



ZYMO RESEARCH
The Beauty of Science is to Make Things Simple

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: Urine RNA Buffer
Catalog Number: R1038-2-20, R1038-2-50

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

Section 2 – Ingredient Information/Composition

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

Dangerous Components Name	CAS #	EINEC No.	Formula	Concentration
Guanidine Thiocyanate	593-84-0	209-812-1	CH ₅ N ₃ CHNS	4 M

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

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



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Section 1 – Product and Company Information

Reagent/Buffer Name: 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.

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Section 1 – Product and Company Information

Reagent/Buffer Name: RNA Elution Buffer
Catalog Number: R1003-4-1

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 #	Formula	Concentration
DTT, 1,4-Dimercapto-, 2,3-Butanediol, Cleland's Reagent, DL-1,4-Dithiothreitol, DL-Dithiothreitol, DL-Threo-, DL-Threo-1,4-Butanediol, RAC-Dithiothreitol	3483-12-3	C ₄ H ₁₀ O ₂ S ₂	5 mM

Section 3 – Hazard Identification

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

Target Organs: Central nervous system

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

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

Section 4 – First Aid Measures

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

Skin Contact:	Wash contaminated areas with soap and water as contaminated clothing is removed. Do not wear contaminated clothing until after it has been properly cleaned. Get medical attention if symptoms occur.
Ingestion:	If victim is conscious wash out mouth with water. Get medical attention.
Inhalation:	Remove to fresh air. Give oxygen if breathing is difficult. Give artificial respiration if victim is not breathing. Get medical attention.

Section 5 – Fire Fighting Measures

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

Section 6 – Accidental Release Measures

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

Section 7 – Handling and Storage

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 refrigerated at 2-8°C and tightly closed.

Section 8 – Exposure Controls / Personal Protection

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

Section 9 – Physical and Chemical Properties

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

Section 10 – Stability and Reactivity

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

Section 11 – Toxicological Information

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

Toxicity Data:

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

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

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

No information available.

Section 13 – Disposal Considerations

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

Section 14 – Transport Considerations

Not regulated.

Section 15 – Regulatory Information

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

Section 12b: None of the chemicals are listed.
TSCA Significant New Use Rule None of the chemicals in this material have a SNUR under TSCA.
SARA: Section 302: None of the chemicals in this product have a TPQ.
Codes: Immediate
Clean Air Act: This material does not contain any hazardous air pollutants, Class 1 Ozone 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/International Information

Hazard Symbols:

XN: Harmful

Risk Phrases:

R22: Harmful if swallowed

R 36/37/38: Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 37/39: Wear suitable gloves and eye/face protection

S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

Canada DSL/NDL:

CAS No: 3483-12-3 is listed.

WHMIS:

This product has a WHMIS classification of D2B, D1B

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

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