

# MATERIAL SAFETY DATA SHEET

## GST Assay Buffer (2X)

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

Printed: 08/18/2010  
Revision: 08/17/2010  
Supersedes Revision: 09/30/2004  
Date Created: 09/30/2004

### 1. Product and Company Identification

**Product Code:** 703310  
**Product Name:** GST Assay Buffer (2X)  
**Manufacturer Information**  
**Company Name:** Cayman Chemical Company  
**Emergency Contact:** Cayman Chemical Company (800)364-9897  
**Information:** Cayman Chemical Company (734)971-3335

### 2. Hazards Identification

**Emergency Overview:** Avoid contact and inhalation.  
**Route(s) of Entry:** Inhalation? Yes Skin? Yes Eyes? Yes Ingestion? Yes Other: Injection  
**Health Hazards (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 product have not been fully evaluated.  
**Signs and Symptoms Of Exposure:** No data available.

### 3. Composition/Information on Ingredients

Hazardous Components (Chemical Name)	CAS #	Concentration	EC#	RTECS #
1. Potassium phosphate, Monobasic	7778-77-0	2.7 %	231-913-4	TC6615500
2. Triton X100	9002-93-1	0.2 %	NA	YM0683332
3. Water	7732-18-5	97.1 %	231-791-2	ZC0110000

### 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 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 for at least 20 minutes. 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.  
**Special Fire Fighting Procedures:** As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent), and full protective gear to prevent contact with skin and eyes.  
**Unusual Fire and Explosion Hazards:** No data available.  
**Hazardous Combustion Products:** No data available.  
**Suitable Extinguishing Media:** Use alcohol-resistant foam, carbon dioxide, water, or dry chemical spray.  
Use water spray to cool fire-exposed containers.  
**Unsuitable Extinguishing Media:** A solid water stream may be inefficient.

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### 6. Accidental Release Measures

**Steps To Be Taken In Case Material Is Released Or Spilled:** Avoid release into the environment.  
 Avoid breathing vapors and provide adequate ventilation.  
 As conditions warrant, wear a NIOSH approved self-contained breathing apparatus, or respirator, 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 proper chemical waste container.

### 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 prolonged or repeated exposure.

**Precautions To Be Taken in Storing:** Keep tightly closed.  
 Store at correct temperature.

### 8. Exposure Controls/Personal Protection

Hazardous Components (Chemical Name)	CAS #	OSHA PEL	ACGIH TLV	Other Limits
1. Potassium phosphate, Monobasic	7778-77-0	No data.	No data.	No data.
2. Triton X100	9002-93-1	No data.	No data.	No data.
3. Water	7732-18-5	No data.	No data.	No data.

**Protective Equipment Summary - Hazard Label Information:** Compatible chemical-resistant gloves Eye wash station in work area Lab coat Safety glasses Safety shower in work area Vent Hood

**Respiratory Equipment (Specify Type):** NIOSH approved respirator, as conditions warrant.

**Eye Protection:** Safety glasses

**Protective Gloves:** Compatible chemical-resistant gloves

**Other Protective Clothing:** Lab coat

**Ventilation:** 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.

**Bulk density:** 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.

**Heat Value:** No data.

**Particle Size:** No data.

**Corrosion Rate:** No data.

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## GST Assay Buffer (2X)

**pH:** 6.5  
**Appearance and Odor:** No data available.

### 10. Stability and Reactivity

**Stability:** Unstable [ ] Stable [ X ]  
**Conditions To Avoid - Instability:** No data available.  
**Incompatibility - Materials To Avoid:** No data available.  
**Hazardous Decomposition Or Byproducts:** No data available.  
**Possibility of Hazardous Reactions:** Will occur [ ] Will not occur [ X ]  
**Conditions To Avoid - Hazardous Reactions:** No data available.

