat): 40,000 mg/kg

Inhalation LC50 (rat): 40250 ppm/4h

Irritation Data:

MATERIAL SAFETY DATA SHEET

SC-560 Assay Reagent

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 Revision: 09/15/2009
 Supercedes Revision: 01/07/2009

Eyes (rabbit): 500 mg/24h mild
 Skin (rabbit): 500 mg/24h mild

Carcinogenicity/Other Information: No data available.
Carcinogenicity: NTP? No IARC Monographs? No OSHA Regulated? No

12. Ecological Information

: Avoid release into the environment - very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
 Runoff from fire control or dilution water may cause pollution.

13. Disposal Considerations

Waste Disposal Method: Dispose in accordance with local, state and federal regulations.

14. Transport Information

LAND TRANSPORT (US DOT)

DOT Proper Shipping Name: Flammable liquids, n.o.s. (Dimethyl sulfoxide solution)
DOT Hazard Class: 3
DOT Hazard Label: FLAMMABLE LIQUID
UN/NA Number: UN1993
Packing Group: III

AIR TRANSPORT (ICAO/IATA)

ICAO/IATA Proper Shipping Name: Flammable liquids, n.o.s. (Dimethyl sulfoxide solution)
UN Number: 1993
Packing Group: III
IATA Classification: 3

Additional Transport Information: According to IATA Regulations, this product ships as an excepted quantity.
 Transport in accordance with local, state, and federal regulations.

15. Regulatory Information

US EPA SARA Title III

Hazardous Components (Chemical Name)	CAS #	Sec.302 (EHS)	Sec.304 RQ	Sec.313 (TRI)	Sec.110
1. SC-560	188817-13-2	No	No	No	
2. Dimethyl sulfoxide, anhydrous	67-68-5	No	No	No	

US EPA CAA, CWA, TSCA

Hazardous Components (Chemical Name)	CAS #	EPA CAA	EPA CWA NPDES	EPA TSCA	CA PROP 65
1. SC-560	188817-13-2	No		No	
2. Dimethyl sulfoxide, anhydrous	67-68-5	No		Inventory	

16. Other Information

Company Policy or Disclaimer

For research use only, not for human or veterinary clinical use.

DISCLAIMER: This information is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes.

MATERIAL SAFETY DATA SHEET

COX-FA Dimethylsulfoxide

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Cayman Chemical Company
1180 E. Ellsworth Rd.
Ann Arbor, MI 48108

Printed: 01/08/2009
Revision: 01/05/2009

Date Created: 01/05/2009

1. Product and Company Identification

Product Code: 700111
Product Name: COX-FA Dimethylsulfoxide
Manufacturer Information
Company Name: Cayman Chemical Company
Emergency Contact: Cayman Chemical Company (800)364-9897
Information: Cayman Chemical Company (734)971-3335

2. Composition/Information on Ingredients

Hazardous Components (Chemical Name)	CAS #	Concentration	OSHA PEL	ACGIH TLV	Other Limits
1. Dimethyl sulfoxide, anhydrous	67-68-5	100.0 %	No data.	No data.	No data.
Hazardous Components (Chemical Name)	RTECS #	OSHA STEL	OSHA CEIL	ACGIH STEL	ACGIH CEIL
1. Dimethyl sulfoxide, anhydrous	PV6210000	No data.	No data.	No data.	No data.

3. Hazards Identification

Emergency Overview: No data available.

Route(s) of Entry: Inhalation? Yes Skin? Yes Eyes? Yes Ingestion? Yes Other: Injection

Potential Health Effects (Acute and Chronic): Avoid contact with DMSO solutions containing toxic materials or materials with unknown toxicological properties. Dimethyl sulfoxide is readily absorbed through skin and may carry such materials into the body.
Irritating to the skin, eyes, nose, throat, and respiratory tract.
Material may be irritating to the mucous membranes and upper respiratory tract.
May be harmful by inhalation, ingestion, or skin absorption.
May cause eye, skin, or respiratory system irritation.
The toxicological properties of this compound have not been fully evaluated.

