



ZYMO RESEARCH
The Beauty of Science is to Make Things Simple

Material Safety Data Sheet

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

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

Section 1 – Product and Company Information

Reagent/Buffer Name: RNA Lysis Buffer (Component A)
Catalog Number: R1060-1-50, R1060-1-100

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
Guanidine Thiocyanate	593-84-0	209-812-1	CH ₅ N ₃ CHNS	≤ 6M

Section 3 – Hazard Identification

Harmful by inhalation and ingestion. Irritating to skin and eyes. Light sensitive. May cause central nervous system effects. May cause respiratory and digestive tract irritation. May cause severe eye and skin irritation with possible burns. Target organ(s): Central nervous system. Labeling: Xn, harmful, R 20/21/22-32.

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 large volumes of 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: Keep victim warm and calm. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get immediate medical attention.

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.

Notes To Physician: Treat symptomatically and supportively.

Antidote: No specific antidote exists.

Section 5 – Fire Fighting Measures

Extinguishing Media: Water spray. Carbon dioxide, dried chemical powder, carbon dioxide or appropriate foam.

Special Fire Fighting Procedures: Wear self-contained breathing apparatus MSHA/NIOSH (approved or equivalent), and protective garments. If possible, have this product removed from the fire scene.

Section 6 – Accidental Release Measures

General Information: Wear self-contained breathing apparatus, MSHA/NIOSH (approved or equivalent), chemical safety goggles, rubber boots, and heavy rubber gloves.

Spills / Leaks: Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions.

Section 7 – Handling and Storage

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

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. 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

Odor: None

Melting Point: 243°F

Flashpoint: > 67°C

Vapor Pressure: Negligible

Solubility In Water: Soluble in water

Section 10 – Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions To Avoid: High temperatures, incompatible materials, light.

Substances To Be Avoided: Thiocyanate compounds are incompatible with chlorates, nitrates, nitric acid, organic peroxides, oxidizing agent, peroxides, potassium chlorate, and sodium chlorate.

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

Hazardous Polymerization: Has not been reported.

Section 11 – Toxicological Information

Acute Effects	
Inhalation:	May be harmful by inhalation. Material is destructive to mucous membranes and upper respiratory tract.
Eye Contact:	May cause severe eye irritation.
Skin Contact:	May cause severe skin irritation with possible burns.
Ingestion:	Harmful if swallowed.
Target Organs:	Central nervous system.
Prolonged Exposure:	N/A
Chronic Effects:	N/A
RTECS Number:	XL1225000
Toxicity Data:	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

Dispose of in a manner consistent with federal, state, and local regulations.
RCRA D-Series Maximum Concentration of Contaminants: Not Listed.
RCRA D-Series Chronic Toxicity Reference Levels: Not Listed.
RCRA F-Series: Not Listed.
RCRA P-Series: Not Listed.
RCRA U-Series: Not Listed.
Not listed as a material banned from land disposal according to RCRA.

Section 14 – Transport Considerations

US DOT: Not a DOT controlled material (United States).
IATA: Non-hazardous for air transport.

Section 15 – Regulatory Information

TSCA: CAS No.: 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.
SARA: Section 302 (RQ): None of the chemicals in this material have an RQ.
Section 302 (TPQ): None of the chemicals in this product have a TPQ.
SARA Codes: Acute.
Clean Air Act: This material does not contain any hazardous air pollutants, Class 1 Ozone depleters, or Class 2 Ozone depleters.

Clean Water Act:	None of the chemicals in this product are listed as hazardous substances under the CWA, Priority Pollutants under the CWA, or Toxic Pollutants under the CWA.
OSHA:	None of the chemicals in this product are considered highly hazardous by OSHA.
STATE:	Not present on state lists from CA, PA, MN, MA, FL, or NJ.
California No Significant Risk Level:	None of the chemicals in this product are listed.
European Labeling	
Hazard Symbols:	Xn
Risk Phrases:	R 20/21/22 Harmful by inhalation, in contact with skin and if swallowed. R 32 Contact with acids liberates very toxic gas.
Safety Phrases:	S 22 Do not inhale. S 24-25 Avoid contact with skin and eyes. 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.: 593-84-0
Canada:	Listed on Canada's DSL List. This product has a WHMIS Classification of D1B, D2B. Not listed on Canada's Ingredient Disclosure List.

