



**ZYMO RESEARCH**  
*The Beauty of Science is to Make Things Simple*

## Material Safety Data Sheet

Zymo Research advises each customer or recipient of this MSDS to study it carefully to become aware of and understand the hazards associated with the product. The reader should consider consulting reference works or individuals who are experts in ventilation, toxicology, and fire prevention, as necessary or appropriate to use and understand the data contained in this MSDS.

To promote safe handling, each customer or recipient should: (1) notify its employees, agents, contractors and others whom it knows or believes will use this material or the information in this MSDS and any other information regarding hazards or safety; (2) furnish this same information to each of its customers for the product; and (3) request its customers to notify their employees, customers, and other users of the product of this information.

### Section 1 – Product and Company Information

**Reagent/Buffer Name:** GpC Methylase (M.CviPI)  
**Catalog Number:** E2014, E2015

**Company:** Zymo Research Corp.  
**Street Address:** 17062 Murphy Ave.  
**City, State, Zip Code, Country:** Irvine, CA 92614 US  
**Phone:** 949-679-1190  
**Fax:** 949-266-9452

### Section 2 – Ingredient Information/Composition

**Description:** Mixture of the substances listed below with nonhazardous additions.

Dangerous Components Name	CAS #	EC No.	Formula	Percent
Glycerol	56-81-5	200-289-5	C <sub>3</sub> H <sub>8</sub> O <sub>3</sub>	≤ 50%

### Section 3 – Hazard Identification

**Target Organs:** Kidneys

**NFPA Ratings (scale 0 - 4) :** Health = 1  
Fire = 1  
Reactivity = 0

**HMIS Ratings (scale 0 – 4) :** Health = 1  
Fire = 1  
Reactivity = 0

**Potential Acute Health Effects:** Slightly hazardous in case of skin contact (irritant), eye contact (irritant), ingestion, inhalation.

**Potential Chronic Health Effects:** May be toxic to kidneys. Repeated or prolonged exposure to the substance can produce target organs damage.

### Section 4 – First Aid Measures

In Case of  
**Eye Contact:** Flush contaminated eye(s) with copious volumes of water for at least 15 minutes. Get medical attention if eye(s) remain irritated.

<b>Skin Contact:</b>	Wash contaminated areas with soap and water as contaminated clothing is removed. Do not wear contaminated clothing until after it has been properly cleaned. Get medical attention if irritation develops.
<b>Ingestion:</b>	Wash out mouth with water provided person is conscious. Do NOT induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms appear.
<b>Inhalation:</b>	Remove victim to fresh air. Give oxygen if breathing becomes difficult. Should breathing stop-give artificial respiration. Get medical attention immediately.

## Section 5 – Fire Fighting Measures

<b>Flammability:</b>	May be combustible at high temperature.
<b>Extinguishing Media:</b>	Dry chemical powder, water spray, fog or foam.
<b>Products of Combustion:</b>	Carbon oxides (CO, CO2), irritating and toxic fumes.
<b>Fire Hazards in Presence of Various Substances:</b>	Slightly flammable to flammable in presence of open flames and sparks, of heat, of oxidizing materials. Non-flammable in presence of shocks.
<b>Explosion Hazards in Presence of Various Substances:</b>	Explosive in presence of oxidizing materials.

## Section 6 – Accidental Release Measures

<b>General Information:</b>	Wear self-contained breathing apparatus, safety goggles, rubber boots, full suit, and protective gloves.
<b>Spills / Leaks:</b>	Absorb with an inert dry material and place in an appropriate waste disposal container for waste disposal. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Dispose of according to local and regional authority requirements. Ventilate area and wash spill site after material pickup is complete.

## Section 7 – Handling and Storage

<b>Handling:</b>	Keep away from sources of ignition, heat, and incompatibles such as oxidizing agents. Ground all equipment containing material. Wear suitable protective clothing. Do not ingest. Do not breathe gas/fumes/ vapor/spray.
<b>Storage:</b>	Keep container tightly closed in a cool, well-ventilated area. Hygroscopic.

## Section 8 – Exposure Controls / Personal Protection

Provide appropriate ventilation or local exhaust. Respiratory protection is not necessary for normal handling. Wear protective gloves, safety glasses, lab coat. Provide safety showers and eye stations proximal to the work-station location. Use a vapor respirator under conditions where exposure to the substance is apparent and/or engineering controls are not feasible. Be sure to use an approved/certified respirator or equivalent. Do not breathe vapor. Avoid contact with eyes, skin and clothing. Avoid prolonged or repeated exposure. Keep tightly closed. Wash thoroughly after handling.

<b>Exposure Limits:</b>	TWA: 10 (mg/m3) from ACGIH (TLV) [United States] [1999] Inhalation Total. TWA: 15 (mg/m3) from OSHA (PEL) [United States] Inhalation Total. TWA: 10 STEL: 20 (mg/m3) [Canada] TWA: 5 (mg/m3) from OSHA (PEL) [United States] Inhalation Respirable. Consult local authorities for acceptable exposure limits.
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## Section 9 – Physical and Chemical Properties

<b>Physical States / Form:</b>	Liquid
<b>Appearance:</b>	Colorless

<b>Melting Point:</b>	19°C
<b>Boiling Point:</b>	290°C
<b>Autoignition Temperature:</b>	369°C
<b>Flash Point:</b>	160°C
<b>Vapor Pressure:</b>	0 kPa 20°C
<b>Specific Gravity:</b>	1.261
<b>Vapor Density:</b>	3.1
<b>Solubility:</b>	Miscible in water and alcohol.