LD 50 / LC 50: Please refer to Section 11

Signs and Symptoms Of Exposure: Skin absorption of DMSO may result in a garlic-like breath and body odor, and CNS effects such as headache, nausea, and dizziness.
Ingestion may cause gastrointestinal irritation with nausea, vomiting, diarrhea, CNS effects, and a garlic smell on the breath and body.

4. First Aid Measures

Emergency and First Aid Procedures: If inhaled remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Get immediate medical attention.
If swallowed, wash out mouth with water provided person is conscious. Never give anything by mouth to an unconscious person. Get medical attention. Do NOT induce vomiting unless directed to do so by medical personnel.
In case of contact with eyes, hold eyelids apart and flush eyes with plenty of water. After initial flushings, remove any contact lenses and continue flushing for at least 20 minutes. Have eyes examined and tested by medical personnel.
In case of skin contact, immediately wash skin with soap and plenty of water. Remove contaminated clothing. Get medical attention if symptoms occur. Wash clothing before reuse.

5. Fire Fighting Measures

Flash Pt: 87.80 C Method Used: Closed Cup
Explosive Limits: LEL: 2.6% at 25.0 C UEL: 42% at 25.0 C
Autoignition Pt: 215.00 C

MATERIAL SAFETY DATA SHEET

COX-FA Dimethylsulfoxide

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Fire Fighting Instructions:	As in any fire, wear self-contained breathing apparatus pressure-demand (MSHA/NIOSH approved or equivalent), and full protective gear to prevent contact with skin and eyes. Note: combustible as diluted in dimethyl sulfoxide
Flammable Properties and Hazards:	Can release vapors that form explosive mixtures at temperatures at or above the flashpoint. Those vapors include formaldehyde, methyl mercaptan, and sulfur dioxide. Combustible liquid and vapor. Container explosion may occur under fire conditions. Emits toxic fumes under fire conditions. On mixing with potassium permanganate it will flash instantaneously. Reacts violently with other acids. Vapors can travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas.
Extinguishing Media:	Use alcohol-resistant foam, carbon dioxide, water, or dry chemical spray when fighting fires involving this material. Use water spray to keep fire-exposed containers cool.
Unsuitable Extinguishing Media:	No data available.

6. Accidental Release Measures

Steps To Be Taken In Case Material Is Released Or Spilled:	Wear a NIOSH/MSHA approved self-contained breathing apparatus and appropriate personal protection (rubber boots, safety goggles, and heavy rubber gloves). Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container. After removal, ventilate contaminated area and flush thoroughly with water. Avoid release into the environment - very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
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7. Handling and Storage

Hazard Label Information:	Avoid contact with skin and eyes. Do not reuse this container. Use with adequate ventilation. Wash thoroughly after handling.
Precautions To Be Taken in Handling:	Avoid breathing (dust, vapor, mist, gas). Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure. Do not reuse this container. Hygroscopic. Keep away from sources of ignition. Use with adequate ventilation. Wash thoroughly after handling.
Precautions To Be Taken in Storing:	Keep away from sources of ignition. Keep away from incompatible substances. Keep tightly closed. Protect from moisture. Store at correct temperature.

8. Exposure Controls/Personal Protection

Protective Equipment Summary - Hazard Label Information:	Eye wash station in work area Lab coat Latex disposable gloves Safety glasses Safety shower in work area Vent Hood
Respiratory Equipment (Specify Type):	No data available.
Eye Protection:	Safety glasses
Protective Gloves:	Latex disposable gloves
Other Protective Clothing:	Lab coat
Engineering Controls (Ventilation etc.):	Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.
Work/Hygienic/Maintenance Practices:	Do not take internally. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Wash thoroughly after handling.

