

Material Safety Data Sheet



Revision Date 2017. 03. 20

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product name	TOPreal™ qPCR 2X PreMIX (SYBR Green with low ROX, UDG plus)
Product code	RT500US, RT500UM
Recommended use of the chemical and restrictions on use	
Recommended use	For research use only
Restrictions on use	For research use only
Details of the supplier	
Company name	Enzynomics Inc.
Address	Munji-ro 281-9, Yuseong-gu, Daejeon, 34050, Korea
Emergence contact number	+82-42-719-1023

2. HAZARDS IDENTIFICATION

Classification of Hazards and dangerousness	No relevant classification
Warning article including prevention methods	
Pictorial symbol	No information available
Category	No information available
Hazards and dangerousness	No information available
Prevention methods	
Prevention	No information available
Action	No information available
Store	No information available
Discard	No information available
Other hazards and dangerousness (NFPA) not included in classification	
Dimethyl sulfoxide	
Health	1
Fire	1
Reactivity	0

3. COMPOSITION/INFORMATION ON INGREDIENTS

Material name	Usual name	CAS No.	Amount (%)
Dimethyl sulfoxide	SULFINYLBISMETHANE	67-68-5	< 5

4. FIRST AID MEASURES

Eye contact	Take medical action immediately. Immediately rinse skin and eyes thoroughly with plenty of running water for at least 20 minutes.
Skin contact	Take medical action immediately. Immediately rinse skin and eyes thoroughly with plenty of running water for at least 20 minutes. Remove contaminated clothes and shoes and isolate contaminated area Completely wash clothes and shoes before reuse
Inhalation	Remove to fresh air CPR when there is no breathing Provide Oxygen when breathing is difficult
Ingestion	Take medical action immediately. Do not provide any food for unconscious person
Note to physicians	Take protective action according to the material Do not inject adrenalin

5. FIRE FIGHTING MEASURES

Proper (improper) fire extinguishing agents

Small fire: dry sand, dry chemical, alcohol-resistant foam, water spray, regular foam, CO₂ (suitable extinguishing agent)

Large fires: water spray / mist, regular foam (suitable extinguishing agent)

High pressure water (improper extinguishing agent)

Specific hazards from chemical compounds

Can be ignited by heat, spark, flame

Container may explode on heating

Some can ride, but not easily ignite

May cause irritation and poisonous gas in case of fire

Inhalation of the substance may be harmful

Some fluids may cause dizziness, suffocation-inducing vapors

Protective equipment and precautions for fire fighting

Dimethyl sulfoxide

If it is not dangerous move container in fire area

In case of tank fire, Cool containers with large amounts of water even after extended fire has extinguished.

In case of tank fire, if there is a high sound level in the pressure relief device or if the tank is discolored, immediately withdraw it

Stand away from tank covered with flames

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Micro particles can ignite fire or explosion therefore remove all the sources of fire.

Stop leak if it is not dangerous

Give attention to materials and conditions that should be avoid

Do not enter the space without proper respirator or respirator until proper air (oxygen concentration 18 ~ 23.5%) is available.

Prevent entry into waterways, sewers, basements, and confined spaces.

Environmental precautions

In case of small leakage, flush contaminated area with large amount of water

Containment and cleaning up

In case of small leakage, absorb with sand and non-combustible material and place in container.

In case of large leakage, make a ditch away from liquid spills

Put spills into a clean, dry container with clean shovel, loosely closed, then transfer container from leak area

In case of powder leakage, cover with plastic sheet to prevent spread and keep dry

7. HANDLING AND STORAGE

Precautions for safe handling

Note the substances and conditions to avoid

Wash thoroughly after handling

Note the high temperature

In case of material leakage, reduce the oxygen concentration in the air and cause suffocation in an enclosed space, so be careful not to spill

Check the oxygen concentration before entering the place because there is a risk of loss of consciousness or death due to oxygen deficiency at high concentration in the air

Keep this temperature below 20°C because this material evaporates slowly and reaches hazardous concentrations.

Do not spray because it will evaporate faster if sprayed

Conditions for safe storage

Keep it tightly closed

Store in a cool, dry place

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure standard of chemical compound, biological exposure standard

Domestic regulations

Dimethyl sulfoxide

No information available

ACGIH regulation

Dimethyl sulfoxide

No information available

Biological release regulation	
Dimethyl sulfoxide	No information available
Proper engineering management	Keep air levels below the exposure guidelines
Individual protection equipment	
Respiratory protection	Use respiratory protection equipment certified by Korea occupational safety and health agency in a release of gas/liquid according to their chemical physical properties.
Eye protection	Use chemical protection glasses and safety glasses Install eyewash and emergency shower near work area
Hand protection	Wear suitable chemical resistant gloves
Body protection	Wear suitable chemical resistant clothing

