ZYMO RESEARCH

The Beauty of Science is to Make Things Simple

Material Safety Data Sheet

Product Contents:

Pico Methyl-Seq™ Library Prep Kit (D5455, D5456)
Lightning Conversion Reagent
M-Binding Buffer
M-Wash Buffer
L-Desulphonation Buffer
DNA Elution Buffer
PrepAmp Polymerase (13 U/µL)
PrepAmp Buffer (5X)
PrepAmp Primer (40 µM)
PrepAmp Pre-Mix
DNase/RNase-Free Water
DNA Binding Buffer
DNA Wash Buffer
LibraryAmp Master Mix (2X)
LibraryAmp Primers (10 µM)
Index Primer Sets - 6 Sets (10 µM)

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Section 1 – Product and Company Information

Reagent/Buffer Name: Lightning Conversion Reagent
Catalog Number: D5030-1, D5032-1

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 #	Percent
Ammonium bisulfite	10192-30-0	<70%

Section 3 – Hazard Identification

Potential Health Effects:
Inhalation: May be harmful if inhaled. May cause respiratory tract irritation.
Skin: May be harmful if absorbed through skin. May cause skin irritation.
Eyes: May cause eye irritation.
Ingestion: May be harmful if swallowed.

NFPA Ratings (scale 0 - 4) :
Health = 3
Fire = 0
Reactivity = 0

HMIS Ratings (scale 0 – 4) :
Health = 3
Fire = 0
Reactivity = 0

Section 4 – First Aid Measures

In case of

Eye Contact: Rinse eyes with plenty of water for at least 15 minutes. If irritation persists, get medical attention.

Skin Contact: Flush contaminated areas with water for at least 15 minutes. If irritation persists, get medical attention.

Inhalation: Provide fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion: Rinse mouth with water. Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

Section 5 – Fire Fighting Measures

Extinguishing Media: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Specific Hazard(s) : Emits hazardous fumes under fire conditions.

Section 6 – Accidental Release Measures

Procedure(s) Of Personal Precaution(s) : Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation.

Environmental Protection: Do not let product enter drains. Discharge into the environment must be avoided.

Methods For Cleaning Up: Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal. Ventilate area.

Section 7 – Handling and Storage

Handling: Avoid contact with skin and eyes Avoid breathing vapors, mist or gas. Provide appropriate exhaust ventilation. Avoid prolonged or repeated exposure.

Storage: Keep container tightly closed in a dry and well-ventilated place.

Section 8 – Exposure Controls / Personal Protection

Engineering Controls: Safety shower and eye bath. Use only in a chemical fume hood.

Personal Protection Equipment: Lab coat. Compatible chemical-resistant gloves. Safety glasses. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

General Hygiene Measures: Wash contaminated clothing before reuse. Wash thoroughly after handling.

Exposure Limits:

Country	Source	Type	Value
USA	ACGIH	TWA	Not Available
USA	OSHA	PEL	Not Available

Section 9 – Physical and Chemical Properties

Physical State And Appearance:	Liquid
Chemical Formula:	NH_4HSO_3
Boiling Point:	Not available
Melting Point:	Not available
Freezing Point:	Not available
Flash Point:	Not available
Auto Igniting:	Not available
Vapor Pressure:	Not available
Vapor Density:	Not available
SG/Density:	Not available
Flammability:	Not available
Autoignition Temp:	Not available
Solubility:	Not available

Section 10 – Stability and Reactivity

Materials To Avoid:	Strong oxidizing agents.
Stability:	Stable

Section 11 – Toxicological Information

RTECS No.	Not available
Potential Health Effects:	**Inhalation** May be harmful if inhaled. May cause respiratory tract irritation. **Ingestion** May be harmful if swallowed. **Skin** May be harmful if absorbed through skin. May cause skin irritation. **Eyes** May cause eye irritation.
Signs And Symptoms Of Exposure:	To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated. Use appropriate procedures and precautions to prevent or minimize exposure.
Acute Toxicity:	**Oral LD50:** No data available **Inhalation LC50:** No data available **Dermal LD50:** No data available

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. Do not allow product to reach sewage system.

Section 14 – Transport Considerations

DOT Regulations:

Identification Number	UN2693
DOT Class	8
Packaging Group	III
Proper Shipping Name	Bisulphites, Aqueous Solution

IATA:

IATA Class	8
Identification Number	UN2693
Packaging Group	III
Proper Shipping Name	Bisulphites, Aqueous Solution

Section 15 – Regulatory Information

TSCA (Toxic Substances Control Act):	Listed
SARA 302:	Not listed
SARA 313:	Not listed
EINECS:	Not available
Canadian Domestic Substance List (DSL/NDSL):	Listed

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Section 1 – Product and Company Information

Reagent/Buffer Name: M-Binding Buffer
Catalog Number: D5001-3, D5002-3, D5005-3, D5006-3, D5040-3

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	Concentration
Guanidine Hydrochloride	50-01-1	200-002-3	CH_6N_3Cl	≥ 3M

Section 3 – Hazard Identification

Emergency Overview: OSHA Hazards: Target Organ Effect, Toxic by ingestion, Irritant

Target Organs: Bone marrow, Nerves.

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

HMIS Ratings (scale 0 – 4) :
Health = 2
Fire = 0
Physical Hazard = 0

Potential Health Effects: Harmful if inhaled or absorbed through skin. Toxic if swallowed. Causes eye irritation.

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 for at least 15 minutes as contaminated clothing is removed. Get medical attention if area remains irritated. Do not wear contaminated clothing until after it has been properly cleaned.
Ingestion:	Never give anything by mouth to an unconscious person. Rinse mouth with water. Get immediate medical attention.
Inhalation:	Remove victim to fresh air. Give oxygen if breathing becomes difficult. Should breathing stop, give artificial respiration.

Section 5 – Fire Fighting Measures

Extinguishing Media:	Water spray. Carbon dioxide, dry chemical powder, or alcohol-resistant foam.
Special Fire Fighting Procedures:	Wear self-contained breathing apparatus and protective garments.

Section 6 – Accidental Release Measures

General Information:	Wear self-contained breathing apparatus, chemical safety goggles, rubber boots, and heavy rubber gloves.
Spills / Leaks:	Avoid dust formation. Avoid breathing dust. Do not let product enter drains. Ventilate area and wash spill site after material pickup is complete.

Section 7 – Handling and Storage

Handling:	Avoid formation of dust and aerosols. Avoid contact with skin and eyes. Provide appropriate exhaust ventilation.
Storage:	Store tightly closed in a dry and well-ventilated place.

Section 8 – Exposure Controls / Personal Protection

Wear appropriate NIOSH (US) or CEN (EU)-Approved respirator, protective gloves, safety goggles. Safety shower and eye both. Mechanical exhaust required. Keep tightly closed. Wash thoroughly after handling. Do not get in contact with eyes, skin or on clothing. Do not inhale vapor. Severe eye irritant.

Section 9 – Physical and Chemical Properties

Physical States / Form:	Liquid
Color:	Colorless
pH-Factor:	4.5 - 6 at 573 g/l at 25 °C (77 °F)
Flashpoint:	N/A
Melting Point:	180 - 185 °C (356 - 365 °F)
Solubility In Water:	573 g/l at 20 °C (68 °F)

Section 10 – Stability and Reactivity

Substances To Be Avoided:	Strong oxidizing agents.
Hazardous, Combustion, Or Decomposition Products:	Carbon oxides, nitrogen oxides, and hydrogen chloride gas.

Section 11 – Toxicological Information

Acute Effects

Inhalation:	May be harmful by inhalation. Causes respiratory tract irritation.
Eye Contact:	Causes severe eye irritation.
Skin Contact:	Causes skin irritation, harmful by skin absorption.
Ingestion:	Toxic if swallowed.
Target Organ Data:	Bone marrow, nerves.
Chronic Effects:	IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC. ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH. NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP. OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
RTECS Number:	MF4300000
Toxicity Data:	Oral Rat LD50: 475 mg/kg Only selected registry of toxic effects of chemical substances (RTECS) data is presented here. See actual entry in RTECS for complete information.
Additional Information:	The product should be handled with the normal caution accorded to chemical handling. Additional harmful properties cannot be ruled out.