9. Physical and Chemical Properties

Physical States: [] Gas [X] Liquid [] Solid
Melting Point: No data.
Boiling Point: No data.
Autoignition Pt: 215.00 C
Flash Pt: 87.80 C Method Used: Closed Cup
Explosive Limits: LEL: 2.6% at 25.0 C UEL: 42% at 25.0 C
Specific Gravity (Water = 1): No data.
Vapor Pressure (vs. Air or mm Hg): 0.46 MM_HG at 20.0 C
Vapor Density (vs. Air = 1): No data.
Evaporation Rate (vs Butyl Acetate=1): No data.
Solubility in Water: No data.
Percent Volatile: No data.
Corrosion Rate: No data.
pH: No data.
Appearance and Odor: A clear, colorless solution

10. Stability and Reactivity

Stability: Unstable [] Stable [X]
Conditions To Avoid - Instability: protect from moisture
Incompatibility - Materials To Avoid: strong oxidizing agents
 strong acids
 strong bases
 acid chlorides
Hazardous Decomposition Or Byproducts: carbon monoxide
 carbon dioxide
 oxides of sulfur
 formaldehyde
 dimethyl sulfide
Hazardous Polymerization: Will occur [] Will not occur [X]
Conditions To Avoid - Hazardous Polymerization: keep away from ignition sources
 protect from heat

11. Toxicological Information

: The toxicological effects of this compound have not been thoroughly studied.

DMSO - Toxicity Data:

Oral (rat) LD50:14,500 mg/kg
 Skin (rat) LD50:40,000 mg/kg
 Oral (mouse) LD50:7,920 mg/kg

Carcinogenicity/Other Information: No data available.
Carcinogenicity: NTP? No IARC Monographs? No OSHA Regulated? No

12. Ecological Information

: Avoid release into the environment - very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
 Runoff from fire control or dilution water may cause pollution.

MATERIAL SAFETY DATA SHEET
COX-FA Dimethylsulfoxide

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13. Disposal Considerations

Waste Disposal Method: Dispose in accordance with local, state and federal regulations.

14. Transport Information

LAND TRANSPORT (US DOT)

DOT Proper Shipping Name Flammable liquids, n.o.s.

DOT Hazard Class: 3

DOT Hazard Label: FLAMMABLE LIQUID

UN/NA Number: UN1993

Packing Group: I

Additional Transport Information: Transport in accordance with local, state, and federal regulations.

15. Regulatory Information

US EPA SARA Title III

Hazardous Components (Chemical Name)	CAS #	Sec.302 (EHS)	Sec.304 RQ	Sec.313 (TRI)	Sec.110
1. Dimethyl sulfoxide, anhydrous	67-68-5	No	No	No	No

US EPA CAA, CWA, TSCA

Hazardous Components (Chemical Name)	CAS #	EPA CAA	EPA CWA NPDES	EPA TSCA	CA PROP 65
1. Dimethyl sulfoxide, anhydrous	67-68-5	No	No	Inventory	No

16. Other Information

Company Policy or Disclaimer

For research use only, not for human or veterinary clinical use.

DISCLAIMER: This information is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes.

MATERIAL SAFETY DATA SHEET

COX-FA Resorufin Standard

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Cayman Chemical Company
1180 E. Ellsworth Rd.
Ann Arbor, MI 48108

Printed: 01/08/2009
Revision: 01/05/2009

Date Created: 01/05/2009

1. Product and Company Identification

Product Code: 700112
Product Name: COX-FA Resorufin Standard
Manufacturer Information
Company Name: Cayman Chemical Company
Emergency Contact: Cayman Chemical Company (800)364-9897
Information: Cayman Chemical Company (734)971-3335

2. Composition/Information on Ingredients

Hazardous Components (Chemical Name)	CAS #	Concentration	OSHA PEL	ACGIH TLV	Other Limits
1. COX-FA Resorufin Standard	NA	0.021 %	No data.	No data.	No data.
2. Dimethyl sulfoxide, anhydrous	67-68-5	99.979 %	No data.	No data.	No data.