## Section 10 – Stability and Reactivity

<b>Stability:</b>	Stable.
<b>Substances To Be Avoided:</b>	Strong oxidizing agents, strong bases.
<b>Conditions To Be Avoided:</b>	Avoid contact with incompatible materials, excess heat and ignition, sources, moisture.
<b>Corrosivity:</b>	Non-corrosive in presence of glass.
<b>Hazardous Polymerization:</b>	Will not occur.

## Section 11 – Toxicological Information

<b>Acute Effects</b>	
<b>Inhalation:</b>	Inhalation of mist may cause respiratory tract irritation.
<b>Eye Contact:</b>	Causes eye irritation.
<b>Skin Contact:</b>	Causes skin irritation. May be absorbed through the skin.
<b>Ingestion:</b>	Low hazard. Low toxicity except with very large doses. Prolonged or repeated ingestion may affect the blood, endocrine system, respiratory system, and may cause kidney injury.
<b>Route Of Entry::</b>	Eye contact. Skin absorption.
<b>RTECS Number:</b>	MA8050000

### Toxicity Data:

Route	Organism	Dose	Reference
Oral	Rat	LD50: 12600 mg/kg	FEPR7 4,142,1945
Intraperitoneal	Rat	LD50: 4420 mg/kg	RCOCB8 56,125,1987
Subcutaneous	Rat	LC50: 100 mg/kg	NIIRDN 6,215,1982
Intravenous	Rat	LD50: 5566 mg/kg	ARZNAD 26,1581,1976
Oral	Mouse	LD50: 4090 mg/kg	FRZKAP (6),56,1977
Intraperitoneal	Mouse	LC50: 8700 mg/kg	ARZNAD 28,1579,1978
Subcutaneous	Mouse	LC50: 91 mg/kg	NIIRDN 6,215,1982
Intravenous	Mouse	LD50: 4250 mg/kg	JAPMA8 39,583,1950
Oral	Rabbit	LD50: 27 gm/kg	DMDJAP 31,276,1959
Intravenous	Rabbit	LD50: 53 gm/kg	NIIRDN 6,215,1982
Oral	Guinea Pig	LC50: 7750 mg/kg	JHTAB 23,259,1941

Only selected registry of toxic effects of chemical substances (RTECS) data is presented here. See actual entry in RTECS for complete information.

<b>Additional Information:</b>	The product should be handled with the normal caution accorded to chemical handling. Additional harmful properties cannot be ruled out.
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## Section 12 – Ecological Information

**Environmental Toxicity:** This material is not expected to be toxic to aquatic life.

## Section 13 – Disposal Considerations

Observe all federal, state, and local environmental regulations. Contact a licensed professional waste disposal service to dispose of this material. Do not dispose with household garbage.

## Section 14 – Transport Considerations

**DOT Classification:** Not a DOT controlled material (United States).

## Section 15 – Regulatory Information

**Federal and State Regulations:**

**TSCA 8(b) Inventory:** Glycerine

**California Proposition 65 Warnings:**

California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: No products were found.

California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: No products were found.

**Other Regulations:**

**OSHA:** Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

**EINECS:** This product is on the European Inventory of Existing Commercial Chemical Substances.

**AICS:** Listed

**Canadian Domestic Substance List (DSL):** Listed

**National Inventory (ENCS):** Listed

**National Inventory (KECI):** Listed

**National Inventory (PICCS):** Listed

**Other Classifications:**

**DSCL (EEC):** N/A

**Canada – WHMIS:** Not controlled under WHMIS (Canada).

## Section 16 – Other Information

The above information is believed to be correct, but does not purport to be all-inclusive and should be used only as a guide. Zymo Research shall not be held liable for any damage or other consequences resulting from handling or from contact with the above product. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall Zymo Research be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Zymo Research has been advised or the possibility of such damages. All materials supplied by Zymo Research Corp are intended to be used by trained professionals and are for research use only.



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### Section 1 – Product and Company Information

**Reagent/Buffer Name:** 10X GpC Reaction Buffer (Component A)  
**Catalog Number:** E2014-2

**Company:** Zymo Research Corp.  
**Street Address:** 17062 Murphy Ave.  
**City, State, Zip Code, Country:** Irvine, CA 92614 US  
**Phone:** 949-679-1190  
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### Section 2 – Ingredient Information/Composition

**Description:** Mixture of the substances listed below with nonhazardous additions.

Dangerous Components Name	CAS #	EC No.	Formula	Percent
Glycerol	56-81-5	200-289-5	C <sub>3</sub> H <sub>8</sub> O <sub>3</sub>	≤ 5%

### Section 3 – Hazard Identification

**Target Organs:** Kidneys

**NFPA Ratings (scale 0 - 4) :** Health = 1  
Fire = 1  
Reactivity = 0

**HMIS Ratings (scale 0 – 4) :** Health = 1  
Fire = 1  
Reactivity = 0

**Potential Acute Health Effects:** Slightly hazardous in case of skin contact (irritant), eye contact (irritant), ingestion, inhalation.