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. Do not dispose with household garbage. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Section 14 – Transport Considerations

DOT (US)	Not dangerous goods
IMDG	Not dangerous goods
IATA	Not dangerous goods

Section 15 – Regulatory Information

OSHA Hazards:	Irritant, Target Organ Effect, Toxic by ingestion
DSL Status:	All components of this product are on the Canadian DSL list.
SARA 302 Components **SARA 302:**	No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components **SARA 313:**	This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.	
SARA 311/312 Hazards:	Acute Health Hazard, Chronic Health Hazard	
Massachusetts Right To Know Components:	No components are subject to the Massachusetts Right to Know Act.	
Pennsylvania Right To Know Components:	Guanidinium chloride	CAS-No. 50-01-1
New Jersey Right To Know Components:	Guanidinium chloride	CAS-No. 50-01-1
California Prop. 65 Components:	This product does not contain any chemicals known to State of California to cause cancer, birth, or any other reproductive defects.	

Section 16 – Other Information

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Section 1 – Product and Company Information

Reagent/Buffer Name: M-Wash Buffer
Catalog Number: D5001-4, D5002-4, D5007-4, D5040-4

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 #	EINEC No.	Formula	Concentration
N/A	N/A	N/A	N/A	N/A

According to the OSHR 29 CFR§1910_1200, a mixture that contains less than one percent by weight or volume of a non-carcinogenic hazardous component is not considered hazardous, unless there is evidence to the contrary. However, we recommend the use of gloves, lab coats and eye protection when working with these or any chemical reagents.

Section 3 – Hazard Identification

Not applicable.

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.

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.

Ingestion: Wash out mouth with water provided person is conscious.

Inhalation: Remove to fresh air. Give oxygen if breathing becomes difficult. Should breathing stop-give artificial respiration. Call a physician.

Section 5 – Fire Fighting Measures

Extinguishing Media: Noncombustible. Use extinguishing media appropriate to surrounding fire conditions.

Special Fire Fighting Procedures: Wear self-contained breathing apparatus and protective garments to prevent contact with skin and eyes.

Section 6 – Accidental Release Measures

General Information: Wear self-contained breathing apparatus, chemical safety goggles, rubber boots, and heavy rubber gloves.

Spills / Leaks: Absorb with sand or vermiculite and place in a bag for waste disposal. Ventilate area and wash spill site after material pickup is complete.

Section 7 – Handling and Storage

Storage: Store tightly closed at room temperature.

Section 8 – Exposure Controls / Personal Protection

Wear appropriate NIOSH / MSHA-Approved respirator, chemical resistant gloves, chemical safety goggles. Safety shower and eye both. Do not get into contact with eyes, skin and clothing. Wash hands thoroughly after handling. Store in a cool dry place.

Section 9 – Physical and Chemical Properties

Physical States / Form: Liquid

Appearance: Colorless

Section 10 – Stability and Reactivity

Substances To Be Avoided: N/A

Hazardous, Combustion, Or Decomposition Products: N/A

Hazardous Polymerization: Will not occur.

Section 11 – Toxicological Information

Toxicity Data: N/A

Acute Effects

Inhalation: May be harmful by inhalation.

Eye Contact: May cause eye irritation.

Skin Contact: May cause skin irritation.

Ingestion: May be harmful if ingested.

Prolonged Exposure: N/A

Chronic Effects: N/A

RTECS Number: N/A

Additional Information: The product should be handled with the normal caution accorded to chemical handling. Additional harmful properties cannot be ruled out.

Section 12 – Ecological Information

No information available.

Section 13 – Disposal Considerations

No information available.

Section 14 – Transport Considerations

No information available.

Section 15 – Regulatory Information

No information available.

Section 16 – Other Information

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Section 1 – Product and Company Information

Reagent/Buffer Name: L-Desulphonation Buffer (Component A)
Catalog Number: D5030-5, D5031-5, D5046-5

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 #	EINEC No.	Formula	Concentration
Sodium Hydroxide	1310-73-2	215-185-5	NaOH	200mM to 2M

Section 3 – Hazard Identification

Emergency Overview: OSHA Hazards: Corrosive

HMIS Classification:
Health hazard: 3
Flammability: 0
Physical hazards: 1

NFPA Ratings (scale 0 - 4) :
Health = 3
Fire = 0
Reactivity = 1

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.

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

Ingestion: If swallowed, do NOT induce vomiting. Rinse mouth with water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation:	Remove victim to fresh air. Give oxygen if breathing becomes difficult. Should breathing stop-give artificial respiration. Get medical attention.

Section 5 – Fire Fighting Measures

Extinguishing Media:	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Special Fire Fighting Procedures:	Wear self-contained breathing apparatus and protective garments to prevent contact with skin and eyes.

Section 6 – Accidental Release Measures

General Information:	Provide adequate ventilation. Use personal protective equipment. Avoid breathing vapors, mist or gas. Evacuate personnel to safe areas.
Spills / Leaks:	Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

Section 7 – Handling and Storage

Handling:	Wash thoroughly after handling. Do not get in eyes, on skin, or on clothing. Avoid ingestion and inhalation. Provide adequate ventilation.
Storage:	Keep container tightly closed in a cool, well-ventilated area. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Section 8 – Exposure Controls / Personal Protection

Provide appropriate ventilation or local exhaust. Wear protective gloves, safety glasses, lab coat. Provide safety showers and eye stations proximal to the work-station location. 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.

Exposure Limits:	ACGIH: C 2 mg/m^3 OSHA Final-PELs: TWA 2 mg/m^3 Consult local authorities for acceptable exposure limits.

Section 9 – Physical and Chemical Properties

Physical States / Form:	Liquid
Color:	Colorless
pH-Factor:	N/A
Boiling Point:	N/A
Melting Point:	N/A
Flash Point:	N/A
Ignition Temperature:	N/A
Solubility In Water:	Soluble

Section 10 – Stability and Reactivity

Substances To Be Avoided: Acids; organic materials; metals-corrosive to metals.

Hazardous, Combustion, Or Decomposition Products: Hazardous decomposition products formed under fire conditions. - Sodium oxides

Section 11 – Toxicological Information

Acute Effects

Inhalation: May be harmful by inhalation. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.

Eye Contact: Causes eye irritation.

Skin Contact: Causes skin irritation. May be harmful by skin adsorption.

Ingestion: May be harmful if swallowed. Causes burns.

Prolonged Exposure: N/A

Chronic Effects: N/A

Acute Toxicity Data: N/A

Irritation and Corrosion: N/A

Additional Information: The product should be handled with the normal caution accorded to chemical handling. Additional harmful properties cannot be ruled out.

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. Do not dispose with household garbage. Do not allow product to reach sewage system.

Section 14 – Transport Considerations

DOT:
Shipping Name: Sodium Hydroxide, Solution
Hazard Class: 8
UN/NA: UN1824
Packing Group: III
Marine pollutant: No
Poison Inhalation Hazard: No

IATA:
Shipping Name: Sodium Hydroxide, Solution
Hazard Class: 8
UN/NA: UN1824
Packing Group: III

Canada TDG:
Shipping Name: Sodium Hydroxide, Solution
Hazard Class: 8
UN/NA: UN1824
Packing Group: III

Section 15 – Regulatory Information

OSHA Hazards:		Corrosive
SARA:	Section 313:	This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.
	Section 302:	No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.
	SARA 311/312 Hazards:	Acute Health Hazard
STATE:		Present on state lists from CA, PA, MA, NJ.
California Prop. 65 Components		This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.
European Labeling		
Hazard Symbols:		C
Risk Phrases:		R 35 Causes severe burns.
Safety Phrases:		S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S 37/39 Wear suitable gloves and eye/face protection. S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
WGK (Water Danger / Protection):		CAS No.: 1310-73-2: 1
Canada:		Listed on Canada's DSL/NDSL List. This product has a WHMIS Classification of E. Listed on Canada's Ingredient Disclosure List.

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Section 1 – Product and Company Information

Reagent/Buffer Name: L-Desulphonation Buffer (Component B)
Catalog Number: D5030-5, D5031-5, D5046-5

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
Isopropanol	67-63-0	CH3CH(OH)CH3	<30%

Section 3 – Hazard Identification

Emergency Overview: Hazardous in case of eye contact (irritant), of inhalation. Slightly hazardous in case of skin contact (irritant, sensitizer, permeator), of ingestion.