### 11. Toxicological Information

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

### 12. Ecological Information

**:** Avoid release into the 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** Not dangerous goods.  
**LAND TRANSPORT (European ADR/RID)**  
**ADR/RID Shipping Name** Not dangerous goods.  
**AIR TRANSPORT (ICAO/IATA)**  
**ICAO/IATA Shipping Name** Not dangerous goods.  
**Additional Transport Information:** Transport in accordance with local, state, and federal regulations.

### 15. Regulatory Information

**European Community Hazard Symbol codes**

No data available.

**European Community Risk and Safety Phrases**

S24/25 - Avoid contact with skin and eyes.

S37/39 - Wear suitable gloves and eye/face protection.

**US EPA SARA Title III**

Hazardous Components (Chemical Name)	CAS #	Sec.302 (EHS)	Sec.304 RQ	Sec.313 (TRI)	Sec.110
1. Potassium phosphate, Monobasic	7778-77-0	No	No	No	No
2. Triton X100	9002-93-1	No	No	No	No
3. 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	HPV/LPV
1. Potassium phosphate, Monobasic	7778-77-0	HAP, ODC ( )	No	Inventory	
2. Triton X100	9002-93-1	HAP, ODC ( )	No	Inventory, 8A PAIR	
3. Water	7732-18-5	HAP, ODC ( )	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.

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## GST Sample Buffer (2X)

Page: 1

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

Printed: 08/18/2010  
Revision: 08/17/2010  
Supersedes Revision: 09/30/2004  
Date Created: 09/30/2004

### 1. Product and Company Identification

**Product Code:** 703312  
**Product Name:** GST Sample Buffer (2X)  
**Manufacturer Information**  
**Company Name:** Cayman Chemical Company  
**Emergency Contact:** Cayman Chemical Company (800)364-9897  
**Information:** Cayman Chemical Company (734)971-3335

### 2. Hazards Identification

**Emergency Overview:** Avoid contact and inhalation.  
**Route(s) of Entry:** Inhalation? Yes Skin? Yes Eyes? Yes Ingestion? Yes Other: Injection  
**Health Hazards (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 product have not been fully evaluated.  
**Signs and Symptoms Of Exposure:** No data available.

### 3. Composition/Information on Ingredients

Hazardous Components (Chemical Name)	CAS #	Concentration	EC#	RTECS #
1. Potassium phosphate, Monobasic	7778-77-0	2.7 %	231-913-4	TC6615500
2. Triton X100	9002-93-1	0.2 %	NA	YM0683332
3. Glutathione, reduced	70-18-8	0.06 %	200-725-4	MC0556000
4. Water	7732-18-5	97.04 %	231-791-2	ZC0110000

### 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 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 for at least 20 minutes. 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.  
**Special Fire Fighting Procedures:** As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent), and full protective gear to prevent contact with skin and eyes.  
**Unusual Fire and Explosion Hazards:** No data available.  
**Hazardous Combustion Products:** No data available.  
**Suitable Extinguishing Media:** Use alcohol-resistant foam, carbon dioxide, water, or dry chemical spray.  
Use water spray to cool fire-exposed containers.  
**Unsuitable Extinguishing Media:** A solid water stream may be inefficient.

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## GST Sample Buffer (2X)

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### 6. Accidental Release Measures

**Steps To Be Taken In Case Material Is Released Or Spilled:** Avoid release into the environment.  
 Avoid breathing vapors and provide adequate ventilation.  
 As conditions warrant, wear a NIOSH approved self-contained breathing apparatus, or respirator, 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 proper chemical waste container.

### 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 prolonged or repeated exposure.

**Precautions To Be Taken in Storing:** Keep tightly closed.  
 Store at correct temperature.

### 8. Exposure Controls/Personal Protection

Hazardous Components (Chemical Name)	CAS #	OSHA PEL	ACGIH TLV	Other Limits
1. Potassium phosphate, Monobasic	7778-77-0	No data.	No data.	No data.
2. Triton X100	9002-93-1	No data.	No data.	No data.
3. Glutathione, reduced	70-18-8	No data.	No data.	No data.
4. Water	7732-18-5	No data.	No data.	No data.