**Potential Chronic Health Effects:** May be toxic to kidneys. Repeated or prolonged exposure to the substance can produce target organs damage.

### Section 4 – First Aid Measures

In Case of  
**Eye Contact:** Flush contaminated eye(s) with copious volumes of water for at least 15 minutes. Get medical attention if eye(s) remain irritated.

<b>Skin Contact:</b>	Wash contaminated areas with soap and water as contaminated clothing is removed. Do not wear contaminated clothing until after it has been properly cleaned. Get medical attention if irritation develops.
<b>Ingestion:</b>	Wash out mouth with water provided person is conscious. Do NOT induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms appear.
<b>Inhalation:</b>	Remove victim to fresh air. Give oxygen if breathing becomes difficult. Should breathing stop-give artificial respiration. Get medical attention immediately.

## Section 5 – Fire Fighting Measures

<b>Flammability:</b>	May be combustible at high temperature.
<b>Extinguishing Media:</b>	Dry chemical powder, water spray, fog or foam.
<b>Products of Combustion:</b>	Carbon oxides (CO, CO <sub>2</sub> ), irritating and toxic fumes.
<b>Fire Hazards in Presence of Various Substances:</b>	Slightly flammable to flammable in presence of open flames and sparks, of heat, of oxidizing materials. Non-flammable in presence of shocks.
<b>Explosion Hazards in Presence of Various Substances:</b>	Explosive in presence of oxidizing materials.

## Section 6 – Accidental Release Measures

<b>General Information:</b>	Wear self-contained breathing apparatus, safety goggles, rubber boots, full suit, and protective gloves.
<b>Spills / Leaks:</b>	Absorb with an inert dry material and place in an appropriate waste disposal container for waste disposal. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Dispose of according to local and regional authority requirements. Ventilate area and wash spill site after material pickup is complete.

## Section 7 – Handling and Storage

<b>Handling:</b>	Keep away from sources of ignition, heat, and incompatibles such as oxidizing agents. Ground all equipment containing material. Wear suitable protective clothing. Do not ingest. Do not breathe gas/fumes/ vapor/spray.
<b>Storage:</b>	Keep container tightly closed in a cool, well-ventilated area. Hygroscopic.

## Section 8 – Exposure Controls / Personal Protection

Provide appropriate ventilation or local exhaust. Respiratory protection is not necessary for normal handling. Wear protective gloves, safety glasses, lab coat. Provide safety showers and eye stations proximal to the work-station location. Use a vapor respirator under conditions where exposure to the substance is apparent and/or engineering controls are not feasible. Be sure to use an approved/certified respirator or equivalent. Do not breathe vapor. Avoid contact with eyes, skin and clothing. Avoid prolonged or repeated exposure. Keep tightly closed. Wash thoroughly after handling.

<b>Exposure Limits:</b>	TWA: 10 (mg/m <sup>3</sup> ) from ACGIH (TLV) [United States] [1999] Inhalation Total. TWA: 15 (mg/m <sup>3</sup> ) from OSHA (PEL) [United States] Inhalation Total. TWA: 10 STEL: 20 (mg/m <sup>3</sup> ) [Canada] TWA: 5 (mg/m <sup>3</sup> ) from OSHA (PEL) [United States] Inhalation Respirable. Consult local authorities for acceptable exposure limits.
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## Section 9 – Physical and Chemical Properties

<b>Physical States / Form:</b>	Liquid
<b>Appearance:</b>	Colorless

<b>Melting Point:</b>	19°C
<b>Boiling Point:</b>	290°C
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<b>Flash Point:</b>	160°C
<b>Vapor Pressure:</b>	0 kPa 20°C
<b>Specific Gravity:</b>	1.261
<b>Vapor Density:</b>	3.1
<b>Solubility:</b>	Miscible in water and alcohol.

## Section 10 – Stability and Reactivity

<b>Stability:</b>	Stable.
<b>Substances To Be Avoided:</b>	Strong oxidizing agents, strong bases.
<b>Conditions To Be Avoided:</b>	Avoid contact with incompatible materials, excess heat and ignition, sources, moisture.
<b>Corrosivity:</b>	Non-corrosive in presence of glass.
<b>Hazardous Polymerization:</b>	Will not occur.

## Section 11 – Toxicological Information

<b>Acute Effects</b>	
<b>Inhalation:</b>	Inhalation of mist may cause respiratory tract irritation.
<b>Eye Contact:</b>	Causes eye irritation.
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<b>Ingestion:</b>	Low hazard. Low toxicity except with very large doses. Prolonged or repeated ingestion may affect the blood, endocrine system, respiratory system, and may cause kidney injury.
<b>Route Of Entry::</b>	Eye contact. Skin absorption.
<b>RTECS Number:</b>	MA8050000

### Toxicity Data:

Route	Organism	Dose	Reference
Oral	Rat	LD50: 12600 mg/kg	FEPR7 4,142,1945
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Intravenous	Mouse	LD50: 4250 mg/kg	JAPMA8 39,583,1950
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Oral	Guinea Pig	LC50: 7750 mg/kg	JHTAB 23,259,1941

Only selected registry of toxic effects of chemical substances (RTECS) data is presented here. See actual entry in RTECS for complete information.