Section 16 – Other Information

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Reagent/Buffer Name: RNA Lysis Buffer (Component B)
Catalog Number: R1060-1-50, R1060-1-100

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
N-Lauroylsarcosine, N-Lauroylsarcosine, Sarcosyl, Sodium Lauroyl Sarcosinate	137-16-6	C ₁₅ H ₂₈ NO ₃ Na	≤ 4%

Section 3 – Hazard Identification

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

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

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

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 swallowed, 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

Extinguishing Media:	Water spray, dried chemical powder, or appropriate foam.
Flammability:	May be combustible at high temperature.
Products of Combustion:	Carbon oxides (CO, CO ₂), nitrogen oxides (NO, NO ₂ ...).
Fire Hazards in Presence of Various Substances:	Slightly flammable to flammable in presence of heat. Non-flammable in presence of shocks.

Section 6 – Accidental Release Measures

Spills / Leaks:	Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Dispose according to local and regional authority requirements.
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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. Keep away from heat and sources of ignition.
Storage:	Keep container tightly closed in a dry and well-ventilated place. Do not store above 25°C (77°F).

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.

Section 9 – Physical and Chemical Properties

Physical States / Form:	Solid
Color:	White
Odor:	N/A
Melting point:	140°C (284°F)
Boiling Point:	N/A
Flashpoint:	N/A
Vapor Pressure:	N/A
pH:	8 (Basic) in a 10% Solution
Specific Gravity:	N/A
Solubility In Water:	Soluble in cold water, hot water.

Section 10 – Stability and Reactivity

Chemical Stability:	Stable.
Conditions To Avoid:	Excess heat, incompatible materials, dust generation.
Substances To Be Avoided:	Reactive with oxidizing agents.
Hazardous Polymerization:	Will not occur.

Section 11 – Toxicological Information

Acute Effects	
Inhalation:	May cause respiratory tract and mucous membrane irritation.
Eye Contact:	May cause eye irritation.
Skin Contact:	May cause skin irritation.
Ingestion:	May cause irritation of the digestive tract.
Toxicity To Animals	Not available.
Chronic Effects On Humans:	Not available.
Routes Of Entry:	Inhalation, Ingestion

Section 12 – Ecological Information

No information available.

Section 13 – Disposal Considerations

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

Section 14 – Transport Considerations

US DOT: Not a DOT controlled material.

Section 15 – Regulatory Information

Federal and State Regulations:	TSCA 8(b) inventory: N-Lauroylsarcosine, Sodium salt.
Other Regulations:	EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances
Other Classifications:	WHMIS (Canada): Not controlled under WHMIS (Canada). DSCG (EEC): R36/38- Irritating to eyes and skin. S2- Keep out of the reach of children. S24/25- Avoid contact with skin and eyes. S46- If swallowed, seek medical advice immediately and show this container or label.

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Section 1 – Product and Company Information

Reagent/Buffer Name: RNA Lysis Buffer (Component C)
Catalog Number: R1060-1-50, R1060-1-100

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
Titron X-100, p-tertiary-Octylphenoxy polyethyl alcohol, Polyethylene glycol octylphenyl ether; Octylphenoxy polyethoxyethanol; Polyethylene glycol mono [4-(1,1,3,3-tetramethylbutyl) phenyl] ether	9002-93-1	(C ₂ -H ₄ -O) _n C ₁₄ -H ₂₂ -O	≤ 4%

Section 3 – Hazard Identification

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

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

Potential Acute Health Effects: Inhalation: Irritating to respiratory system. May be harmful if inhaled
Eyes: Irritating to eyes.
Skin: Irritating to skin. May be harmful if absorbed through skin.
Ingestion: Harmful if swallowed.