Target Organs: The substance may be toxic to kidneys, liver, skin, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

NFPA Ratings (scale 0 - 4) :
Health = 1
Fire = 3
Reactivity = 0

HMIS Ratings (scale 0 – 4) :
Health = 2
Fire = 3
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:	Flush contaminated areas with large volumes of water and wash with soap for at least 15 minutes as contaminated clothing are removed. Get medical attention if area remains irritated. Do not wear contaminated clothing until after it has been properly cleaned.
Ingestion:	Wash the mouth out with water if the person is conscious. Get immediate medical attention.
Inhalation:	Remove victim to fresh air. Give oxygen if breathing becomes difficult. Should breathing stop, give artificial respiration. Get medical attention.

Section 5 – Fire Fighting Measures

Flammability:	Flammable.
Extinguishing Media:	Water spray, carbon dioxide, dry chemical powder, or appropriate foam.
Products of Combustion:	Carbon oxides (CO, CO2).
Fire Hazards	Highly flammable in presence of open flames and sparks, of heat. Flammable in presence of oxidizing materials. Non-flammable in presence of shocks.
Explosion Hazards	Explosive in presence of open flames and sparks, of heat.
Unusual Fire And Explosion Hazards:	Vapor may travel considerable distance to source of ignition and flash back. CAUTION: MAY BURN WITH NEAR INVISIBLE FLAME. When heated to decomposition it emits acrid smoke and fumes.

Section 6 – Accidental Release Measures

Wear self-contained breathing apparatus, chemical safety goggles, rubber boots, and heavy rubber gloves. Absorb with an inert dry material and place in an appropriate waste disposal container. Use non-sparking tools. Ventilate area and wash spill site after material pickup is complete. Keep away from heat. Keep away from sources of ignition.

Section 7 – Handling and Storage

Handling:	Do not ingest. Do not breathe gas/fumes/ vapor/spray. Avoid contact with eyes. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment.
Storage:	Store tightly closed in a cool, well-ventilated area. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material.

Section 8 – Exposure Controls / Personal Protection

Wear appropriate NIOSH / MSHA-Approved respirator, chemical resistant gloves, chemical safety goggles. Safety shower and eye bath. Mechanical exhaust required. Keep tightly closed. Use nonsparking tools. Wash contaminated clothing before reuse. Avoid prolonged or repeated exposure. Store in a cool dry place. Keep away from heat, sparks, and open flame. Wash thoroughly after handling. Do not get in contact with eyes, skin or on clothing. Do not inhale vapor. Severe eye irritant.

Exposure Limits:	TWA: 400 STEL: 500 (ppm) from OSHA (PEL) [United States] TWA: 980 STEL: 1225 (mg/m3) from OSHA (PEL) [United States] TWA: 200 STEL: 400 (ppm) from ACGIH (TLV) [United States] [1999]

Section 9 – Physical and Chemical Properties

Boiling Point:	82.3^{o}C
Melting Point:	-88.5°C (-127.3°F)
Freezing Point:	-89°C - -86°C
Auto-ignition Temperature:	399°C (750.2°F)

Flash Point:	Closed Cup: 11.667°C (53°F) - 12.778 °C (55 °F) (TAG)
Vapor Density:	2.07
Vapor Pressure:	4.4 kPa (at 20°C)
Evaporation Rate (Butyl Acatate=1):	1.44
Solubility In Water:	Fully miscible
Specific Gravity (Water=1):	0.787

Section 10 – Stability and Reactivity

Stability:	Stable.
Substances To Be Avoided:	Reactive with oxidizing agents, acids, alkalis.
Conditions To Avoid:	Heat, Ignition sources, incompatible materials
Hazardous, Combustion, Or Decomposition Products:	Unknown.
Hazardous Polymerization:	Will not occur.

Section 11 – Toxicological Information

Acute Effects

Inhalation:	May be harmful by inhalation. Material is irritating to mucous membranes and upper respiratory tract.
Eye Contact:	Causes severe eye irritation.
Skin Contact:	Causes skin irritation, harmful if absorbed through skin.
Ingestion:	Harmful if swallowed.
Other:	Can cause CNS depression. Narcotic effect. Damage to the heart.

Toxicity Data:

Route	Organism	Dose
Oral	Human	LD50 = 5-15 g/kg
Oral	Rat	LD50 = 5,045 mg/kg acute
Skin	Rabbit	LD50 = 12,800 mg/kg acute
Oral	Mouse	LD50 = 3,600 mg/kg
Inahalation	Rat	LC50 = 16,000 ppm (8 hour) acute

RTECS Number:	NT8050000
Additional Information:	The product should be handled with the normal caution accorded to chemical handling. Additional harmful properties cannot be ruled out**.**

Section 12 – Ecological Information

Not 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

US DOT: CLASS 3: Flammable liquid.
UNNA: 1219 : Isopropyl Alcohol PG: II

Section 15 – Regulatory Information

TSCA : TSCA 8(b) inventory: Isopropyl alcohol
TSCA 4(a) final testing order: Isopropyl alcohol
TSCA 8(a) IUR: Isopropyl alcohol
TSCA 8(d) H and S data reporting: Isopropyl alcohol: Effective date: 12/15/86 Sunset Date: 12/15/96
TSCA 12(b) one time export: Isopropyl alcohol

SARA: SARA 313 toxic chemical notification and release reporting: Isopropyl alcohol

California Proposition 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.

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.

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 (EINECS No.200-661-7).

WHMIS Classification: B2, D2B

Other Regulatory Requirement: DSL list

DSCL (EEC): R11- Highly flammable.
R36- Irritating to eyes.
R67- Vapors may cause drowsiness and dizziness.
S7- Keep container tightly closed.
S16- Keep away from sources of ignition – No smoking.
S24/25- Avoid contact with skin and eyes.
S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

Section 16 – Other Information

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Section 1 – Product and Company Information

Reagent/Buffer Name: L-Desulphonation Buffer (Component C)
Catalog Number: D5030-5, D5031-5, D5046-5

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
Ethanol 190 Proof, Ethanol, Undenatured; Ethyl Alcohol, Anhydrous	Mixture [Ethanol 200 Proof (95%): 64-17-5, Water (5%):7732-18-5]	N/A	<30%

Section 3 – Hazard Identification

NFPA Ratings (scale 0 - 4) :
Health = 1
Fire = 3
Reactivity = 0

HMIS Ratings (scale 0 – 4) :
Health = 1
Fire = 3
Reactivity = 0

Hazard Category: Acute, Chronic, Fire

Hazardous Identification Information: Poison. Danger. Flammable. May be fatal if swallowed. Vapor harmful. Harmful if inhaled or absorbed through skin. Affects Nervous Central System. Causes eyes, skin and respiratory tract irritation. May affect liver, blood, reproductive system.

Route(s) of Entry: Inhalation, eye, ingestion, skin

Acute and Chronic Heal Hazards:
Ingestion: Can cause nausea, vomiting, intoxication, depression of the Central Nervous System, diarrhea. In acute cases can cause death.
Inhalation: May cause irritation to the mucous membranes of the upper respiratory tract.

Eyes: Liquid and vapor may cause irritation. Splashes may cause temporary pain and blurred vision.
Skin: On prolonged contact, may cause irritation, cracking, flaking and defatting of skin.

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.

Skin Contact: Rinse contaminated areas with large volumes of water for at least 15 minutes as contaminated clothing is removed. Get medical attention if area remains irritated. Do not wear contaminated clothing until after it has been properly cleaned.

Ingestion: If conscious, have victim drink water or milk to dilute. Do NOT induce vomiting unless directed to do so by medical personnel. Get medical aid immediately. Never give anything by mouth to an unconscious person.

Inhalation: Remove victim to fresh air. Give oxygen if breathing becomes difficult. Should breathing stop-give artificial respiration. Get medical aid if cough or other symptoms appear.

Section 5 – Fire Fighting Measures

Flash Point: 16.66 ^{o}C (61.99 ^{o}F)

Lower Explosive Limit: 3.3 vol %

Upper Explosive Limit: 19.0 vol %

Extinguishing Media: Use alcohol foam, dry chemical, CO_2. Water may be ineffective, but should be used to keep fire-exposed container cool.

Special Fire Fighting Procedures: Wear self-contained breathing apparatus and protective garments to prevent contact with skin and eyes.

Fire Hazards in Presence of Various Substances: Highly flammable in presence of open flames and sparks, of heat. Slightly flammable to flammable in presence of oxidizing materials. Non-flammable in presence of shocks, of reducing materials, of combustible materials, of organic materials, of metals, of acids, of alkalis.

Products of Combustion: These products are carbon oxides (CO, CO2).