<b>Additional Information:</b>	The product should be handled with the normal caution accorded to chemical handling. Additional harmful properties cannot be ruled out.
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## Section 12 – Ecological Information

**Environmental Toxicity:** This material is not expected to be toxic to aquatic life.

## Section 13 – Disposal Considerations

Observe all federal, state, and local environmental regulations. Contact a licensed professional waste disposal service to dispose of this material. Do not dispose with household garbage.

## Section 14 – Transport Considerations

**DOT Classification:** Not a DOT controlled material (United States).

## Section 15 – Regulatory Information

**Federal and State Regulations:**

**TSCA 8(b) Inventory:** Glycerine

**California Proposition 65 Warnings:**

California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: No products were found.

California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: No products were found.

**Other Regulations:**

**OSHA:** Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

**EINECS:** This product is on the European Inventory of Existing Commercial Chemical Substances.

**AICS:** Listed

**Canadian Domestic Substance List (DSL):** Listed

**National Inventory (ENCS):** Listed

**National Inventory (KECI):** Listed

**National Inventory (PICCS):** Listed

**Other Classifications:**

**DSCL (EEC):** N/A

**Canada – WHMIS:** Not controlled under WHMIS (Canada).

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### Section 1 – Product and Company Information

**Reagent/Buffer Name:** 10X GpC Reaction Buffer (Component B)  
**Catalog Number:** E2014-2

**Company:** Zymo Research Corp.  
**Street Address:** 17062 Murphy Ave.  
**City, State, Zip Code, Country:** Irvine, CA 92614 US  
**Phone:** 949-679-1190  
**Fax:** 949-266-9452

**Description:** Mixture of the substances listed below with nonhazardous additions.

Dangerous Components Name	CAS #	Formula	Percent
DTT, 1,4-Dimercapto-, 2,3-Butanediol, Cleland's Reagent, DL-1,4-Dithiothreitol, DL-Dithiothreitol, DL-Threo-, DL-Threo-1,4-Butanediol, RAC-Dithiothreitol	3483-12-3	C <sub>4</sub> H <sub>10</sub> O <sub>2</sub> S <sub>2</sub>	≤2%

### Section 3 – Hazard Identification

**Emergency Overview:** Harmful if absorbed through skin, inhaled or swallowed.  
Irritating to skin, eyes, and respiratory system.

**Target Organs:** Central nervous system

**NFPA Ratings (scale 0 - 4) :** Health = 2  
Fire = 1  
Reactivity = 0

**HMIS Ratings (scale 0 - 4) :** Health = 2  
Fire = 1  
Physical Hazard = 0

### Section 4 – First Aid Measures

In Case of

**Eye Contact:** Flush contaminated eye(s) with large volumes of water for at least 15 minutes. Get medical attention if eye(s) remain irritated.

**Skin Contact:** Wash contaminated areas with soap and water as contaminated clothing is removed. Do not wear contaminated clothing until after it has been properly cleaned. Get medical attention if symptoms occur.

<b>Ingestion:</b>	If victim is conscious wash out mouth with water. Get medical attention.
<b>Inhalation:</b>	Remove to fresh air. Give oxygen if breathing is difficult. Give artificial respiration if victim is not breathing. Get medical attention.

## Section 5 – Fire Fighting Measures

<b>Extinguishing Media:</b>	Water spray, carbon dioxide, dry chemical powder, or appropriate foam.
<b>Special Fire Fighting Procedures:</b>	Wear self-contained breathing apparatus and protective garments to prevent contact with skin and eyes. To cool fire-exposed containers use water spray.
<b>Unusual Fire And Explosions Hazards:</b>	DTT emits toxic fumes under fire conditions.

## Section 6 – Accidental Release Measures

<b>General Information:</b>	Evacuate spill area. Wear self-contained breathing apparatus, chemical safety goggles, rubber boots, and heavy rubber gloves.
<b>Spills / Leaks:</b>	Ventilate area. Sweep up, while not raising dust. Place in suitable closed containers for waste disposal. Wash spill site after substance is completely cleared.

## Section 7 – Handling and Storage

<b>Handling:</b>	Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.
<b>Storage:</b>	Store refrigerated at 2-8°C and tightly closed.

## Section 8 – Exposure Controls / Personal Protection

Provide appropriate ventilation or local exhaust. Under conditions where exposure to the substance is apparent and/or engineering controls are not feasible, wear an appropriate NIOSH / MSHA approved respirator. Wear protective gloves, body-covering clothing and safety goggles. Provide safety showers and eye stations proximal to the work-station location. Do not breathe vapor. Avoid contact with eyes, skin and clothing. Keep tightly closed. Wash thoroughly after handling.