9. PHYSICAL AND CHEMICAL PROPERTIES

Dimethyl sulfoxide

Appearance

State	Liquid
Color	No color
Odor	Slight smell of sulfur odor or smell of garlic clams
Odor threshold	No information available
pH	No information available
Melting point/freezing point	18 °C
Early boiling point and range	189 °C
Flashing point	95 °C
Evaporation rate	No information available
Evaporation rate (solid/liquid)	No information available
Maximum / minimum evaporation or explosion range	2.6 / 42.0 %
Steam pressure	0.609 mmHg
Solubility	25.3 g/100 ml
Vapor density	2.71 ((air=1))
Specific gravity	1.1 ((water=1))
n-octanol/ distribution coefficient	-1.35
Self-ignition temperature	215 °C
Disassemble temperature	No information available
Viscosity	1.1 cP (at 27 C)
Molecular weight	78.14

10. STABILITY AND REACTIVITY

Chemical stability and possibility of hazardous reactions

Dimethyl sulfoxide	Stable at normal temperature and pressure Container may explode on heating May cause irritation and poisonous gas in case of fire
Situation to avoid	
Dimethyl sulfoxide	Store for form Heat source, spark, flame, etc.
Materials to avoid	
Dimethyl sulfoxide	No information available
Harmful material produce by degradation	
Dimethyl sulfoxide	No information available

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Dimethyl sulfoxide	Can absorb body by suction Can be absorbed by suction and extinguisher Through skin, digestive system, can absorb body by inhalation of aerosol Able to absorb body by suction of steam Can be absorbed by inhalation, skin and digestive system
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Health maleficence information

Acute poison

Oral

Dimethyl sulfoxide LD50 > 20000 mg/kg (mouse)

Ingestion

Dimethyl sulfoxide LD50 20000 ~ 40000 mg/kg Rabbit

Inhalation

Dimethyl sulfoxide No information available

Skin corrosion or irritant agent

Dimethyl sulfoxide Very weak or erythematous on rabbit test
Temporary erythema, burning, smeared, itching in the body

Serious eye damage or irritation

Dimethyl sulfoxide Repeated drip infusion into rabbit eyes will only cause temporary tears, but will not show any change in iris, cornea, lens, retina, conjunctiva, or eyelids

Respiratory organ hypersensitiveness

Dimethyl sulfoxide No information available

Skin hypersensitiveness

Dimethyl sulfoxide No information available

Carcinogenic

Occupational safety and health acts

Dimethyl sulfoxide No information available

Employment announcement

Dimethyl sulfoxide No information available

IARC

Dimethyl sulfoxide No information available

OSHA

Dimethyl sulfoxide No information available

ACGIH

Dimethyl sulfoxide No information available

NTP

Dimethyl sulfoxide No information available

EU CLP

Dimethyl sulfoxide No information available

Germ cell mutagenicity

Dimethyl sulfoxide In vitro Salmonella typhimurium Ames test, with or without metabolic activation in CHO cell
Negative in In vivo Micronucleus Assay

Reproduction toxicity test

Dimethyl sulfoxide No effect on estrus cycle and semen factors (survival and morphology)

Special target poison (1 time exposer)

Dimethyl sulfoxide No information available

Special target poison (long exposer)

Dimethyl sulfoxide 13 weeks inhalation Repeated toxicity No systemic toxicity when administered

Absorption injurious

Dimethyl sulfoxide No information available

12. ECOLOGICAL INFORMATION

Ecotoxicity

Fish	
Dimethyl sulfoxide	LC50 32300 mg/l 96 hr <i>Lepomis cyanellus</i>
Crustacean	
Dimethyl sulfoxide	EC50 24600 mg/l 48 hr <i>Daphnia magna</i>
Algae	
Dimethyl sulfoxide	EC50 12350 ~ 25500 mg/l 96 hr <i>Skeletonema costatum</i>

Residual fungicide and resolvability

Residual fungicide

Dimethyl sulfoxide log Kow -1.35

Resolvability

Dimethyl sulfoxide No information available

Life enrichment

Enrichment

Dimethyl sulfoxide BCF < 0.4

Biodegradability

Dimethyl sulfoxide 3.1 (%) 28 day

Soil

Dimethyl sulfoxide No information available

Other harmful influences

Dimethyl sulfoxide No information available

13. DISPOSAL CONSIDERATIONS

Waste treatment method

Dimethyl sulfoxide If specified in the Waste Management Act, consider the precautions specified in the regulations.

Disposal considerations

Dimethyl sulfoxide If specified in the Waste Management Act, consider the precautions specified in the regulations.

