

# SAFETY DATA SHEET

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Product:** TRI Reagent, TRI Reagent LS, TRI Reagent BD, TRI Reagent RT  
**Cat. Nos.** TR 118, TS 120, TB 126, RT 111  
**Product:** RNAzol RT, RNAzol BD, RNAzol RT Column Kit, RNAzol BD Column Kit  
**Cat. Nos:** RN 190, RB 192, RC 290, RC 290T, RC 292, RC 292T

**Molecular Research Center, Inc.**

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**Product Name:** Tri Reagent, TRI Reagent LS, TRI Reagent BD, TRI Reagent RT

**Product Name:** RNAzol RT, RNAzol BD, RNAzol RT Column Kit, RNAzol BD Column Kit

Application: Nucleic acid extraction solution for tissue, cells, liquids and blood.

Synonym: Phenol solution

Chemical Formula: A formulation

Molecular Weight: A formulation

**CHEMTREC EMERGENCY NUMBER:** Only in the event of an emergency involving a spill, leak, fire exposure or accident. USA & Canada: 1-800-424-9300; International: +1-703-527-3887.

**For research use only.**

## 2. HAZARD IDENTIFICATION

### GHS - Classification

**Signal Word:** Danger



### **Health Hazards**

Hazard Class	Hazard category	Code	Health Hazard Statements
Acute toxicity, oral	Category 4	H302	Harmful if swallowed
Acute toxicity, dermal	Category 3	H311	Toxic in contact with skin
Acute toxicity, inhalation	Category 4*	H332	Harmful if inhaled
Skin/Eye corrosion/irritation	Category 1B	H314	Causes skin burns and eye damage
Specific target organ toxicity	Category 2	H373	May cause damage to organs via prolonged or repeated exposure
Germ cell mutagenicity	Category 2	H431	Suspected of causing genetic defects

\*Minimal inhalation hazard when used in fume hood or well-ventilated room. Prolonged inhalation of high concentrations of phenol fumes can be hazardous.

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**Physical Hazards** – Not hazardous

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**Environmental Hazards**

Chronic Aquatic Hazard	Category 3	H412	Harmful to aquatic life with long lasting exposure
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**Precautionary Statements**

**Prevention Statements**

P201	Obtain special instructions before use
P202	Do not handle until all safety precautions have been read and understood
P260	DO not breath dust/fume/gas/mist/vapors/spray
P261	Avoid breathing dust/fumes/gas/mist/vapors/spray
P264	Wash...thoroughly after handling
P270	Do not eat, drink or smoke when using this product
P271	Use in a well-ventilated area
P273	Avoid release to the environment
P280	Wear protective gloves/protective clothing/eye protection/face protection

**Response Statements**

P301+P312	If Swallowed: Call a POISON CENTER or doctor/physician if you feel unwell
P301+P330+P331	If Swallowed: Rinse mouth. Do not induce vomiting
P302+P361+P352	If on skin: Remove/take off contaminated clothing. Wash with plenty of soap and water.
P303+P361+P353	If on skin or hair: Immediately take off all contaminated clothing. Rinse skin with water/shower.
P304+P340	If Inhaled: Remove to fresh air and keep at rest in a comfortable position for breathing
P305+P351+P338	If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P306+P363	If on clothing: Wash contaminated clothing before reuse.
P309+P311	If exposed or you feel unwell: Call a POISON CENTER or doctor/physician.
P308+P313	If exposed or concerned: Get medical advice/attention
P314	Get medical advice/attention if you feel unwell

**Storage Statements**

P403+P233	Store in well-ventilated location. Keep container tightly closed.
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**Disposal Statements**

P501	Dispose of contents/containers t an approved waste disposal plant
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**HMIS Classification**

Health Hazard 3 \*

Flammability 1

Reactivity/Physical Hazard 0

Personal Protection C D

<b>3. COMPOSITION/Information on Ingredients</b>
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Component	Concentration
Phenol	CAS No. 108-95-2 EINECS No. 203-632-7 <50 %
Thiocyanic acid, Compound with guanidine	CAS No. 593-84-0 EINECS No. 209-812-1 <30%

#### 4. FIRST AID

**SKIN CONTACT:** Rescuers should wear protective clothing and gloves while treating patients whose skin is contaminated with phenol. Remove contaminated clothing and irrigate or wipe exposed areas immediately and repeatedly with low-molecular-weight polyethylene glycol (PEG 300 or PEG 400) which can be diluted to 50% for easier application. Treatment should be continued until there is no detectable odor. If PEG is not available, a glycerin solution, olive oil or vegetable oil can be used instead. Or, rinse with copious amounts of water and wash with soap and water for 15 minutes. In case of chemical burns, cover area with sterile, dry dressing and bandage securely but not tightly. Get medical attention immediately. Wash contamination clothing before reuse. Double-bag contaminated clothing and personal belongings. See the attached link for additional information ([Phenol | Toxic Substances | Toxic Substance Portal | ATSDR \(cdc.gov\)](#)).