Explosion Hazards: Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. Can release vapors that form explosive mixtures at temperatures above the flashpoint. Containers may explode in the heat of a fire.

Section 6 – Accidental Release Measures

Spills / Leaks: Ventilate area. Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Remove all sources of ignition. Use a spark-proof tool. A vapor suppressing foam may be used to reduce vapors. Wear appropriate personal protective equipment.

Section 7 – Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Keep container tightly closed in a cool, dry, and well-ventilated place. Keep away from heat, sparks, and flame.

Section 8 – Exposure Controls / Personal Protection

Wear appropriate approved/certified respirator. Chemical resistant gloves. Chemical safety goggles. Lab coat. Safety shower and eye both. Mechanical exhaust required. Keep tightly closed. Wash thoroughly after handling. Do not get in contact with eyes, skin or on clothing. Do not inhale vapor. Severe eye irritant.

Chemical Name	OSHA - Final PELs	ACGIH	NIOSH
Ethyl alcohol	1000 ppm TWA; 1900 mg/m3 TWA	1000 ppm TWA	1000 ppm TWA; 1900 mg/m3 TWA 3300 ppm IDLH
Water	none listed	none listed	none listed

Section 9 – Physical and Chemical Properties

Physical States / Form: Liquid

Color: Colorless

Odor: Mild

Melting/Freezing Point: -114.1 ^{o}C

Boiling Point: 78 ^{o}C

Flashpoint: 16.66 ^{o}C (61.99 ^{o}F)

Vapor Pressure: 59.3 mm Hg at 25 ^{o}C

pH: Not available

Specific Gravity: 0.790 at 20°C

Solubility In Water: Miscible

Section 10 – Stability and Reactivity

Chemical Stability: Stable.

Conditions To Avoid: Incompatible materials, ignition sources, excess heat, oxidizers.

Substances To Be Avoided: Strong oxidants, hydrazine, alkali metals, peroxides, silver salts, acid chlorides, metal hydrates, and others.

Hazardous Decomposition Products: Carbon dioxide, carbon monoxide.

Hazardous Polymerization: Will not occur.

Section 11 – Toxicological Information

LD50 Oral Rat: 7060 mg/kg

LC50 Inhalation Rat: 20,000ppm/10H

LD50 Oral Rabbit: 6300 mg/kg

Carcinogenicity: Not listed by ACGIH, IARC, NTP, or CA Prop 65

Reproductive Effects: Ethanol has been linked to birth defects in humans.

Section 12 – Ecological Information

Water:	Does not bioaccumulate, readily biodegrades, evaporates to modern extent.
Soil:	Leaches into groundwater, readily biodegrades, quickly evaporates.
Air:	Readily degrades by reaction with photochemically produced hydroxyl radicals. Readily removed by dry and wet deposition.

Section 13 – Disposal Considerations

Dispose of in a manner consistent with federal, state, and local regulations.

Section 14 – Transport Considerations

Domestic (Land, DOT):	Shipping Name: Ethanol Hazard Class: 3 UN/NA: UN3065 Packing Group: II
International (Water, I.M.O.):	Shipping Name: Ethanol Hazard Class: 3.2 UN/NA: UN3065 Packing Group: II

Section 15 – Regulatory Information

Federal and State Regulations **TSCA Inventory:**	CAS# 64-17-5: Listed CAS# 7732-18-5: Listed
Health & Safety Reporting List:	None
Chemical Test Rules:	None
Section 12b:	None
TSCA Significant New Use Rule:	None
CERCLA Hazardous Substances and corresponding RQs:	None
SARA Section 302:	None
SARA Codes:	CAS # 64-17-5: acute, chronic, flammable
Section 313:	None
Clean Air Act:	Hazardous air pollutants: None
	Class 1 Ozone Depletors: None
	Class 2 Ozone Depletors: None
Clean Water Act:	Hazardous Substances: None
	Priority Pollutants: None
	Toxic Pollutants: None
OSHA:	None

STATE:	CAS# 64-17-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts. CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.
California Prop 65:	WARNING: This product contains Ethyl alcohol, a chemical known to the state of California to cause developmental reproductive toxicity. California No Significant Risk Level: None of the chemicals in this product are listed.
European/International Regulations **Hazard Symbols:**	F
Risk Phrases:	R11
Safety Phrases:	S16, S7
Canada - DSL/NDSL:	CAS# 64-17-5: Listed CAS# 7732-18-5: Listed
Canada – WHMIS:	WHMIS classification of B2, D2A.
Canadian Ingredient Disclosure List:	CAS# 64-17-5: Listed

Section 16 – Other Information

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Section 1 – Product and Company Information

Reagent/Buffer Name: DNA Elution Buffer
Catalog Number: D3004-4-1, D3004-4-4, D3004-4-10, D3004-4-16, D5101-6-1, D3004-4-50

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 #	EINEC No.	Formula	Percent
Tris(hydroxymethyl)aminomethane / Hydrochloric Acid	1185-53-1	214-684-5	C4H11NO3.HCL	≤ 1%
Ethylenediaminetetraacetic Acid, pH 8.0	6381-92-6	205-358-3	C10H14N2Na2O8•2H2O	≤ 1%

According to OSHA 29CFR1910.1200, a mixture that contains less than 1% of a component classified as hazardous or less than 0.1% of a component classified as carcinogenic is not considered hazardous unless there is evidence to the contrary. However, we recommend the use of gloves, lab coats and eye protection when working with these or any chemical reagents.

Section 3 – Hazard Identification

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

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

OSHA Hazard: No known OSHA hazards

Potential Acute Health Effects:
Eyes: May cause eye irritation.
Inhalation: May be harmful if inhaled. May cause respiratory tract irritation.
Ingestion: May be harmful if swallowed.
Skin: May be harmful if absorbed through skin. May cause skin irritation.

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 large volumes of soap and water.
Ingestion:	Wash out mouth with water provided person is conscious.
Inhalation:	Remove victim to fresh air. Give oxygen if breathing becomes difficult. Should breathing stop, give artificial respiration.

Section 5 – Fire Fighting Measures

Extinguishing Media:	Noncombustible. Use extinguishing media appropriate to surrounding fire conditions.
Special Fire Fighting Procedures:	Wear self-contained breathing apparatus and protective garments to prevent contact with skin and eyes.

Section 6 – Accidental Release Measures

General Information:	Wear self-contained breathing apparatus, chemical safety goggles, rubber boots, and heavy rubber gloves. Avoid breathing vapors, mist or gas.
Spills / Leaks:	Keep in suitable, closed containers for disposal.

Section 7 – Handling and Storage

Storage:	Store tightly closed in a dry and well-ventilated place.

Section 8 – Exposure Controls / Personal Protection

Whenever workplace conditions warrant a respirator use, wear tested and approved NIOSH (US) or CEN (EU) respirators and components. Wear protective gloves and safety goggles. Provide safety shower and eyewash station. Keep tightly closed. Wash thoroughly after handling.

Section 9 – Physical and Chemical Properties

Physical States / Form:	Liquid	
Color:	Colorless	
pH-Factor:	(20°C)	8.0
Specific Gravity:	(20°C)	0.990 g/cm^2
Solubility In Water:	(20°C)	Soluble

Section 10 – Stability and Reactivity

Substances To Be Avoided:	Strong oxidizing agents.
Hazardous, Combustion, Or Decomposition Products:	Hazardous decomposition products formed under fire conditions. Nature of decomposition products not known.

Section 11 – Toxicological Information

Acute Effects

Inhalation:	May be harmful by inhalation. May cause respiratory tract irritation.
Eye Contact:	May cause eye irritation.
Skin Contact:	May cause skin irritation. May cause skin irritation.
Ingestion:	May be harmful if swallowed.
Signs and Symptoms of Exposure:	Caution! The toxicological properties of this mixture have not been fully investigated. Follow good laboratory practices when handling.
RTECS Number:	Mixture not listed.
Additional Information:	The product should be handled with the normal caution accorded to chemical handling. Additional harmful properties cannot be ruled out.

Section 12 – Ecological Information

No information available.

Section 13 – Disposal Considerations

Observe all federal, state, and local environmental regulations.

Section 14 – Transport Considerations

DOT Regulations:	Not dangerous goods. Not regulated.
IMDG:	Not dangerous goods. Not regulated.
IATA:	Not dangerous goods. Not regulated.