14. TRANSPORT INFORMATION

IATA

Propriety shipping name

Dimethyl sulfoxide No dangerous good in sense of these transport regulations

Hazard class

Dimethyl sulfoxide No information available

Subsidiary class

Dimethyl sulfoxide No information available

Packing group

Dimethyl sulfoxide No information available

UN-No

Dimethyl sulfoxide No information available

Environmental hazards

Dimethyl sulfoxide No information available

15. REGULATORY INFORMATION

Regulations of occupational safety and health act

Dimethyl sulfoxide No information available

Regulations of toxic chemicals regulation act

Dimethyl sulfoxide No information available

Regulations of safety control of dangerous substances act

Dimethyl sulfoxide	4th class The third kind Petroleum(Receptivity) 4000 L
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Regulations of waste control act

Dimethyl sulfoxide	Designated waste
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Regulations of other domestic and international act**Domestic act****Persistent organic pollutants control act**

Dimethyl sulfoxide	No information applicable
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Foreign act**American supervision information**

Dimethyl sulfoxide	No information applicable
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CERCLA

Dimethyl sulfoxide	No information applicable
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EPCRA 302

Dimethyl sulfoxide	No information applicable
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EPCRA 304

Dimethyl sulfoxide	No information applicable
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EPCRA 313

Dimethyl sulfoxide	No information applicable
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American supervision information (Rotterdam agreement material)

Dimethyl sulfoxide	No information applicable
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American supervision information (Stockholm agreement material)

Dimethyl sulfoxide	No information applicable
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American supervision information (Montreal protocol material)

Dimethyl sulfoxide	No information applicable
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EU Classification information (Confirmed classification results)

Dimethyl sulfoxide	No information applicable
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EU Classification information (Danger expression)

Dimethyl sulfoxide	No information applicable
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EU Classification information (Safety expression)

Dimethyl sulfoxide	No information applicable
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16. OTHER INFORMATION

Source of material

ICSC (constellation)

Corporate Solution From Thomson Micromedex (<http://csi.micromedex.com>) (Color)National Institute of Technology and Evaluation (NITE) (http://www.safe.nite.go.jp/ghs/h18_bunrui.html) (Melting point / Freezing point)National Institute of Technology and Evaluation (NITE) (http://www.safe.nite.go.jp/ghs/h18_bunrui.html) (Initial boiling point and boiling range)National Institute of Technology and Evaluation (NITE) (http://www.safe.nite.go.jp/ghs/h18_bunrui.html) (Flash Point)International Chemical Safety Cards (ICSC) (<http://www.ilo.org/public/english/protection/safework/cis/products/icsc/dtasht/index.htm>) (upper or lower limit of the print or explosion range)National Institute of Technology and Evaluation (NITE) (http://www.safe.nite.go.jp/ghs/h18_bunrui.html) (Vapor Pressure)National Institute of Technology and Evaluation (NITE) (http://www.safe.nite.go.jp/ghs/h18_bunrui.html) (Solubility)International Chemical Safety Cards (ICSC) (<http://www.ilo.org/public/english/protection/safework/cis/products/icsc/dtasht/index.htm>) (vapor density)National Institute of Technology and Evaluation (NITE) (http://www.safe.nite.go.jp/ghs/h18_bunrui.html) (weight)

ICSC (n-octanol / water partition coefficient)

National Institute of Technology and Evaluation (NITE) (http://www.safe.nite.go.jp/ghs/h18_bunrui.html) (Autoignition Temperature)

The Merck Index 13th Ed. (Molecular Weight)

International Uniform Chemical Information Database(IUCLID)(<http://ecb.jrc.it/esis>)(epigram)
OECD Screening Information Data Set(<http://cs3-hq.oecd.org/scripts/hpv/>)(Percutaneous)
OECD Screening Information Data Set(<http://cs3-hq.oecd.org/scripts/hpv/>)(Skin corrosive or irritant)
OECD Screening Information Data Set(<http://cs3-hq.oecd.org/scripts/hpv/>)(Severe eye damage or irritation)
OECD Screening Information Data Set(<http://cs3-hq.oecd.org/scripts/hpv/>)(Germ cell mutagenicity)
OECD Screening Information Data Set(<http://cs3-hq.oecd.org/scripts/hpv/>)(Reproductive toxicity)
OECD Screening Information Data Set(<http://cs3-hq.oecd.org/scripts/hpv/>)(Specific target organ toxicity (repeated exposure))
OECD Screening Information Data Set(<http://cs3-hq.oecd.org/scripts/hpv/>)(fish)
OECD Screening Information Data Set(<http://cs3-hq.oecd.org/scripts/hpv/>)(crustacean)
International Uniform Chemical Information Database(IUCLID)(<http://ecb.jrc.it/esis>)(agar)
ICSC(Persistence)
IUCLID(Enrichment)
Chemical Risk Information Platform (CHRIP)(<http://www.safe.nite.go.jp/english/db.html>)(Biodegradable)
The Chemical Database, The Department of Chemistry at the University of Akron(<http://ull.chemistry.uakron.edu/erd>)

The above information was acquired by diligent search and/or investigation and the recommendations are based on prudent application of professional judgment. The information shall not be taken as being all inclusive and is to be used only as a guide. All materials and mixtures may present unknown hazards and should be used with caution. Since Enzymomics, Inc. cannot control the actual methods, volumes, or conditions of use, the company shall not be held liable for any damages or losses resulting from the handling or from contact with the product as described herein.

Questions about the information found on this MSDS should be directed to info@enzymomics.com.

End of Material Safety Data Sheet