Target Organs: Contains material which causes damage to the following organs: mucous membranes, upper respiratory tract, skin, eyes.

Section 4 – First Aid Measures

In Case of

Eye Contact:	Flush contaminated eye(s) with large volumes of water for at least 15 minutes. Check for and remove any contact lenses. 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 swallowed, do NOT induce vomiting unless directed to do so by medical personnel. Wash out mouth with water. If unconscious, place in recovery position and 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 attention.

Section 5 – Fire Fighting Measures

Extinguishing Media:	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Flammability:	In a fire or if heated, a pressure increase will occur and the container may burst.
Products of Combustion:	Carbon oxides (CO, CO ₂).
Special Protective Equipment For Fire-Fighters:	Wear protective equipment and self contained breathing apparatus for firefighting if necessary.

Section 6 – Accidental Release Measures

Spills / Leaks:	Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal. Dispose according to local and regional authority requirements.
Personal Precautions:	Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation.
Environmental Precautions:	Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

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. Keep away from heat and sources of ignition.
Storage:	Keep container tightly closed in a dry and well-ventilated place.

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.

Section 9 – Physical and Chemical Properties

Physical States / Form:	Liquid
Color:	Light yellow
Melting Point:	6°C (43°F)
Boiling Point:	> 200 °C (> 392 °F)
Flashpoint:	Closed cup: 274°C (525.2°F)
Vapor Pressure:	<0.1 kPa (at 20°C)
Vapor Density:	>1 [Air = 1]
Solubility In Water:	Soluble

Section 10 – Stability and Reactivity

Chemical Stability:	Stable.
Conditions To Avoid:	No specific data.
Substances To Be Avoided:	Strong acids, Strong bases, Strong oxidizing agents.
Hazardous Decomposition Products:	Hazardous decomposition products formed under fire conditions. Carbon oxides.
Hazardous Polymerization:	Will not occur.

Section 11 – Toxicological Information

Acute Toxicity:	Oral Rat LD50: 1800 mg/ kg
Mutagenicity:	Not available
Carcinogenicity:	Not available
Teratogenicity:	Not available
Reproductive Effects:	Not available
RTECS No.:	MD0907700

Section 12 – Ecological Information

No information available.

Section 13 – Disposal Considerations

Dispose of in a manner consistent with federal, state, and local regulations. Contact a licensed professional waste disposal service to dispose of this material.

Section 14 – Transport Considerations

US DOT Hazard Class:	Not a DOT controlled material.
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Section 15 – Regulatory Information

TSCA 8(b) Inventory:	TRITON X-100
California Prop. 65 Components:	<p>This product contains the following ingredients for which the State of California has found to cause reproductive harm (female) which would require a warning under the statute: Ethylene Oxide.</p> <p>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.</p> <p>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: Ethylene Oxide.</p>
WHMIS (Canada):	CLASS D2B: Material causing other toxic effects (TOXIC).
DSCL (EEC):	R22- Harmful if swallowed. R41- Risk of serious damage to eyes. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S39- Wear eye/face protection.

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Section 1 – Product and Company Information

Reagent/Buffer Name: RNA Prep Buffer (Component A)
Catalog Number: R1060-2-10, R1060-2-25

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 ₆ N ₃ Cl	≤ 4M

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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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	≤ 80%

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 Health 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 °C (61.99 °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, CO ₂).
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.
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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 °C
Boiling Point:	78 °C
Flashpoint:	16.66 °C (61.99 °F)
Vapor Pressure:	59.3 mm Hg at 25 °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/NDL: 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

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



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Material Safety Data Sheet

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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: RNA Wash Buffer
Catalog Number: R1003-3-6, R1003-3-12, R1003-3-24, R1003-3-48

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	C ₄ H ₁₁ NO ₃ .HCL	≤ 1%
Ethylenediaminetetraacetic Acid, pH 8.0	6381-92-6	205-358-3	C ₁₀ H ₁₄ N ₂ Na ₂ O ₈ •2H ₂ O	≤ 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.
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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: 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°C (212°F)
Melting Point:	0°C (32°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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