**Protective Equipment Summary - Hazard Label Information:** Compatible chemical-resistant gloves Eye wash station in work area Lab coat Safety glasses Safety shower in work area Vent Hood

**Respiratory Equipment (Specify Type):** NIOSH approved respirator, as conditions warrant.

**Eye Protection:** Safety glasses

**Protective Gloves:** Compatible chemical-resistant gloves

**Other Protective Clothing:** Lab coat

**Ventilation:** 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.

**Bulk density:** 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.

**Heat Value:** No data.

**Particle Size:** No data.

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## GST Sample Buffer (2X)

<b>Corrosion Rate:</b>	No data.
<b>pH:</b>	6.5
<b>Appearance and Odor:</b>	No data available.

### 10. Stability and Reactivity

<b>Stability:</b>	Unstable [ <input type="checkbox"/> ]    Stable [ <input checked="" type="checkbox"/> ]
<b>Conditions To Avoid - Instability:</b>	No data available.
<b>Incompatibility - Materials To Avoid:</b>	No data available.
<b>Hazardous Decomposition Or Byproducts:</b>	No data available.
<b>Possibility of Hazardous Reactions:</b>	Will occur [ <input type="checkbox"/> ]    Will not occur [ <input checked="" type="checkbox"/> ]
<b>Conditions To Avoid - Hazardous Reactions:</b>	No data available.

### 11. Toxicological Information

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

### 12. Ecological Information

:	Avoid release into the environment. Runoff from fire control or dilution water may cause pollution.
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### 13. Disposal Considerations

<b>Waste Disposal Method:</b>	Dispose in accordance with local, state, and federal regulations.
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### 14. Transport Information

<b>LAND TRANSPORT (US DOT)</b>	
<b>DOT Proper Shipping Name</b>	Not dangerous goods.
<b>LAND TRANSPORT (European ADR/RID)</b>	
<b>ADR/RID Shipping Name</b>	Not dangerous goods.
<b>AIR TRANSPORT (ICAO/IATA)</b>	
<b>ICAO/IATA Shipping Name</b>	Not dangerous goods.
<b>Additional Transport Information:</b>	Transport in accordance with local, state, and federal regulations.

### 15. Regulatory Information

**European Community Hazard Symbol codes**  
No data available.

**European Community Risk and Safety Phrases**  
S24/25    - Avoid contact with skin and eyes.  
S37/39    - Wear suitable gloves and eye/face protection.

**US EPA SARA Title III**

Hazardous Components (Chemical Name)	CAS #	Sec.302 (EHS)	Sec.304 RQ	Sec.313 (TRI)	Sec.110
1. Potassium phosphate, Monobasic	7778-77-0	No	No	No	No
2. Triton X100	9002-93-1	No	No	No	No
3. Glutathione, reduced	70-18-8	No	No	No	No
4. 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	HPV/LPV
1. Potassium phosphate, Monobasic	7778-77-0	HAP, ODC ( )	No	Inventory	
2. Triton X100	9002-93-1	HAP, ODC ( )	No	Inventory, 8A PAIR	
3. Glutathione, reduced	70-18-8	HAP, ODC ( )	No	Inventory	
4. Water	7732-18-5	HAP, ODC ( )	No	Inventory	

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**GST Sample Buffer (2X)**

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**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.

**N.A.=Not available, N.P.=Not applicable, N.D.=Not determined, N.E.=Not established, N.R.=Not required**

# MATERIAL SAFETY DATA SHEET

## GST Assay (control)

Page: 1

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

Printed: 08/20/2010  
Revision: 08/17/2010  
Supersedes Revision: 09/30/2004  
Date Created: 09/30/2004

### 1. Product and Company Identification

**Product Code:** 703314  
**Product Name:** GST Assay (control)  
**Manufacturer Information**  
**Company Name:** Cayman Chemical Company  
**Emergency Contact:** Cayman Chemical Company (800)364-9897  
**Information:** Cayman Chemical Company (734)971-3335

### 2. Hazards Identification

**Emergency Overview:** Avoid contact and inhalation.  
**Route(s) of Entry:** Inhalation? Yes Skin? Yes Eyes? Yes Ingestion? Yes Other: Injection  
**Health Hazards (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 product have not been fully evaluated.  
**Signs and Symptoms Of Exposure:** No data available.

### 3. Composition/Information on Ingredients

Hazardous Components (Chemical Name)	CAS #	Concentration	EC#	RTECS #
1. Glutathione S-Transferase	50812-37-8	0.1 -1.0 %	NA	NA
2. Potassium phosphate, Monobasic	7778-77-0	0.0 -5.0 %	231-913-4	TC6615500
3. Glutathione, reduced	70-18-8	0.0 -1.0 %	200-725-4	MC0556000
4. Ethylenediamine Tetraacetic Acid	60-00-4	0.0 -1.0 %	200-449-4	AH4025000
5. Bovine Serum Albumin (BSA)	9048-46-8	0.0 -1.0 %	232-936-2	MT6446000
6. Water	7732-18-5	91.0 -99.9 %	231-791-2	ZC0110000

### 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 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 for at least 20 minutes. 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.  
**Special Fire Fighting Procedures:** As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent), and full protective gear to prevent contact with skin and eyes.  
**Unusual Fire and Explosion Hazards:** No data available.  
**Hazardous Combustion Products:** No data available.  
**Suitable Extinguishing Media:** Use alcohol-resistant foam, carbon dioxide, water, or dry chemical spray.  
Use water spray to cool fire-exposed containers.

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**Unsuitable Extinguishing Media:** A solid water stream may be inefficient.

### 6. Accidental Release Measures

**Steps To Be Taken In Case Material Is Released Or Spilled:** Avoid release into the environment.  
 Avoid breathing vapors and provide adequate ventilation.  
 As conditions warrant, wear a NIOSH approved self-contained breathing apparatus, or respirator, 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 proper chemical waste container.

### 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 prolonged or repeated exposure.

**Precautions To Be Taken in Storing:** Keep tightly closed.  
 Store at correct temperature.

### 8. Exposure Controls/Personal Protection

Hazardous Components (Chemical Name)	CAS #	OSHA PEL	ACGIH TLV	Other Limits
1. Glutathione S-Transferase	50812-37-8	No data.	No data.	No data.
2. Potassium phosphate, Monobasic	7778-77-0	No data.	No data.	No data.
3. Glutathione, reduced	70-18-8	No data.	No data.	No data.
4. Ethylenediamine Tetraacetic Acid	60-00-4	No data.	No data.	No data.
5. Bovine Serum Albumin (BSA)	9048-46-8	No data.	No data.	No data.
6. Water	7732-18-5	No data.	No data.	No data.

**Protective Equipment Summary - Hazard Label Information:** Compatible chemical-resistant gloves Eye wash station in work area Lab coat Safety glasses Safety shower in work area Vent Hood

**Respiratory Equipment (Specify Type):** NIOSH approved respirator, as conditions warrant.

**Eye Protection:** Safety glasses

**Protective Gloves:** Compatible chemical-resistant gloves

**Other Protective Clothing:** Lab coat

**Ventilation:** 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.

**Bulk density:** 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.

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## GST Assay (control)

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Printed: 08/20/2010

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Supercedes Revision: 09/30/2004

**Percent Volatile:** No data.  
**Heat Value:** No data.  
**Particle Size:** No data.  
**Corrosion Rate:** No data.  
**pH:** 7.0  
**Appearance and Odor:** No data available.

### 10. Stability and Reactivity

**Stability:** Unstable [ ] Stable [ X ]  
**Conditions To Avoid - Instability:** No data available.  
**Incompatibility - Materials To Avoid:** No data available.  
**Hazardous Decomposition Or Byproducts:** No data available.  
**Possibility of Hazardous Reactions:** Will occur [ ] Will not occur [ X ]  
**Conditions To Avoid - Hazardous Reactions:** No data available.

### 11. Toxicological Information

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

### 12. Ecological Information

**:** Avoid release into the 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** Not dangerous goods.  
**LAND TRANSPORT (European ADR/RID)**  
**ADR/RID Shipping Name** Not dangerous goods.  
**AIR TRANSPORT (ICAO/IATA)**  
**ICAO/IATA Shipping Name** Not dangerous goods.  
**Additional Transport Information:** Transport in accordance with local, state, and federal regulations.

### 15. Regulatory Information

#### European Community Hazard Symbol codes

No data available.

#### European Community Risk and Safety Phrases

S24/25 - Avoid contact with skin and eyes.

S37/39 - Wear suitable gloves and eye/face protection.

#### US EPA SARA Title III

Hazardous Components (Chemical Name)	CAS #	Sec.302 (EHS)	Sec.304 RQ	Sec.313 (TRI)	Sec.110
1. Glutathione S-Transferase	50812-37-8	No	No	No	No
2. Potassium phosphate, Monobasic	7778-77-0	No	No	No	No
3. Glutathione, reduced	70-18-8	No	No	No	No
4. Ethylenediamine Tetraacetic Acid	60-00-4	No	Yes 5000 LB	No	No
5. Bovine Serum Albumin (BSA)	9048-46-8	No	No	No	No
6. 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	HPV/LPV
1. Glutathione S-Transferase	50812-37-8	HAP, ODC ( )	No	No	

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Hazardous Components (Chemical Name)	CAS #	EPA CAA	EPA CWA NPDES	EPA TSCA	HPV/LPV
2. Potassium phosphate, Monobasic	7778-77-0	HAP, ODC ()	No	Inventory	
3. Glutathione, reduced	70-18-8	HAP, ODC ()	No	Inventory	
4. Ethylenediamine Tetraacetic Acid	60-00-4	HAP, ODC ()	No	Inventory	
5. Bovine Serum Albumin (BSA)	9048-46-8	HAP, ODC ()	No	Inventory	
6. Water	7732-18-5	HAP, ODC ()	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.

**N.A.=Not available, N.P.=Not applicable, N.D.=Not determined, N.E.=Not established, N.R.=Not required**

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

Printed: 08/18/2010  
Revision: 08/17/2010  
Supersedes Revision: 09/30/2004  
Date Created: 09/30/2004

## 1. Product and Company Identification

**Product Code:** 703316  
**Product Name:** GST Glutathione  
**Manufacturer Information**  
**Company Name:** Cayman Chemical Company  
**Emergency Contact:** Cayman Chemical Company (800)364-9897  
**Information:** Cayman Chemical Company (734)971-3335

## 2. Hazards Identification

**Emergency Overview:** Avoid contact and inhalation.  
**Route(s) of Entry:** Inhalation? Yes Skin? Yes Eyes? Yes Ingestion? Yes Other: Injection  
**Health Hazards (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 product have not been fully evaluated.  
**Signs and Symptoms Of Exposure:** No data available.

## 3. Composition/Information on Ingredients

Hazardous Components (Chemical Name)	CAS #	Concentration	EC#	RTECS #
1. Glutathione, reduced	70-18-8	0.0 -5.0 %	200-725-4	MC0556000
2. Potassium phosphate, Monobasic	7778-77-0	0.0 -5.0 %	231-913-4	TC6615500
3. Water	7732-18-5	90.0 -100.0 %	231-791-2	ZC0110000

## 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 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 for at least 20 minutes. 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.  
**Special Fire Fighting Procedures:** As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent), and full protective gear to prevent contact with skin and eyes.  
**Unusual Fire and Explosion Hazards:** No data available.  
**Hazardous Combustion Products:** No data available.  
**Suitable Extinguishing Media:** Use alcohol-resistant foam, carbon dioxide, water, or dry chemical spray.  
 Use water spray to cool fire-exposed containers.  
**Unsuitable Extinguishing Media:** A solid water stream may be inefficient.

# MATERIAL SAFETY DATA SHEET

## GST Glutathione

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### 6. Accidental Release Measures

**Steps To Be Taken In Case Material Is Released Or Spilled:** Avoid release into the environment.  
 Avoid breathing vapors and provide adequate ventilation.  
 As conditions warrant, wear a NIOSH approved self-contained breathing apparatus, or respirator, 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 proper chemical waste container.

### 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 prolonged or repeated exposure.

**Precautions To Be Taken in Storing:** Keep tightly closed.  
 Store at correct temperature.

### 8. Exposure Controls/Personal Protection

Hazardous Components (Chemical Name)	CAS #	OSHA PEL	ACGIH TLV	Other Limits
1. Glutathione, reduced	70-18-8	No data.	No data.	No data.
2. Potassium phosphate, Monobasic	7778-77-0	No data.	No data.	No data.
3. Water	7732-18-5	No data.	No data.	No data.

**Protective Equipment Summary - Hazard Label Information:** Compatible chemical-resistant gloves Eye wash station in work area Lab coat Safety glasses Safety shower in work area Vent Hood

**Respiratory Equipment (Specify Type):** NIOSH approved respirator, as conditions warrant.

**Eye Protection:** Safety glasses

**Protective Gloves:** Compatible chemical-resistant gloves

**Other Protective Clothing:** Lab coat

**Ventilation:** 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.

**Bulk density:** 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.

**Heat Value:** No data.

**Particle Size:** No data.

**Corrosion Rate:** No data.

# MATERIAL SAFETY DATA SHEET

## GST Glutathione

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**pH:** 7.0  
**Appearance and Odor:** No data available.

### 10. Stability and Reactivity

**Stability:** Unstable [ ] Stable [ X ]  
**Conditions To Avoid - Instability:** No data available.  
**Incompatibility - Materials To Avoid:** No data available.  
**Hazardous Decomposition Or Byproducts:** No data available.  
**Possibility of Hazardous Reactions:** Will occur [ ] Will not occur [ X ]  
**Conditions To Avoid - Hazardous Reactions:** No data available.

### 11. Toxicological Information

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

### 12. Ecological Information

**:** Avoid release into the 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** Not dangerous goods.  
**LAND TRANSPORT (European ADR/RID)**  
**ADR/RID Shipping Name** Not dangerous goods.  
**AIR TRANSPORT (ICAO/IATA)**  
**ICAO/IATA Shipping Name** Not dangerous goods.  
**Additional Transport Information:** Transport in accordance with local, state, and federal regulations.

### 15. Regulatory Information

**European Community Hazard Symbol codes**  
 No data available.  
**European Community Risk and Safety Phrases**  
 S24/25 - Avoid contact with skin and eyes.  
 S37/39 - Wear suitable gloves and eye/face protection.

**US EPA SARA Title III**

Hazardous Components (Chemical Name)	CAS #	Sec.302 (EHS)	Sec.304 RQ	Sec.313 (TRI)	Sec.110
1. Glutathione, reduced	70-18-8	No	No	No	No
2. Potassium phosphate, Monobasic	7778-77-0	No	No	No	No
3. 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	HPV/LPV
1. Glutathione, reduced	70-18-8	HAP, ODC ( )	No	Inventory	
2. Potassium phosphate, Monobasic	7778-77-0	HAP, ODC ( )	No	Inventory	
3. Water	7732-18-5	HAP, ODC ( )	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.

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Date Created: 09/30/2004

## 1. Product and Company Identification

**Product Code:** 703318  
**Product Name:** GST CDNB  
**Manufacturer Information**  
**Company Name:** Cayman Chemical Company  
**Emergency Contact:** Cayman Chemical Company (800)364-9897  
**Information:** Cayman Chemical Company (734)971-3335

## 2. Hazards Identification

**Emergency Overview:** Highly Flammable.  
 Target Organ(s): blood, central nervous system, eyes, liver, reproductive system, respiratory system, skin.  
 The hazards identified with this product are those associated with the solvent(s).

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

**Health Hazards (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 product have not been fully evaluated.

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

**Signs and Symptoms Of Exposure:** Irritating to eyes, skin, nose; may cause headache, drowsiness, lassitude (weakness, exhaustion), narcosis; cough; liver damage; anemia; reproductive, teratogenic effects.

## 3. Composition/Information on Ingredients

Hazardous Components (Chemical Name)	CAS #	Concentration	EC#	RTECS #
1. 1-Chloro-2,4-dinitrobenzene	97-00-7	0.0 -1.0 %	202-551-4	CZ0525000
2. Ethyl alcohol	64-17-5	99.0 -100.0 %	200-578-6	KQ6300000

## 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 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 for at least 20 minutes. Remove contaminated clothing. Get medical attention if symptoms occur. Wash clothing before reuse.

## 5. Fire Fighting Measures

**Flash Pt:** 14.00 C Method Used: Closed Cup

**Explosive Limits:** LEL: 3.3% at 25.0 C UEL: 19% at 25.0 C

**Autoignition Pt:** 363.00 C

**Special Fire Fighting Procedures:** As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent), and full protective gear to prevent contact with skin and eyes.  
 Note: Flammable as diluted in ethanol.

**Unusual Fire and Explosion 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.  
 Sensitive to static discharge.

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## GST CDNB

Vapors can travel to a source of ignition and flash back.

**Hazardous Combustion Products:** No data available.  
**Suitable Extinguishing Media:** Use alcohol-resistant foam, carbon dioxide, water, or dry chemical spray.  
 Use water spray to cool fire-exposed containers.  
**Unsuitable Extinguishing Media:** A solid water stream may be inefficient.

### 6. Accidental Release Measures

**Steps To Be Taken In Case Material Is Released Or Spilled:** Avoid release into the environment.  
 Avoid breathing vapors and provide adequate ventilation.  
 Remove all sources of ignition.  
 As conditions warrant, wear a NIOSH approved self-contained breathing apparatus, or respirator, 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.

### 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 prolonged or repeated exposure.  
 Keep away from sources of ignition.  
 Prevent the build up of electrostatic charge.  
**Precautions To Be Taken in Storing:** Keep away from heat, sparks, and flame.  
 Keep tightly closed.  
 Store at correct temperature.  
**Other Precautions:** Hygroscopic.

### 8. Exposure Controls/Personal Protection

Hazardous Components (Chemical Name)	CAS #	OSHA PEL	ACGIH TLV	Other Limits
1. 1-Chloro-2,4-dinitrobenzene	97-00-7	No data.	No data.	No data.
2. Ethyl alcohol	64-17-5	1000 ppm	1000 ppm	No data.

**Protective Equipment Summary - Hazard Label Information:** Compatible chemical-resistant gloves Eye wash station in work area Lab coat Safety glasses Safety shower in work area Vent Hood  
**Respiratory Equipment (Specify Type):** NIOSH approved respirator, as conditions warrant.  
**Eye Protection:** Safety glasses  
**Protective Gloves:** Compatible chemical-resistant gloves  
**Other Protective Clothing:** Lab coat  
**Ventilation:** 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:** 363.00 C  
**Flash Pt:** 14.00 C Method Used: Closed Cup  
**Explosive Limits:** LEL: 3.3% at 25.0 C UEL: 19% at 25.0 C  
**Specific Gravity (Water = 1):** No data.

# MATERIAL SAFETY DATA SHEET

## GST CDNB

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<b>Bulk density:</b>	No data.
<b>Vapor Pressure (vs. Air or mm Hg):</b>	43 MM_HG at 20.0 C
<b>Vapor Density (vs. Air = 1):</b>	No data.
<b>Evaporation Rate (vs Butyl Acetate=1):</b>	No data.
<b>Solubility in Water:</b>	No data.
<b>Percent Volatile:</b>	No data.
<b>Heat Value:</b>	No data.
<b>Particle Size:</b>	No data.
<b>Corrosion Rate:</b>	No data.
<b>pH:</b>	No data.
<b>Appearance and Odor:</b>	No data available.

### 10. Stability and Reactivity

<b>Stability:</b>	Unstable [ ] Stable [ X ]
<b>Conditions To Avoid - Instability:</b>	heat, flames and sparks
<b>Incompatibility - Materials To Avoid:</b>	alkali metals ammonia peroxides strong oxidizing agents
<b>Hazardous Decomposition Or Byproducts:</b>	carbon dioxide carbon monoxide
<b>Possibility of Hazardous Reactions:</b>	Will occur [ ] Will not occur [ X ]
<b>Conditions To Avoid - Hazardous Reactions:</b>	No data available.

### 11. Toxicological Information

:	The toxicological effects of this product have not been thoroughly studied.
<b>Chronic Toxicological Effects:</b>	Ethanol - Toxicity Data: Oral LD50 (rat): 7,060 mg/kg; Inhalation LC50 (rat): 20,000 ppm (10h); Irritation Data: Eyes (rabbit): 500 mg (24h) mild; Skin (rabbit) 20mg (24h) moderate; Only select Registry of Toxic Effects of Chemical Substances (RTECS) data is presented here. See actual entry in RTECS for complete information. Ethanol RTECS Number: KQ6300000
<b>Carcinogenicity/Other Information:</b>	No data available.
<b>Carcinogenicity:</b>	NTP? No IARC Monographs? No OSHA Regulated? No

### 12. Ecological Information

:	Avoid release into the environment. Runoff from fire control or dilution water may cause pollution.
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### 13. Disposal Considerations

<b>Waste Disposal Method:</b>	Dispose in accordance with local, state, and federal regulations.
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### 14. Transport Information

<b>LAND TRANSPORT (US DOT)</b>	
<b>DOT Proper Shipping Name</b>	Ethyl Alcohol Solution
<b>DOT Hazard Class:</b>	3
<b>DOT Hazard Label:</b>	FLAMMABLE LIQUID
<b>UN/NA Number:</b>	1170
<b>Packing Group:</b>	II
<b>LAND TRANSPORT (European ADR/RID)</b>	
<b>ADR/RID Shipping Name</b>	Ethyl Alcohol Solution
<b>UN Number:</b>	1170

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## GST CDNB

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**Packing Group:** II

**AIR TRANSPORT (ICAO/IATA)**

**ICAO/IATA Shipping Name** Ethyl Alcohol Solution

**UN Number:** 1170

**Packing Group:** II

**IATA Classification:** 3

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

### 15. Regulatory Information

**European Community Hazard Symbol codes** F: Highly Flammable

**European Community Risk and Safety Phrases**

- R11 - Highly flammable.
- S7 - Keep container tightly closed.
- S16 - Keep away from sources of ignition.

**US EPA SARA Title III**

Hazardous Components (Chemical Name)	CAS #	Sec.302 (EHS)	Sec.304 RQ	Sec.313 (TRI)	Sec.110
1. 1-Chloro-2,4-dinitrobenzene	97-00-7	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	HPV/LPV
1. 1-Chloro-2,4-dinitrobenzene	97-00-7	HAP, ODC ()	No	Inventory	
2. Ethyl alcohol	64-17-5	HAP, ODC ()	No	Inventory	

### 16. Other Information

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