Hazardous Components (Chemical Name)	RTECS #	OSHA STEL	OSHA CEIL	ACGIH STEL	ACGIH CEIL
1. COX-FA Resorufin Standard	NA	No data.	No data.	No data.	No data.
2. Dimethyl sulfoxide, anhydrous	PV6210000	No data.	No data.	No data.	No data.

3. Hazards Identification

Emergency Overview: No data available.

Route(s) of Entry: Inhalation? Yes Skin? Yes Eyes? Yes Ingestion? Yes Other: Injection

Potential Health Effects (Acute and Chronic): The hazards identified with this product are those associated with the solvent(s). Avoid contact with DMSO solutions containing toxic materials or materials with unknown toxicological properties. Dimethyl sulfoxide is readily absorbed through skin and may carry such materials into the body.

Irritating to the skin, eyes, nose, throat, and respiratory tract.
Material may be irritating to the mucous membranes and upper respiratory tract.
May be harmful by inhalation, ingestion, or skin absorption.
May cause eye, skin, or respiratory system irritation.
The toxicological properties of this compound have not been fully evaluated.

LD 50 / LC 50: Please refer to Section 11

Signs and Symptoms Of Exposure: Skin absorption of DMSO may result in a garlic-like breath and body odor, and CNS effects such as headache, nausea, and dizziness.
Ingestion may cause gastrointestinal irritation with nausea, vomiting, diarrhea, CNS effects, and a garlic smell on the breath and body.

4. First Aid Measures

Emergency and First Aid Procedures:

If inhaled remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Get immediate medical attention.

If swallowed, wash out mouth with water provided person is conscious. Never give anything by mouth to an unconscious person. Get medical attention. Do NOT induce vomiting unless directed to do so by medical personnel.

In case of contact with eyes, hold eyelids apart and flush eyes with plenty of water. After initial flushings, remove any contact lenses and continue flushing for at least 20 minutes. Have eyes examined and tested by medical personnel.

In case of skin contact, immediately wash skin with soap and plenty of water. Remove contaminated clothing. Get medical attention if symptoms occur. Wash clothing before reuse.

5. Fire Fighting Measures

Flash Pt:	87.80 C Method Used: Closed Cup
Explosive Limits:	LEL: 2.6% at 25.0 C UEL: 42% at 25.0 C
Autoignition Pt:	215.00 C
Fire Fighting Instructions:	As in any fire, wear self-contained breathing apparatus pressure-demand (MSHA/NIOSH approved or equivalent), and full protective gear to prevent contact with skin and eyes. Note: combustible as diluted in dimethyl sulfoxide
Flammable Properties and Hazards:	Can release vapors that form explosive mixtures at temperatures at or above the flashpoint. Those vapors include formaldehyde, methyl mercaptan, and sulfur dioxide. Combustible liquid and vapor. Container explosion may occur under fire conditions. Emits toxic fumes under fire conditions. On mixing with potassium permanganate it will flash instantaneously. Reacts violently with other acids. Vapors can travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas.
Extinguishing Media:	Use alcohol-resistant foam, carbon dioxide, water, or dry chemical spray when fighting fires involving this material. Use water spray to keep fire-exposed containers cool.
Unsuitable Extinguishing Media:	No data available.

6. Accidental Release Measures

Steps To Be Taken In Case Material Is Released Or Spilled:	Wear a NIOSH/MSHA approved self-contained breathing apparatus and appropriate personal protection (rubber boots, safety goggles, and heavy rubber gloves). Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container. After removal, ventilate contaminated area and flush thoroughly with water. Avoid release into the environment - very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
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7. Handling and Storage

Hazard Label Information:	Avoid contact with skin and eyes. Do not reuse this container. Use with adequate ventilation. Wash thoroughly after handling.
Precautions To Be Taken in Handling:	Avoid breathing (dust, vapor, mist, gas). Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure. Do not reuse this container. Hygroscopic. Keep away from sources of ignition. Use with adequate ventilation. Wash thoroughly after handling.
Precautions To Be Taken in Storing:	Keep away from sources of ignition. Keep away from incompatible substances. Keep tightly closed. Protect from moisture. Store at correct temperature.