Section 15 – Regulatory Information

SARA:

Section 302	No products were found.
Section 313	No products were found.
SARA 311/312 Hazards	No SARA Hazards.
California Prop. 65 Components:	This product does not contain any chemicals known to State of California to cause cancer, birth, or any other reproductive defects.
OSHA Hazards:	No known OSHA hazards.
DSL Status:	All components of this product are on the Canadian DSL list.
Other Classifications:	
DSCL (EEC):	S24/25 Avoid contact with skin and eyes.

Section 16 – Other Information

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Section 1 – Product and Company Information

Reagent/Buffer Name: PrepAmp Polymerase
Catalog Number: D5455-4-6, D5455-4-15

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	$C_3H_8O_3$	≤50%

Section 3 – Hazard Identification

Target Organs: Kidneys

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

HMIS Ratings (scale 0 – 4) :
Health = 2
Fire = 0
Reactivity = 1

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.

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 irritation develops.
Ingestion:	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.
Inhalation:	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

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

Section 6 – Accidental Release Measures

General Information:	Wear self-contained breathing apparatus, safety goggles, rubber boots, full suit, and protective gloves.
Spills / Leaks:	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

Handling:	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.
Storage:	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.

Exposure Limits:	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.

Section 9 – Physical and Chemical Properties

Physical States / Form:	Liquid
Appearance:	Colorless

Melting Point: 19°C

Boiling Point: 180°C

Autoignition Temperature: 369°C

Flash Point: 160°C

Vapor Pressure: < 1 mmHg 20°C

Specific Gravity: 1.261

Vapor Density: 3.1

Solubility: Miscible in water and alcohol.

Section 10 – Stability and Reactivity

Stability: Stable.

Substances To Be Avoided: Strong oxidizing agents, strong bases.

Conditions To Be Avoided: Avoid contact with incompatible materials, excess heat and ignition, sources, moisture.

Hazardous Polymerization: Will not occur.

Section 11 – Toxicological Information

Acute Effects

Inhalation: Inhalation of mist may cause respiratory tract irritation.

Eye Contact: May cause eye irritation.

Skin Contact: May cause skin irritation.

Ingestion: Low hazard. Low toxicity except with very large doses.

Route Of Entry:: Eye contact. Skin absorption.

RTECS Number: MA8050000

Toxicity Data:

Route	Organism	Dose	Reference
Oral	Rat	LD50: 12600 mg/kg	FEPRA7 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	JIHTAB 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.

Additional Information: The product should be handled with the normal caution accorded to chemical handling. Additional harmful properties cannot be ruled out.

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: PrepAmp Buffer
Catalog Number: D5455-2-30, D5455-2-75

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
Tris(hydroxymethyl)aminomethane hydrochloride	1185-53-1	C4H11NO3ClH	≤5%

Section 3 – Hazard Identification

Hazard Description: Not applicable. This product has been classified as nonhazardous.
Target Organs: Not applicable

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

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

OSHA Hazard Overview (Criteria according to 29CFR1910.1200) : Not applicable

Section 4 – First Aid Measures

General Information: No special measures required.

Eye Contact: Rinse eyes with plenty of water for several minutes.

Skin Contact:	Generally, product does not irritate the skin.
Inhalation:	Provide fresh air. If symptoms persist, consult a doctor.
Ingestion:	If symptoms persist, consult a doctor.

Section 5 – Fire Fighting Measures

Fire Fighting Media and Instructions:	Use CO_2, extinguishing powder or water spray Larger Fire: Use water spray or alcohol resistant foam.

Section 6 – Accidental Release Measures

Procedure(s) Of Personal Precaution(s) :	No special precautions required.
Environmental Protection:	No special measures required.
Methods For Cleaning Up:	Absorb with sand or liquid-binding material.

Section 7 – Handling and Storage

Handling:	No special measures required.
Storage:	No special measures required.

Section 8 – Exposure Controls / Personal Protection

General Protective Measures:	Ensure usual precautionary measures when handling chemicals.
Personal Protection Equipment:	Lab coat. Protective gloves. Splash goggles.
Components With Limit Values That Require Monitoring At The Workplace:	Not applicable

Section 9 – Physical and Chemical Properties

Physical State And Appearance:	Fluid
Odor:	Characteristic
Color:	Colorless
Boiling Point:	Not available
Melting Point:	$0^{o}C$ ($32^{o}F$)
Flash Point:	Not applicable
Auto Igniting:	Product is not selfigniting
Danger of Explosion:	Product does not present an explosion hazard
Density:	1 g/cm^{3} at $20^{o}C$ ($68^{o}F$)
Solubility In Water:	Not miscible or difficult to mix.
Solvent Content:	Organic Solvent: 0.0%; Water: 98.5%

Section 10 – Stability and Reactivity

Thermal Decomposition/ Conditions To Avoid:	No decomposition if used according to specifications.
Hazardous/Dangerous Decomposition Products:	No dangerous decomposition products known.

Section 11 – Toxicological Information

Acute Toxicity	
Primary Irritant Effect On The Skin:	No irritant effect to skin and mucous membranes.
Primary Irritant Effect On The Eye:	Irritant effect to eyes
Sensitization:	No sensitization effects known.

Section 12 – Ecological Information

No data available.

Section 13 – Disposal Considerations

Dispose according to official regulations. Do not dispose with household garbage. Do not allow product to reach sewage system.

Section 14 – Transport Considerations

DOT Regulations:	Not regulated
Maritime transport IMDG	
Marine Pollutant	No

Section 15 – Regulatory Information

SARA:	
Section 355 (Extremely Hazardous Substances)	Ingredients not listed
Section 313 (Specific Toxic Chemical Listing	Ingredients not listed
TSCA (Toxic Substances Control Act	Ingredients listed
Proposition 65:	
Chemicals Known To Cause Cancer	Ingredients not listed
Chemicals Known To Cause Reproductive Toxicity For Females	Ingredients not listed
Chemicals Known To Cause Reproductive Toxicity For Males	Ingredients not listed
Chemicals Known To Cause Developmental Toxicity	Ingredients not listed

Cancerogenity Categories:

EPA (Environmental Protection Agency)	Ingredients not listed
IARC (International Agency for Research on Cancer)	Ingredients not listed
NTP (National Toxicology Program)	Ingredients not listed
TLV (Threshold Limit Value established by ACGIH)	Ingredients not listed
MAK (German Maximum Workplace Concentration)	Ingredients not listed
NIOSH-Ca (National Institute for Occupational Safety and Health)	Ingredients not listed
OSHA-Ca (Occupational Safety and Health Administration)	Ingredients not listed

Related Hazardous Information: Ensure general safety regulations when handling chemicals.

Section 16 – Other Information

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Section 1 – Product and Company Information

Reagent/Buffer Name: PrepAmp Primer
Catalog Number: D5455-1-15, D5455-1-30

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 #	EINEC No.	Formula	Percent
Tris(hydroxymethyl)aminomethane / Hydrochloric Acid	1185-53-1	214-684-5	C4H11NO3.HCL	≤ 1%
Ethylenediaminetetraacetic Acid, pH 8.0	6381-92-6	205-358-3	C10H14N2Na2O8•2H2O	≤ 1%

According to the OSHR 29 CFR§1910_1200, a mixture that contains less than one percent by weight or volume of a non-carcinogenic hazardous component is not considered hazardous, unless there is evidence to the contrary. We do not consider this product to be hazardous; however we recommend the use of gloves, lab coats and eye protection when working with these or any chemical reagents.

Section 3 – Hazard Identification

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

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

OSHA Hazard: No known OSHA hazards

Potential Acute Health Effects:
Eyes: May cause eye irritation.
Inhalation: May be harmful if inhaled. May cause respiratory tract irritation.
Ingestion: May be harmful if swallowed.
Skin: May be harmful if absorbed through skin. May cause skin irritation.

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 large volumes of soap and water.
Ingestion:	Wash out mouth with water provided person is conscious.
Inhalation:	Remove victim to fresh air. Give oxygen if breathing becomes difficult. Should breathing stop, give artificial respiration.

Section 5 – Fire Fighting Measures

Extinguishing Media:	Noncombustible. Use extinguishing media appropriate to surrounding fire conditions.
Special Fire Fighting Procedures:	Wear self-contained breathing apparatus and protective garments to prevent contact with skin and eyes.

Section 6 – Accidental Release Measures

General Information:	Wear self-contained breathing apparatus, chemical safety goggles, rubber boots, and heavy rubber gloves. Avoid breathing vapors, mist or gas.
Spills / Leaks:	Keep in suitable, closed containers for disposal.

Section 7 – Handling and Storage

Storage:	Store tightly closed in a dry and well-ventilated place.

Section 8 – Exposure Controls / Personal Protection

Whenever workplace conditions warrant a respirator use, wear tested and approved NIOSH (US) or CEN (EU) respirators and components. Wear protective gloves and safety goggles. Provide safety shower and eyewash station. Keep tightly closed. Wash thoroughly after handling.

Section 9 – Physical and Chemical Properties

Physical States / Form:	Liquid	
Color:	Colorless	
pH-Factor:	(20°C)	8.0
Specific Gravity:	(20°C)	0.990 g/cm^2
Solubility In Water:	(20°C)	Soluble

Section 10 – Stability and Reactivity

Substances To Be Avoided:	Strong oxidizing agents.
Hazardous, Combustion, Or Decomposition Products:	Hazardous decomposition products formed under fire conditions. Nature of decomposition products not known.

Section 11 – Toxicological Information

Acute Effects

Inhalation:	May be harmful by inhalation. May cause respiratory tract irritation.
Eye Contact:	May cause eye irritation.
Skin Contact:	May cause skin irritation. May cause skin irritation.
Ingestion:	May be harmful if swallowed.
Signs and Symptoms of Exposure:	Caution! The toxicological properties of this mixture have not been fully investigated. Follow good laboratory practices when handling.
RTECS Number:	Mixture not listed.
Additional Information:	The product should be handled with the normal caution accorded to chemical handling. Additional harmful properties cannot be ruled out.

Section 12 – Ecological Information

No information available.

Section 13 – Disposal Considerations

Observe all federal, state, and local environmental regulations.

Section 14 – Transport Considerations

DOT Regulations:	Not dangerous goods. Not regulated.
IMDG:	Not dangerous goods. Not regulated.
IATA:	Not dangerous goods. Not regulated.

Section 15 – Regulatory Information

SARA:

Section 302	No products were found.
Section 313	No products were found.
SARA 311/312 Hazards	No SARA Hazards.
California Prop. 65 Components:	This product does not contain any chemicals known to State of California to cause cancer, birth, or any other reproductive defects.
OSHA Hazards:	No known OSHA hazards.
DSL Status:	All components of this product are on the Canadian DSL list.

Section 16 – Other Information

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Section 1 – Product and Company Information

Reagent/Buffer Name: PrepAmp Pre-Mix
Catalog Number: D5455-3-50, D5455-3-120

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	$C_3H_8O_3$	≤5%

Section 3 – Hazard Identification

Target Organs: Kidneys

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

HMIS Ratings (scale 0 – 4) :
Health = 2
Fire = 0
Reactivity = 1

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.

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 irritation develops.
Ingestion:	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.
Inhalation:	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

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

Section 6 – Accidental Release Measures

General Information:	Wear self-contained breathing apparatus, safety goggles, rubber boots, full suit, and protective gloves.
Spills / Leaks:	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

Handling:	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.
Storage:	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.

Exposure Limits:	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.

Section 9 – Physical and Chemical Properties

Physical States / Form:	Liquid
Appearance:	Colorless

Melting Point: 19°C

Boiling Point: 290°C

Autoignition Temperature: 369°C

Flash Point: 160°C

Vapor Pressure: 0 kPa 20°C

Specific Gravity: 1.261

Vapor Density: 3.1

Solubility: Miscible in water and alcohol.

Section 10 – Stability and Reactivity

Stability: Stable.

Substances To Be Avoided: Strong oxidizing agents, strong bases.

Conditions To Be Avoided: Avoid contact with incompatible materials, excess heat and ignition, sources, moisture.

Corrosivity: Non-corrosive in presence of glass.

Hazardous Polymerization: Will not occur.

Section 11 – Toxicological Information

Acute Effects

Inhalation: Inhalation of mist may cause respiratory tract irritation.

Eye Contact: Causes eye irritation.

Skin Contact: Causes skin irritation. May be absorbed through the skin.

Ingestion: 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.

Route Of Entry:: Eye contact. Skin absorption.

RTECS Number: MA8050000

Toxicity Data:

Route	Organism	Dose	Reference
Oral	Rat	LD50: 12600 mg/kg	FEPRA7 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	JIHTAB 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.

Additional Information: The product should be handled with the normal caution accorded to chemical handling. Additional harmful properties cannot be ruled out.

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: DNase/RNase Free Water
Catalog Number: W1001-1, W1001-4, W1001-6, W1001-10

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	Concentration
N/A	N/A	N/A	N/A

According to the OSHR 29 CFR§1910_1200, a mixture that contains less than one percent by weight or volume of a non-carcinogenic hazardous component is not considered hazardous, unless there is evidence to the contrary. We do not consider this product to be hazardous; however we recommend the use of gloves, lab coats and eye protection when working with these or any chemical reagents.

Section 3 – Hazard Identification

Not applicable.

Section 4 – First Aid Measures

In Case of

Eye Contact: Not applicable.

Skin Contact: Not applicable.

Ingestion: Not applicable.

Inhalation: Not applicable.

Section 5 – Fire Fighting Measures

Extinguishing Media: Use extinguishing media appropriate for surrounding fire.

Special Fire Fighting Procedures: No special measures required.

Section 6 – Accidental Release Measures

Non-hazardous material. Clean up of spills requires no special equipment or procedures.

Section 7 – Handling and Storage

Handling: No special requirements.

Storage: No special requirements.

Section 8 – Exposure Controls / Personal Protection

No special precautions required.

Section 9 – Physical and Chemical Properties

Physical States / Form: Liquid

Color: Colorless

Boiling Point: 100^{o}C (212^{o}F)

Melting Point: 0^{o}C (32^{o}F)

Solubility In Water: Soluble

Section 10 – Stability and Reactivity

Stability: Stable

Substances To Be Avoided: None

Hazardous, Combustion, Or Decomposition Products: None

Section 11 – Toxicological Information

Acute Effects
Inhalation: N/A

Eye Contact: N/A

Skin Contact: N/A

Ingestion: N/A

Prolonged Exposure: N/A

Chronic Effects: N/A

Section 12 – Ecological Information

No information available.

Section 13 – Disposal Considerations

If material becomes contaminated during use, dispose of accordingly. Dispose of container and unused contents in accordance with federal, state and local requirements.

Section 14 – Transport Considerations

No information available.

Section 15 – Regulatory Information

No information available.

Section 16 – Other Information

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Section 1 – Product and Company Information

Reagent/Buffer Name: DNA Binding Buffer
Catalog Number: D4003-1-25, D4003-1-L, D4004-1-L

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	Concentration
Guanidine Hydrochloride	50-01-1	200-002-3	CH_6N_3Cl	≥ 3M

Section 3 – Hazard Identification

Emergency Overview: OSHA Hazards: Target Organ Effect, Toxic by ingestion, Irritant

Target Organs: Bone marrow, Nerves.

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

HMIS Ratings (scale 0 – 4) :
Health = 2
Fire = 0
Physical Hazard = 0

Potential Health Effects: Harmful if inhaled or absorbed through skin. Toxic if swallowed. Causes eye irritation.

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 for at least 15 minutes as contaminated clothing is removed. Get medical attention if area remains irritated. Do not wear contaminated clothing until after it has been properly cleaned.
Ingestion:	Never give anything by mouth to an unconscious person. Rinse mouth with water. Get immediate medical attention.
Inhalation:	Remove victim to fresh air. Give oxygen if breathing becomes difficult. Should breathing stop, give artificial respiration.

Section 5 – Fire Fighting Measures

Extinguishing Media:	Water spray. Carbon dioxide, dry chemical powder, or alcohol-resistant foam.
Special Fire Fighting Procedures:	Wear self-contained breathing apparatus and protective garments.

Section 6 – Accidental Release Measures

General Information:	Wear self-contained breathing apparatus, chemical safety goggles, rubber boots, and heavy rubber gloves.
Spills / Leaks:	Avoid dust formation. Avoid breathing dust. Do not let product enter drains. Ventilate area and wash spill site after material pickup is complete.

Section 7 – Handling and Storage

Handling:	Avoid formation of dust and aerosols. Avoid contact with skin and eyes. Provide appropriate exhaust ventilation.
Storage:	Store tightly closed in a dry and well-ventilated place.

Section 8 – Exposure Controls / Personal Protection

Wear appropriate NIOSH (US) or CEN (EU)-Approved respirator, protective gloves, safety goggles. Safety shower and eye both. Mechanical exhaust required. Keep tightly closed. Wash thoroughly after handling. Do not get in contact with eyes, skin or on clothing. Do not inhale vapor. Severe eye irritant.

Section 9 – Physical and Chemical Properties

Physical States / Form:	Liquid
Color:	Colorless
pH-Factor:	4.5 - 6 at 573 g/l at 25 °C (77 °F)
Flashpoint:	N/A
Melting Point:	180 - 185 °C (356 - 365 °F)
Solubility In Water:	573 g/l at 20 °C (68 °F)

Section 10 – Stability and Reactivity

Substances To Be Avoided:	Strong oxidizing agents.
Hazardous, Combustion, Or Decomposition Products:	Carbon oxides, nitrogen oxides, and hydrogen chloride gas.

Section 11 – Toxicological Information

Acute Effects

Inhalation:	May be harmful by inhalation. Causes respiratory tract irritation.
Eye Contact:	Causes severe eye irritation.
Skin Contact:	Causes skin irritation, harmful by skin absorption.
Ingestion:	Toxic if swallowed.
Target Organ Data:	Bone marrow, nerves.
Chronic Effects:	IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC. ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH. NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP. OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
RTECS Number:	MF4300000
Toxicity Data:	Oral Rat LD50: 475 mg/kg Only selected registry of toxic effects of chemical substances (RTECS) data is presented here. See actual entry in RTECS for complete information.
Additional Information:	The product should be handled with the normal caution accorded to chemical handling. Additional harmful properties cannot be ruled out.

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. Do not dispose with household garbage. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Section 14 – Transport Considerations

DOT (US)	Not dangerous goods
IMDG	Not dangerous goods
IATA	Not dangerous goods

Section 15 – Regulatory Information

OSHA Hazards:	Irritant, Target Organ Effect, Toxic by ingestion
DSL Status:	All components of this product are on the Canadian DSL list.
SARA 302 Components **SARA 302:**	No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components		
SARA 313:	This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.	
SARA 311/312 Hazards:	Acute Health Hazard, Chronic Health Hazard	
Massachusetts Right To Know Components:	No components are subject to the Massachusetts Right to Know Act.	
Pennsylvania Right To Know Components:	Guanidinium chloride	CAS-No. 50-01-1
New Jersey Right To Know Components:	Guanidinium chloride	CAS-No. 50-01-1
California Prop. 65 Components:	This product does not contain any chemicals known to State of California to cause cancer, birth, or any other reproductive defects.	

Section 16 – Other Information

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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: DNA Wash Buffer
Catalog Number: D4003-2-6, D4003-2-24, D4003-2-48, D4004-W-L

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 #	EINEC No.	Formula	Percent
Tris(hydroxymethyl)aminomethane / Hydrochloric Acid	1185-53-1	214-684-5	C4H11NO3.HCL	≤ 1%
Ethylenediaminetetraacetic Acid, pH 8.0	6381-92-6	205-358-3	C10H14N2Na2O8•2H2O	≤ 1%

According to OSHA 29CFR1910.1200, a mixture that contains less than 1% of a component classified as hazardous or less than 0.1% of a component classified as carcinogenic is not considered hazardous unless there is evidence to the contrary. However, we recommend the use of gloves, lab coats and eye protection when working with these or any chemical reagents.

Section 3 – Hazard Identification

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

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

OSHA Hazard: No known OSHA hazards

Potential Acute Health Effects:
Eyes: May cause eye irritation.
Inhalation: May be harmful if inhaled. May cause respiratory tract irritation.
Ingestion: May be harmful if swallowed.
Skin: May be harmful if absorbed through skin. May cause skin irritation.

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 large volumes of soap and water.
Ingestion:	Wash out mouth with water provided person is conscious.
Inhalation:	Remove victim to fresh air. Give oxygen if breathing becomes difficult. Should breathing stop, give artificial respiration.

Section 5 – Fire Fighting Measures

Extinguishing Media:	Noncombustible. Use extinguishing media appropriate to surrounding fire conditions.
Special Fire Fighting Procedures:	Wear self-contained breathing apparatus and protective garments to prevent contact with skin and eyes.

Section 6 – Accidental Release Measures

General Information:	Wear self-contained breathing apparatus, chemical safety goggles, rubber boots, and heavy rubber gloves. Avoid breathing vapors, mist or gas.
Spills / Leaks:	Keep in suitable, closed containers for disposal.

Section 7 – Handling and Storage

Storage:	Store tightly closed in a dry and well-ventilated place.

Section 8 – Exposure Controls / Personal Protection

Whenever workplace conditions warrant a respirator use, wear tested and approved NIOSH (US) or CEN (EU) respirators and components. Wear protective gloves and safety goggles. Provide safety shower and eyewash station. Keep tightly closed. Wash thoroughly after handling.

Section 9 – Physical and Chemical Properties

Physical States / Form:	Liquid	
Color:	Colorless	
pH-Factor:	(20°C)	8.0
Specific Gravity:	(20°C)	0.990 g/cm^2
Solubility In Water:	(20°C)	Soluble

Section 10 – Stability and Reactivity

Substances To Be Avoided:	Strong oxidizing agents.
Hazardous, Combustion, Or Decomposition Products:	Hazardous decomposition products formed under fire conditions. Nature of decomposition products not known.

Section 11 – Toxicological Information

Acute Effects

Inhalation:	May be harmful by inhalation. May cause respiratory tract irritation.
Eye Contact:	May cause eye irritation.
Skin Contact:	May cause skin irritation. May cause skin irritation.
Ingestion:	May be harmful if swallowed.
Signs and Symptoms of Exposure:	Caution! The toxicological properties of this mixture have not been fully investigated. Follow good laboratory practices when handling.
RTECS Number:	Mixture not listed.
Additional Information:	The product should be handled with the normal caution accorded to chemical handling. Additional harmful properties cannot be ruled out.

Section 12 – Ecological Information

No information available.

Section 13 – Disposal Considerations

Observe all federal, state, and local environmental regulations.

Section 14 – Transport Considerations

DOT Regulations:	Not dangerous goods. Not regulated.
IMDG:	Not dangerous goods. Not regulated.
IATA:	Not dangerous goods. Not regulated.

Section 15 – Regulatory Information

SARA:

Section 302	No products were found.
Section 313	No products were found.
SARA 311/312 Hazards	No SARA Hazards.
California Prop. 65 Components:	This product does not contain any chemicals known to State of California to cause cancer, birth, or any other reproductive defects.
OSHA Hazards:	No known OSHA hazards.
DSL Status:	All components of this product are on the Canadian DSL list.

Section 16 – Other Information

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Section 1 – Product and Company Information

Reagent/Buffer Name: LibraryAmp Master Mix (2X)
Catalog Number: D5455-5-250, D5455-5-625

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	$C_3H_8O_3$	≤50%

Section 3 – Hazard Identification

Target Organs: Kidneys

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

HMIS Ratings (scale 0 – 4) :
Health = 2
Fire = 0
Reactivity = 1

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.

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 irritation develops.
Ingestion:	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.
Inhalation:	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

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

Section 6 – Accidental Release Measures

General Information:	Wear self-contained breathing apparatus, safety goggles, rubber boots, full suit, and protective gloves.
Spills / Leaks:	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

Handling:	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.
Storage:	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.

Exposure Limits:	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.

Section 9 – Physical and Chemical Properties

Physical States / Form:	Liquid
Appearance:	Colorless

Melting Point: 19°C

Boiling Point: 180°C

Autoignition Temperature: 369°C

Flash Point: 160°C

Vapor Pressure: < 1 mmHg 20°C

Specific Gravity: 1.261

Vapor Density: 3.1

Solubility: Miscible in water and alcohol.

Section 10 – Stability and Reactivity

Stability: Stable.

Substances To Be Avoided: Strong oxidizing agents, strong bases.

Conditions To Be Avoided: Avoid contact with incompatible materials, excess heat and ignition, sources, moisture.

Hazardous Polymerization: Will not occur.

Section 11 – Toxicological Information

Acute Effects

Inhalation: Inhalation of mist may cause respiratory tract irritation.

Eye Contact: May cause eye irritation.

Skin Contact: May cause skin irritation.

Ingestion: Low hazard. Low toxicity except with very large doses.

Route Of Entry:: Eye contact. Skin absorption.

RTECS Number: MA8050000

Toxicity Data:

Route	Organism	Dose	Reference
Oral	Rat	LD50: 12600 mg/kg	FEPRA7 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	JIHTAB 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.

Additional Information: The product should be handled with the normal caution accorded to chemical handling. Additional harmful properties cannot be ruled out.

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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Section 1 – Product and Company Information

Reagent/Buffer Name: LibraryAmp Primers
Catalog Number: D5455-6-15, D5455-6-30

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 #	EINEC No.	Formula	Percent
Tris(hydroxymethyl)aminomethane / Hydrochloric Acid	1185-53-1	214-684-5	C4H11NO3.HCL	≤ 1%
Ethylenediaminetetraacetic Acid, pH 8.0	6381-92-6	205-358-3	C10H14N2Na2O8•2H2O	≤ 1%

According to the OSHR 29 CFR§1910_1200, a mixture that contains less than one percent by weight or volume of a non-carcinogenic hazardous component is not considered hazardous, unless there is evidence to the contrary. We do not consider this product to be hazardous; however we recommend the use of gloves, lab coats and eye protection when working with these or any chemical reagents.

Section 3 – Hazard Identification

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

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

OSHA Hazard: No known OSHA hazards

Potential Acute Health Effects:
Eyes: May cause eye irritation.
Inhalation: May be harmful if inhaled. May cause respiratory tract irritation.
Ingestion: May be harmful if swallowed.
Skin: May be harmful if absorbed through skin. May cause skin irritation.

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 large volumes of soap and water.
Ingestion:	Wash out mouth with water provided person is conscious.
Inhalation:	Remove victim to fresh air. Give oxygen if breathing becomes difficult. Should breathing stop, give artificial respiration.

Section 5 – Fire Fighting Measures

Extinguishing Media:	Noncombustible. Use extinguishing media appropriate to surrounding fire conditions.
Special Fire Fighting Procedures:	Wear self-contained breathing apparatus and protective garments to prevent contact with skin and eyes.

Section 6 – Accidental Release Measures

General Information:	Wear self-contained breathing apparatus, chemical safety goggles, rubber boots, and heavy rubber gloves. Avoid breathing vapors, mist or gas.
Spills / Leaks:	Keep in suitable, closed containers for disposal.

Section 7 – Handling and Storage

Storage:	Store tightly closed in a dry and well-ventilated place.

Section 8 – Exposure Controls / Personal Protection

Whenever workplace conditions warrant a respirator use, wear tested and approved NIOSH (US) or CEN (EU) respirators and components. Wear protective gloves and safety goggles. Provide safety shower and eyewash station. Keep tightly closed. Wash thoroughly after handling.

Section 9 – Physical and Chemical Properties

Physical States / Form:	Liquid	
Color:	Colorless	
pH-Factor:	(20°C)	8.0
Specific Gravity:	(20°C)	0.990 g/cm^2
Solubility In Water:	(20°C)	Soluble

Section 10 – Stability and Reactivity

Substances To Be Avoided:	Strong oxidizing agents.
Hazardous, Combustion, Or Decomposition Products:	Hazardous decomposition products formed under fire conditions. Nature of decomposition products not known.

Section 11 – Toxicological Information

Acute Effects

Inhalation:	May be harmful by inhalation. May cause respiratory tract irritation.
Eye Contact:	May cause eye irritation.
Skin Contact:	May cause skin irritation. May cause skin irritation.
Ingestion:	May be harmful if swallowed.
Signs and Symptoms of Exposure:	Caution! The toxicological properties of this mixture have not been fully investigated. Follow good laboratory practices when handling.
RTECS Number:	Mixture not listed.
Additional Information:	The product should be handled with the normal caution accorded to chemical handling. Additional harmful properties cannot be ruled out.

Section 12 – Ecological Information

No information available.

Section 13 – Disposal Considerations

Observe all federal, state, and local environmental regulations.

Section 14 – Transport Considerations

DOT Regulations:	Not dangerous goods. Not regulated.
IMDG:	Not dangerous goods. Not regulated.
IATA:	Not dangerous goods. Not regulated.

Section 15 – Regulatory Information

SARA:

Section 302	No products were found.
Section 313	No products were found.
SARA 311/312 Hazards	No SARA Hazards.
California Prop. 65 Components:	This product does not contain any chemicals known to State of California to cause cancer, birth, or any other reproductive defects.
OSHA Hazards:	No known OSHA hazards.
DSL Status:	All components of this product are on the Canadian DSL list.

Section 16 – Other Information

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Section 1 – Product and Company Information

Reagent/Buffer Name: Index Primer Sets
Catalog Number: D5450-4

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 #	EINEC No.	Formula	Percent
Tris(hydroxymethyl)aminomethane / Hydrochloric Acid	1185-53-1	214-684-5	C4H11NO3.HCL	≤ 1%
Ethylenediaminetetraacetic Acid, pH 8.0	6381-92-6	205-358-3	C10H14N2Na2O8•2H2O	≤ 1%

According to the OSHR 29 CFR§1910_1200, a mixture that contains less than one percent by weight or volume of a non-carcinogenic hazardous component is not considered hazardous, unless there is evidence to the contrary. We do not consider this product to be hazardous; however we recommend the use of gloves, lab coats and eye protection when working with these or any chemical reagents.

Section 3 – Hazard Identification

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

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

OSHA Hazard: No known OSHA hazards

Potential Acute Health Effects:
Eyes: May cause eye irritation.
Inhalation: May be harmful if inhaled. May cause respiratory tract irritation.
Ingestion: May be harmful if swallowed.
Skin: May be harmful if absorbed through skin. May cause skin irritation.

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 large volumes of soap and water.
Ingestion:	Wash out mouth with water provided person is conscious.
Inhalation:	Remove victim to fresh air. Give oxygen if breathing becomes difficult. Should breathing stop, give artificial respiration.

Section 5 – Fire Fighting Measures

Extinguishing Media:	Noncombustible. Use extinguishing media appropriate to surrounding fire conditions.
Special Fire Fighting Procedures:	Wear self-contained breathing apparatus and protective garments to prevent contact with skin and eyes.

Section 6 – Accidental Release Measures

General Information:	Wear self-contained breathing apparatus, chemical safety goggles, rubber boots, and heavy rubber gloves. Avoid breathing vapors, mist or gas.
Spills / Leaks:	Keep in suitable, closed containers for disposal.

Section 7 – Handling and Storage

Storage:	Store tightly closed in a dry and well-ventilated place.

Section 8 – Exposure Controls / Personal Protection

Whenever workplace conditions warrant a respirator use, wear tested and approved NIOSH (US) or CEN (EU) respirators and components. Wear protective gloves and safety goggles. Provide safety shower and eyewash station. Keep tightly closed. Wash thoroughly after handling.

Section 9 – Physical and Chemical Properties

Physical States / Form:	Liquid	
Color:	Colorless	
pH-Factor:	(20°C)	8.0
Specific Gravity:	(20°C)	0.990 g/cm^2
Solubility In Water:	(20°C)	Soluble

Section 10 – Stability and Reactivity

Substances To Be Avoided:	Strong oxidizing agents.
Hazardous, Combustion, Or Decomposition Products:	Hazardous decomposition products formed under fire conditions. Nature of decomposition products not known.

Section 11 – Toxicological Information

Acute Effects

Inhalation:	May be harmful by inhalation. May cause respiratory tract irritation.
Eye Contact:	May cause eye irritation.
Skin Contact:	May cause skin irritation. May cause skin irritation.
Ingestion:	May be harmful if swallowed.
Signs and Symptoms of Exposure:	Caution! The toxicological properties of this mixture have not been fully investigated. Follow good laboratory practices when handling.
RTECS Number:	Mixture not listed.
Additional Information:	The product should be handled with the normal caution accorded to chemical handling. Additional harmful properties cannot be ruled out.

Section 12 – Ecological Information

No information available.

Section 13 – Disposal Considerations

Observe all federal, state, and local environmental regulations.

Section 14 – Transport Considerations

DOT Regulations:	Not dangerous goods. Not regulated.
IMDG:	Not dangerous goods. Not regulated.
IATA:	Not dangerous goods. Not regulated.

Section 15 – Regulatory Information

SARA:

Section 302	No products were found.
Section 313	No products were found.
SARA 311/312 Hazards	No SARA Hazards.
California Prop. 65 Components:	This product does not contain any chemicals known to State of California to cause cancer, birth, or any other reproductive defects.
OSHA Hazards:	No known OSHA hazards.
DSL Status:	All components of this product are on the Canadian DSL list.

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