## Section 9 – Physical and Chemical Properties

<b>Physical States / Form:</b>	Solid
<b>Color:</b>	White crystals
<b>Odor:</b>	Thiol odor
<b>pH-Factor:</b>	4.3 (5% solution)
<b>Flashpoint:</b>	>110°C
<b>Specific Gravity:</b>	1.0 (H <sub>2</sub> O=1)
<b>Boiling Point:</b>	125 – 130°C
<b>Melting Point:</b>	42 – 43°C
<b>Solubility In Water:</b>	10-50 g/100mL

## Section 10 – Stability and Reactivity

<b>Substances To Be Avoided:</b>	Avoid alkali metals, bases, oxidizing agents, and reducing agents.
<b>Hazardous, Combustion, Or Decomposition Products:</b>	Carbon dioxide, carbon monoxide, hydrogen sulfide gas, and sulfur oxides toxic fumes.
<b>Conditions to Avoid:</b>	Heat, flames, ignition sources and incompatibles. Substance may decompose on exposure to moist air or water.
<b>Hazardous Polymerization:</b>	Will not occur.

## Section 11 – Toxicological Information

<b>Acute Effects</b>	
<b>Inhalation:</b>	May be harmful by inhalation. Substance is irritating to mucous membranes and upper respiratory tract.
<b>Eye Contact:</b>	May be harmful by eye contact.
<b>Skin Contact:</b>	May be harmful by skin absorption.
<b>Ingestion:</b>	May be harmful by ingestion.
<b>Target Organ Data:</b>	Central nervous system.
<b>RTECS Number:</b>	X08576500

### Toxicity Data:

Route	Organism	Dose	Reference
Intraperitoneal	Mouse	LD50: 169 mg/kg	JMCMAR 15,600,1972
Subcutaneous	Mouse	LD50: 333 mg/kg	ARZNAD 22,1434,1972
Intravenous	Mouse	LD50: 94 mg/kg	ARZNAD 22,1434,1972

Only selected registry of toxic effects of chemical substances (RTECS) data is presented here. See actual entry in RTECS for complete information.

<b>Additional Information:</b>	The product should be handled with the normal caution accorded to chemical handling. Additional harmful properties cannot be ruled out.
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## Section 12 – Ecological Information

No information available.

## Section 13 – Disposal Considerations

Observe all federal, state, and local environmental regulations. Contact a licensed professional waste disposal service to dispose of this material.

## Section 14 – Transport Considerations

Not regulated.

## Section 15 – Regulatory Information

<b>TSCA:</b> CAS No:	Listed on the TSCA inventory.
Health & Safety Reporting List:	None of the chemicals are listed.
Chemical Test Rules:	None of the chemicals in this product are under a Chemical Test Rule.
Section 12b:	None of the chemicals are listed.

TSCA Significant New Use Rule      None of the chemicals in this material have a SNUR under TSCA.

**SARA:** Section 302:                      None of the chemicals in this product have a TPQ.

          Codes:                                Immediate

**Clean Air Act:**                            This material does not contain any hazardous air pollutants, Class 1 Ozone depletors, or Class 2 Ozone depletors.

**Clean Water Act:**                        None of the chemicals in this product are listed as hazardous substances under the CWA, Priority Pollutants under the CWA, or Toxic Pollutants under the CWA.

**OSHA:**                                        None of the chemicals in this product are considered highly hazardous by OSHA.

**STATE:**                                        Not present on state lists from CA, PA, MN, MA, FL, or NJ.

**California No Significant Risk Level:**    None of the chemicals in this product are listed.

**European/International Information**

**Hazard Symbols:**

XN: Harmful

**Risk Phrases:**

R22: Harmful if swallowed  
R 36/37/38: Irritating to eyes, respiratory system and skin.

**Safety Phrases:**

S 37/39: Wear suitable gloves and eye/face protection  
S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

**Canada DSL/NDSL:**                        Listed.

          WHMIS:                                 This product has a WHMIS classification of D2B, D1B

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

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### Section 1 – Product and Company Information

**Reagent/Buffer Name:** 10X GpC Reaction Buffer (Component C)  
**Catalog Number:** E2014-2

**Company:** Zymo Research Corp.  
**Street Address:** 17062 Murphy Ave.  
**City, State, Zip Code, Country:** Irvine, CA 92614 US  
**Phone:** 949-679-1190  
**Fax:** 949-266-9452

### Section 2 – Ingredient Information/Composition

**Description:** Mixture of the substances listed below with nonhazardous additions.

Dangerous Components Name	CAS #	Formula	Percent
Sodium chloride	7647-14-5	NaCl	≤5%

### Section 3 – Hazard Identification

**NFPA Ratings (scale 0 - 4) :**  
Health = 1  
Fire = 1  
Reactivity = 1

**Potential Health Effects:**  
**Eye:** May cause eye irritation. Exposure to solid may cause pain and redness.  
**Skin:** May cause skin irritation. May be harmful if absorbed through the skin.  
**Ingestion:** May cause irritation of the digestive tract. May be harmful if swallowed. Ingestion of large amounts may cause nausea and vomiting, rigidity or convulsions. Continued exposure can produce coma, dehydration, and internal organ  
**Inhalation:** May cause respiratory tract irritation. May be harmful if inhaled.  
**Chronic:** No information found.