8. Exposure Controls/Personal Protection

Protective Equipment Summary - Hazard Label Information:	Eye wash station in work area Lab coat Latex disposable gloves Safety glasses Safety shower in work area Vent Hood
Respiratory Equipment (Specify Type):	No data available.
Eye Protection:	Safety glasses
Protective Gloves:	Latex disposable gloves

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COX-FA Resorufin Standard

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Other Protective Clothing:	Lab coat
Engineering Controls (Ventilation etc.):	Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.
Work/Hygienic/Maintenance Practices:	Do not take internally. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Wash thoroughly after handling.

9. Physical and Chemical Properties

Physical States:	<input type="checkbox"/> Gas <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Solid
Melting Point:	No data.
Boiling Point:	No data.
Autoignition Pt:	215.00 C
Flash Pt:	87.80 C Method Used: Closed Cup
Explosive Limits:	LEL: 2.6% at 25.0 C UEL: 42% at 25.0 C
Specific Gravity (Water = 1):	No data.
Vapor Pressure (vs. Air or mm Hg):	0.46 MM_HG at 20.0 C
Vapor Density (vs. Air = 1):	No data.
Evaporation Rate (vs Butyl Acetate=1):	No data.
Solubility in Water:	No data.
Percent Volatile:	No data.
Corrosion Rate:	No data.
pH:	No data.
Appearance and Odor:	A clear, colorless solution

10. Stability and Reactivity

Stability:	Unstable <input type="checkbox"/> Stable <input checked="" type="checkbox"/>
Conditions To Avoid - Instability:	protect from moisture
Incompatibility - Materials To Avoid:	strong oxidizing agents strong acids strong bases acid chlorides
Hazardous Decomposition Or Byproducts:	carbon monoxide carbon dioxide oxides of sulfur formaldehyde dimethyl sulfide
Hazardous Polymerization:	Will occur <input type="checkbox"/> Will not occur <input checked="" type="checkbox"/>
Conditions To Avoid - Hazardous Polymerization:	keep away from ignition sources protect from heat

11. Toxicological Information

:	The toxicological effects of this compound have not been thoroughly studied.
	DMSO - Toxicity Data: Oral (rat) LD50:14,500 mg/kg Skin (rat) LD50:40,000 mg/kg Oral (mouse) LD50:7,920 mg/kg
Carcinogenicity/Other Information:	No data available.
Carcinogenicity:	NTP? No IARC Monographs? No OSHA Regulated? No

MATERIAL SAFETY DATA SHEET

COX-FA Resorufin Standard

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12. Ecological Information

: Avoid release into the environment - very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Runoff from fire control or dilution water may cause pollution.

13. Disposal Considerations

Waste Disposal Method: Dispose in accordance with local, state and federal regulations.

14. Transport Information

LAND TRANSPORT (US DOT)

DOT Proper Shipping Name Flammable liquids, n.o.s.

DOT Hazard Class: 3

DOT Hazard Label: FLAMMABLE LIQUID

UN/NA Number: UN1993

Packing Group: I

Additional Transport Information: Transport in accordance with local, state, and federal regulations.

15. Regulatory Information

US EPA SARA Title III

Hazardous Components (Chemical Name)	CAS #	Sec.302 (EHS)	Sec.304 RQ	Sec.313 (TRI)	Sec.110
1. COX-FA Resorufin Standard	NA	No	No	No	No
2. Dimethyl sulfoxide, anhydrous	67-68-5	No	No	No	No

US EPA CAA, CWA, TSCA

Hazardous Components (Chemical Name)	CAS #	EPA CAA	EPA CWA NPDES	EPA TSCA	CA PROP 65
1. COX-FA Resorufin Standard	NA	No	No	No	No
2. Dimethyl sulfoxide, anhydrous	67-68-5	No	No	Inventory	No

16. Other Information

Company Policy or Disclaimer

For research use only, not for human or veterinary clinical use.

DISCLAIMER: This information is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes.