ZYMO RESEARCH

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Material Safety Data Sheet

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Section 1 – Product and Company Information

Reagent/Buffer Name: Proteinase K Storage Buffer
Catalog Number: D3001-2-5, D3001-2-20

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 = 1
Fire = 1
Reactivity = 0

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

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

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

Section 4 – First Aid Measures

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

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): R36/38 Irritating to eyes and skin.
S24/25 Avoid contact with skin and eyes.

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

Section 16 – Other Information

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Section 1 – Product and Company Information

Reagent/Buffer Name: M-Digestion Buffer (2X)
Catalog Number: D5020-9, D5021-9

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.	

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Section 1 – Product and Company Information

Reagent/Buffer Name: CT Conversion Reagent
Catalog Number: D5001-1, D5003-1

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 #	EINEC No.	Formula	Percent
Sodium Metabisulfite	7681-57-4	231-673-0	$Na_2S_2O_5$	≥ 97%

Section 3 – Hazard Identification

May cause severe eye irritation and possible injury. May cause allergic respiratory and skin reaction. May be harmful if swallowed. May cause skin and respiratory tract irritation. Contact with acids liberates toxic gas, sulfur dioxide. Slowly oxidized to the sulfate on exposure to air and moisture. Corrosive to aluminum in aqueous solution.

Target Organs: Respiratory system, eyes, skin.

NFPA Rating: (estimated)
Health: 3
Flammability: 0
Instability: 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 aid immediately. Get medical aid if irritation develops and persists.

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.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. 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 aid.

Section 5 – Fire Fighting Measures

Extinguishing Media: Noncombustible. Use water fog, dry chemical, carbon dioxide, or regular foam.

Special Fire Fighting Procedures: Wear self-contained breathing apparatus and protective garments to prevent contact with skin and eyes. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Section 6 – Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills / Leaks: Sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation and wash spill site after material pickup is complete.

Section 7 – Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Keep container tightly closed. Avoid breathing dust. Do not get in eyes. Avoid contact with skin and clothing.

Storage: Store tightly closed in a cool, dry, well-ventilated area away from incompatible substances. Keep away from strong acids. Do not store in aluminum containers. Store protected from moisture. Keep away from oxidizing agents.

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. Avoid prolonged or repeated exposure. Wash thoroughly after handling. Do not get in contact with eyes, skin or on clothing. Do not breathe dust.

OSHA Vacated PELs: Sodium metabisulfite: 5 mg/m3 TWA Sulfur dioxide: 2 ppm TWA; 5 mg/m3 TWA

Personal Protective Equipment: Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Exposure Limits:

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium metabisulfite	5 mg/m3 TWA	5 mg/m3 TWA	none listed
Sulfur dioxide	2 ppm TWA; 5 ppm STEL	2 ppm TWA; 5 mg/m3 TWA 100 ppm IDLH	5 ppm TWA; 13 mg/m3 TWA

Section 9 – Physical and Chemical Properties

Physical States / Form: Solid

Color: White

pH-Factor: Acid in soln.

Viscosity: N/A

Freezing/Melting Point: 150 °C

Boiling Point: N/A
Flashpoint: N/A

Decomposition Temperature: 150 °C

Specific Gravity/Density: 1.4

Solubility: Soluble

Section 10 – Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Slowly oxidized to the sulfate on exposure to air and moisture.

Conditions To Avoid: Dust generation, exposure to air, excess heat, Corrosive to aluminum in aqueous solution. Moisture sensitive.

Substances To Be Avoided: Strong acids, strong bases, strong oxidizing agents, air, and light.

Hazardous, Combustion, Or Decomposition Products: Carbon monoxide, carbon dioxide, toxic fumes of sulfur oxides.

Hazardous Polymerization: Has not been reported.

Section 11 – Toxicological Information

Toxicity Data:

CAS# 7681-57-4:

Route	Organism	Dose
Dermal	Guinea Pig	LD50: >1 gm/kg
Draize Test Eye	Rabbit	100 mg/24H Mild
Draize Test Skin	Rabbit	500 mg
Oral	Rat	LD50: 1131 mg/kg
Skin	Rat	LD50: >2 gm/kg

CAS# 7446-09-5:

Route	Organism	Dose
Inhalation	Mouse	LC50: 3000 ppm/30M
Draize Test Eye	Rabbit	6 ppm/32D Mild
Inhalation	Rat	LC50: 2520 ppm/1H
Inhalation	Rat	LC50: 2168 mg/m3

Potential Health Effects:

Inhalation: May be harmful by inhalation. May cause allergic respiratory reaction. Inhalation of dust may cause respiratory tract irritation.

Eye Contact: Causes severe eye irritation.

Skin Contact: Causes skin irritation, harmful if absorbed through skin. May cause an allergic reaction in certain individuals.