**Caution!** May cause eye, skin, and respiratory tract irritation. Hygroscopic (absorbs moisture from the air).

### Section 4 – First Aid Measures

In case of  
**Eye Contact:** Rinse eyes with plenty of water for at least 15 minutes and consult a physician.

**Skin Contact:** Wash off with soap and plenty of water. Remove contaminated clothing and shoes. Consult a physician.

<b>Serious Skin Contact:</b>	Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.
<b>Inhalation:</b>	Provide fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Consult a doctor.
<b>Ingestion:</b>	Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Rinse mouth with water. Consult a physician

## Section 5 – Fire Fighting Measures

<b>General Information:</b>	Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products. May be combustible at high temperatures.
<b>Fire Fighting Media and Instructions:</b>	Use water spray, dry chemical, carbon dioxide, or chemical foam.

## Section 6 – Accidental Release Measures

<b>Procedure(s) Of Personal Precaution(s) :</b>	Use personal protective equipment.
<b>Methods For Cleaning Up:</b>	Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

## Section 7 – Handling and Storage

<b>Handling:</b>	Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.
<b>Storage:</b>	Keep container tightly closed. Keep container in a cool, well-ventilated area.

## Section 8 – Exposure Controls / Personal Protection

<b>Engineering Controls:</b>	Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.
<b>Personal Protection Equipment:</b>	<p><b>Eyes:</b> Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.</p> <p><b>Skin:</b> Wear appropriate protective gloves to prevent skin exposure.</p> <p><b>Clothing:</b> Wear appropriate protective clothing to prevent skin exposure.</p> <p><b>Respirators:</b> A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.</p>
<b>OSHA Vacated PELs:</b>	No OSHA Vacated PELs are listed for this chemical.
<b>Exposure Limits:</b>	None listed

## Section 9 – Physical and Chemical Properties

<b>Physical State And Appearance:</b>	Solid
<b>Color:</b>	White
<b>Boiling Point:</b>	1461 °C at 760 mmHg
<b>Melting Point:</b>	801 °C

<b>Flash Point:</b>	Not available
<b>pH:</b>	5.0 - 8.0 (5% aq.sol. 20°C)
<b>Vapor Pressure:</b>	1 mm Hg at 865 °C
<b>Auto Igniting:</b>	Not available
<b>Solubility In Water:</b>	360 g/L (20°C)

## Section 10 – Stability and Reactivity

<b>Conditions of Avoid:</b>	High temperatures, incompatible materials, dust generation, exposure to moist air or water.
<b>Incompatibilities with Other Materials:</b>	Metals, strong oxidizing agents, strong acids, bromine trifluoride, nitro compounds, dichloromaleic anhydride + urea.
<b>Hazardous Decomposition Products:</b>	Hydrogen chloride, sodium oxide.
<b>Stability:</b>	Hygroscopic: absorbs moisture or water from the air.
<b>Polymerization:</b>	Will not occur

## Section 11 – Toxicological Information

<b>Toxicological Data:</b>	Route	Organism	Dose	Reference
	Intraperitoneal	Mouse	LD50: 2,602 mg/kg	COREAF 256,1043,1963
	Intraperitoneal	Rat	LD50: 2,600 mg/kg	VCVN1* -,36,1998
	Intravenous	Mouse	LD50: 645 mg/kg	ARZNAD 7,445,1957
	Oral	Mouse	LD50: 4 gm/kg	FRPPAO 27,19,1972
	Oral	Rat	LD50: 3,000 mg/kg	VCVN1* -,36,1998
	Subcutaneous	Mouse	LD50: 3 gm/kg	ARZNAD 7,445,1957

<b>Carcinogenicity:</b>	Not listed by ACGIH, IARC, NTP, or CA Prop 65.
<b>Epidemiology:</b>	The only adverse effect noted from occupational exposures have been mild nasal irritation with exposure to high dust levels and hypertension.

## Section 12 – Ecological Information

No data available.

## Section 13 – Disposal Considerations

Observe all federal, state, and local environmental regulations. Contact a licensed professional waste disposal service to dispose of this material. Do not dispose with household garbage.

## Section 14 – Transport Considerations

<b>DOT Regulations:</b>	Not a DOT controlled material (United States).
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## Section 15 – Regulatory Information

### Federal and State Regulations

<b>TSCA:</b>	Listed on the TSCA inventory.
<b>Health &amp; Safety Reporting List:</b>	None of the chemicals are on the Health & Safety Reporting List.
<b>Chemical Test Rules:</b>	None of the chemicals in this product are under a Chemical Test Rule.
<b>Section 12b:</b>	None of the chemicals are listed under TSCA Section 12b.
<b>TSCA Significant New Use Rule:</b>	None of the chemicals in this material have a SNUR under TSCA.
<b>CERCLA Hazardous Substances and corresponding RQs:</b>	None of the chemicals in this material have an RQ.
<b>SARA Section 302 Extremely Hazardous Substances:</b>	None of the chemicals in this product have a TPQ.
<b>SARA Codes:</b>	
<b>Section 313:</b>	No chemicals are reportable under Section 313
<b>Clean Air Act:</b>	This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.
<b>Clean Water Act:</b>	None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.
<b>OSHA:</b>	None of the chemicals in this product are considered highly hazardous by OSHA.
<b>STATE:</b>	Not present on state lists from CA, PA, MN, MA, FL, or NJ.
<b>California Prop 65:</b>	California No Significant Risk Level: None of the chemicals in this product are listed.