Ingestion: Harmful if swallowed. May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Sulfite compounds may cause a severe allergic reaction in sensitive individuals and some asthmatics.

Other: May cause allergic reactions. Certain individuals with preexisting respiratory conditions such as asthma may experience hypersensitivity to sulfites and sulfur dioxide. The symptoms include bronchoconstriction, bronchospasm, gastrointestinal disturbances, flushing, hypotension, tingling sensation, urticaria / angioedema and shock. May cause cyanosis.

Chronic Effects: Prolonged or repeated skin contact may cause dermatitis. Repeated or prolonged exposure may cause allergic reactions in sensitive individuals.

RTECS Number: CAS# 7681-57-4: UX8225000
CAS# 7446-09-5: WS4550000

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

There are no uniform regulations for the disposal of chemicals or residues. Chemical residues generally count as special waste. We recommend that you contact either the authorities in charge or approved waste disposal companies that will advise you on how to dispose of special waste. Handle contaminated packaging in the same way as the substance itself. Unless specified differently, noncontaminated packaging may be treated like household waste or recycled. Observe all federal, state and local environmental regulations.

Section 14 – Transport Considerations

US DOT:
Shipping Name: Not regulated
Hazard Class:
UN Number:
Packing Group:

Canada TDG:
Shipping Name: Not regulated
Hazard Class:
UN Number:
Packing Group:

Section 15 – Regulatory Information

US Federal
TSCA: CAS# 7681-57-4 is listed on the TSCA inventory.
CAS# 7446-09-5 is listed on the TSCA inventory.

Health & Safety Reporting List: None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules: None of the chemicals in this product are under a Chemical Test Rule.

Section 12b: None of the chemicals are listed under TSCA Section 12b.

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

CERCLA Hazardous Substances And Corresponding RQs: None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances: CAS# 7446-09-5: 500 lb TPQ

SARA Codes: CAS # 7681-57-4: immediate.
CAS # 7446-09-5: immediate, sudden release of pressure.

Section 313: No chemicals are reportable under Section 313.

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

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

OSHA: CAS# 7446-09-5 is considered highly hazardous by OSHA.

STATE: CAS# 7681-57-4 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

	CAS# 7446-09-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.
California Prop 65:	California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

Hazard Symbols:	Xn
Risk Phrases:	R 22 Harmful if swallowed. R 31 Contact with acids liberates toxic gas. R 41 Risk of serious damage to eyes.
Safety Phrases:	S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S 39 Wear eye/face protection. S 46 If swallowed, seek medical advice immediately and show this container or label.
WGK (Water Danger/Protection):	CAS# 7681-57-4: 1 CAS# 7446-09-5: 1
Canada - DSL/NDSL:	CAS# 7681-57-4 is listed on Canada's DSL List. CAS# 7446-09-5 is listed on Canada's DSL List.
Canada – WHMIS:	This product has a WHMIS classification of D2B.

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

Canadian Ingredient Disclosure List:	CAS# 7681-57-4 is listed on the Canadian Ingredient Disclosure List. CAS# 7446-09-5 is listed on the Canadian Ingredient Disclosure List.

Section 16 – Other Information

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Section 1 – Product and Company Information

Reagent/Buffer Name: M-Dilution Buffer
Catalog Number: D5001-2, D5002-2, D5005-2, D5006-2

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

Section 2 – Ingredient Information/Composition

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

Dangerous Components Name	CAS #	EINEC No.	Formula	Concentration
Sodium Hydroxide	1310-73-2	215-185-5	NaOH	200mM to 2M
Water	7732-18-5	231-791-2	H2O	

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:	11
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.

Section 16 – Other Information

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Section 1 – Product and Company Information

Reagent/Buffer Name: M-Solubilization Buffer
Catalog Number: D5020-7, D5021-7

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	$C_3H_8O_3$	20%

Section 3 – Hazard Identification

Target Organs: Kidneys

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

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

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

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

Section 4 – First Aid Measures

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

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).

Section 16 – Other Information

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Section 1 – Product and Company Information

Reagent/Buffer Name: M-Reaction Buffer
Catalog Number: D5020-8, D5021-8

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	10-40%

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: M-Binding Buffer
Catalog Number: D5001-3, D5002-3, D5005-3, D5006-3

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.	

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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: M-Wash Buffer
Catalog Number: D5001-4, D5002-4, D5007-4

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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Material Safety Data Sheet

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Section 1 – Product and Company Information

Reagent/Buffer Name: M-Desulphonation Buffer
Catalog Number: D5001-5, D5002-5

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
Water	7732-18-5	231-791-2	H2O	

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:	12-13
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.

Section 16 – Other Information

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Section 1 – Product and Company Information

Reagent/Buffer Name: M-Elution Buffer
Catalog Number: D5028, D5001-6, D5002-6, D5007-6

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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