### European/International Regulations

<b>Hazard Symbols:</b>	Not available.
<b>Safety Phrases:</b>	S 24/25 Avoid contact with skin and eyes.
<b>Canada - DSL/NDL:</b>	Listed on Canada's DSL List.
<b>Canada – WHMIS:</b>	This product has a WHMIS classification of Not controlled. This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

## Section 16 – Other Information

The above information is believed to be correct, but does not purport to be all-inclusive and should be used only as a guide. Zymo Research shall not be held liable for any damage or other consequences resulting from handling or from contact with the above product. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall Zymo Research be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Zymo Research has been advised or the possibility of such damages. All materials supplied by Zymo Research Corp are intended to be used by trained professionals and are for research use only.



**ZYMO RESEARCH**  
*The Beauty of Science is to Make Things Simple*

## Material Safety Data Sheet

Zymo Research advises each customer or recipient of this MSDS to study it carefully to become aware of and understand the hazards associated with the product. The reader should consider consulting reference works or individuals who are experts in ventilation, toxicology, and fire prevention, as necessary or appropriate to use and understand the data contained in this MSDS.

To promote safe handling, each customer or recipient should: (1) notify its employees, agents, contractors and others whom it knows or believes will use this material or the information in this MSDS and any other information regarding hazards or safety; (2) furnish this same information to each of its customers for the product; and (3) request its customers to notify their employees, customers, and other users of the product of this information.

### Section 1 – Product and Company Information

**Reagent/Buffer Name:** 20X SAM (S-adenosylmethionine)  
**Catalog Number:** E2010-3

**Company:** Zymo Research Corp.  
**Street Address:** 17062 Murphy Ave.  
**City, State, Zip Code, Country:** Irvine, CA 92614 US  
**Phone:** 949-679-1190  
**Fax:** 949-266-9452

### Section 2 – Ingredient Information/Composition

**Description:** Mixture of the substances listed below with nonhazardous additions.

Dangerous Components Name	CAS #	EC No.	Formula	Percent
Glycerol	56-81-5	200-289-5	C <sub>3</sub> H <sub>8</sub> O <sub>3</sub>	≤10%

### Section 3 – Hazard Identification

**Target Organs:** Kidneys

**NFPA Ratings (scale 0 - 4) :** Health = 1  
Fire = 1  
Reactivity = 0

**HMIS Ratings (scale 0 – 4) :** Health = 1  
Fire = 1  
Reactivity = 0

**Potential Acute Health Effects:** Slightly hazardous in case of skin contact (irritant), eye contact (irritant), ingestion, inhalation.

**Potential Chronic Health Effects:** May be toxic to kidneys. Repeated or prolonged exposure to the substance can produce target organs damage.

### Section 4 – First Aid Measures

In Case of

**Eye Contact:** Flush contaminated eye(s) with copious volumes of water for at least 15 minutes. Get medical attention if eye(s) remain irritated.

<b>Skin Contact:</b>	Wash contaminated areas with soap and water as contaminated clothing is removed. Do not wear contaminated clothing until after it has been properly cleaned. Get medical attention if irritation develops.
<b>Ingestion:</b>	Wash out mouth with water provided person is conscious. Do NOT induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms appear.
<b>Inhalation:</b>	Remove victim to fresh air. Give oxygen if breathing becomes difficult. Should breathing stop-give artificial respiration. Get medical attention immediately.

## Section 5 – Fire Fighting Measures

<b>Flammability:</b>	May be combustible at high temperature.
<b>Extinguishing Media:</b>	Dry chemical powder, water spray, fog or foam.
<b>Products of Combustion:</b>	Carbon oxides (CO, CO <sub>2</sub> ), irritating and toxic fumes.
<b>Fire Hazards in Presence of Various Substances:</b>	Slightly flammable to flammable in presence of open flames and sparks, of heat, of oxidizing materials. Non-flammable in presence of shocks.
<b>Explosion Hazards in Presence of Various Substances:</b>	Explosive in presence of oxidizing materials.

## Section 6 – Accidental Release Measures

<b>General Information:</b>	Wear self-contained breathing apparatus, safety goggles, rubber boots, full suit, and protective gloves.
<b>Spills / Leaks:</b>	Absorb with an inert dry material and place in an appropriate waste disposal container for waste disposal. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Dispose of according to local and regional authority requirements. Ventilate area and wash spill site after material pickup is complete.

## Section 7 – Handling and Storage

<b>Handling:</b>	Keep away from sources of ignition, heat, and incompatibles such as oxidizing agents. Ground all equipment containing material. Wear suitable protective clothing. Do not ingest. Do not breathe gas/fumes/ vapor/spray.
<b>Storage:</b>	Keep container tightly closed in a cool, well-ventilated area. Hygroscopic.

## Section 8 – Exposure Controls / Personal Protection

Provide appropriate ventilation or local exhaust. Respiratory protection is not necessary for normal handling. Wear protective gloves, safety glasses, lab coat. Provide safety showers and eye stations proximal to the work-station location. Use a vapor respirator under conditions where exposure to the substance is apparent and/or engineering controls are not feasible. Be sure to use an approved/certified respirator or equivalent. Do not breathe vapor. Avoid contact with eyes, skin and clothing. Avoid prolonged or repeated exposure. Keep tightly closed. Wash thoroughly after handling.

<b>Exposure Limits:</b>	TWA: 10 (mg/m <sup>3</sup> ) from ACGIH (TLV) [United States] [1999] Inhalation Total. TWA: 15 (mg/m <sup>3</sup> ) from OSHA (PEL) [United States] Inhalation Total. TWA: 10 STEL: 20 (mg/m <sup>3</sup> ) [Canada] TWA: 5 (mg/m <sup>3</sup> ) from OSHA (PEL) [United States] Inhalation Respirable. Consult local authorities for acceptable exposure limits.
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## Section 9 – Physical and Chemical Properties

<b>Physical States / Form:</b>	Liquid
<b>Appearance:</b>	Colorless

<b>Melting Point:</b>	19°C
<b>Boiling Point:</b>	290°C
<b>Autoignition Temperature:</b>	369°C
<b>Flash Point:</b>	160°C
<b>Vapor Pressure:</b>	0 kPa 20°C
<b>Specific Gravity:</b>	1.261
<b>Vapor Density:</b>	3.1
<b>Solubility:</b>	Miscible in water and alcohol.

## Section 10 – Stability and Reactivity

<b>Stability:</b>	Stable.
<b>Substances To Be Avoided:</b>	Strong oxidizing agents, strong bases.
<b>Conditions To Be Avoided:</b>	Avoid contact with incompatible materials, excess heat and ignition, sources, moisture.
<b>Corrosivity:</b>	Non-corrosive in presence of glass.
<b>Hazardous Polymerization:</b>	Will not occur.

## Section 11 – Toxicological Information

<b>Acute Effects</b>	
<b>Inhalation:</b>	Inhalation of mist may cause respiratory tract irritation.
<b>Eye Contact:</b>	Causes eye irritation.
<b>Skin Contact:</b>	Causes skin irritation. May be absorbed through the skin.
<b>Ingestion:</b>	Low hazard. Low toxicity except with very large doses. Prolonged or repeated ingestion may affect the blood, endocrine system, respiratory system, and may cause kidney injury.
<b>Route Of Entry::</b>	Eye contact. Skin absorption.
<b>RTECS Number:</b>	MA8050000

### Toxicity Data:

Route	Organism	Dose	Reference
Oral	Rat	LD50: 12600 mg/kg	FEPR7 4,142,1945
Intraperitoneal	Rat	LD50: 4420 mg/kg	RCOCB8 56,125,1987
Subcutaneous	Rat	LC50: 100 mg/kg	NIIRDN 6,215,1982
Intravenous	Rat	LD50: 5566 mg/kg	ARZNAD 26,1581,1976
Oral	Mouse	LD50: 4090 mg/kg	FRZKAP (6),56,1977
Intraperitoneal	Mouse	LC50: 8700 mg/kg	ARZNAD 28,1579,1978
Subcutaneous	Mouse	LC50: 91 mg/kg	NIIRDN 6,215,1982
Intravenous	Mouse	LD50: 4250 mg/kg	JAPMA8 39,583,1950
Oral	Rabbit	LD50: 27 gm/kg	DMDJAP 31,276,1959
Intravenous	Rabbit	LD50: 53 gm/kg	NIIRDN 6,215,1982
Oral	Guinea Pig	LC50: 7750 mg/kg	JHTAB 23,259,1941

Only selected registry of toxic effects of chemical substances (RTECS) data is presented here. See actual entry in RTECS for complete information.

<b>Additional Information:</b>	The product should be handled with the normal caution accorded to chemical handling. Additional harmful properties cannot be ruled out.
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## Section 12 – Ecological Information

**Environmental Toxicity:** This material is not expected to be toxic to aquatic life.

## Section 13 – Disposal Considerations

Observe all federal, state, and local environmental regulations. Contact a licensed professional waste disposal service to dispose of this material. Do not dispose with household garbage.

## Section 14 – Transport Considerations

**DOT Classification:** Not a DOT controlled material (United States).

## Section 15 – Regulatory Information

### Federal and State Regulations:

**TSCA 8(b) Inventory:** Glycerine

### California Proposition 65 Warnings:

California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: No products were found.

California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: No products were found.

### Other Regulations:

**OSHA:** Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

**EINECS:** This product is on the European Inventory of Existing Commercial Chemical Substances.

**AICS:** Listed

**Canadian Domestic Substance List (DSL):** Listed

**National Inventory (ENCS):** Listed

**National Inventory (KECI):** Listed

**National Inventory (PICCS):** Listed

### Other Classifications:

**DSCL (EEC):** N/A

**Canada – WHMIS:** Not controlled under WHMIS (Canada).

## Section 16 – Other Information

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