**EYE CONTACT:** Carefully wash eyes immediately for at least 15 minutes and rinse under lids also. Remove contact lenses, if present and it is easy to do so. Get medical attention immediately.

**INGESTION:** Wash out mouth if vomiting occurs. Have person lean forward with head down to avoid breathing in vomit. Seek immediate medical attention. Do not induce vomiting unless directed to do so by medical personnel. Have conscious person drink several glasses of milk or water. Do not give anything by mouth to an unconscious person. Seek immediate hospital medical attention.

**INHALATION:** Remove from exposure to fresh air immediately. If breathing has stopped, give artificial respiration. Maintain airway and blood pressure and administer oxygen if available. Treat symptomatically and supportively. Oxygen should be administration by qualified personnel. Get medical attention immediately.

**Note to attending physician:** No known specific antidote. Areas of skin contact smaller than 100 cm<sup>2</sup> may cause a minor health hazard. Systemic doses less than 1 gm may cause a minor health hazard although individual sensitivity may vary. For ingestion exposure: give castor oil or other vegetable oil. Give charcoal slurry if conscious. Treat symptomatically. Observe for 24 hrs. Be prepared for emergency cardiovascular intervention. See the following link for additional information (<http://www.cdc.gov/niosh/docs/81-123/pdfs/0493.pdf>).

#### 5. FIRE FIGHTING MEASURES

Moderate fire hazard when exposed to heat or flame. Vapor-air mixtures are explosive above flash point. Vapors are heavier than air and may travel a considerable distance to a source of ignition and flash back. Fires involving phenol should be fought upwind from the maximum distance possible. Emergency personnel should stay away from low areas and ventilate closed spaces before entry.

Flash point: 110° C      D93 Method A

**EXTINGUISHING MEDIA:** Use Class B extinguishers (oils, hydrocarbon liquids.) Dry chemical, carbon dioxide, halon, water spray or standard foam (1987 Emergency Response Guidebook, DOT P 5800.4) for larger fires, use water spray, fog or standard foam (1987 Emergency Response Guidebook, DOT P 5800.4)

**FIREFIGHTING:** Standard procedure for chemical fires. Evacuate area. Wear positive pressure self-contained breathing apparatus. Extinguish using agents indicated. Phenol is combustible and containers may explode in fire. Avoid breathing toxic fumes produced under fire conditions.

#### 6. ACCIDENTAL RELEASE MEASURES

**PERSONAL PROTECTIVE EQUIPMENT:** Use gloves, boots, Tyvek suit or other impervious covering to avoid skin contact. Use chemical goggles, face shield, or other appropriate eye protection. Ensure adequate ventilation. Avoid contact with skin and eyes.

**SPILL AND LEAK PROCEDURES:** Restrict persons not wearing protective equipment from area. Remove all ignition sources. Neutralize spill with inert absorbent material. Collect powdered material and deposit in sealed containers and dispose as hazardous waste. Isolate area and deny entry.

U.S. DOT EMERGENCY GUIDE # 60

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK # 153

**ENVIRONMENTAL PRECAUTIONS:** Prevent product from entering drains or ground water systems.

## 7. HANDLING AND STORAGE

Observe all Federal, state, and local regulations when storing or disposing of this substance. Ensure adequate ventilation. Store in a cool, dry, well-ventilated location and away from direct sunlight, heat or sources of ignition. Avoid contact with hypochlorite, strong oxidizers such as chlorine and bromine. Use personal protective equipment. Avoid contact with skin and eyes. Use personal protective equipment.

Applications: For research use only.

## 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

**Phenol** OSHA PEL - 5 ppm (19 milligrams per cubic meter) 8-hour TWA; OSHA PEL (Ceiling) – none; ACGIH OEL (TWA) – 5ppm; ACGIH OEL (STEL) – none. **Thiocyanic acid, compound with guanidine** OSHA PEL, OSH PEL Ceiling), ACGIH OEL, ACGIH (STEL) – none.

**Use engineering measures to ensure adequate ventilation.**

**Avoid release to the environment.**

### GENERAL PROTECTION AND PRECAUTIONS EXPOSURE CONTROLS

**PROTECTIVE MEASURES:** Do not touch unprotected skin. Do not wear contact lenses while handling this product. Do not pipette by mouth. Area ventilation is generally adequate; use fume hood if available.

**AIR PURIFYING RESPIRATOR CANISTERS / CARTRIDGES:** Stacked cartridge for organic vapors (black ANSI color code, NIOSH approved) plus dust, mist (red ANSI color code, NIOSH approved).

**GLOVES AND PROTECTIVE CLOTHING:** User must wear appropriate (impervious) clothing and gloves (rubber or neoprene rubber) to prevent any possibility of skin contact with this substance.

**EYE PROTECTION:** Tightly sealing safety goggles as minimum eye protection.

**EMERGENCY WASH FACILITIES:** Eyewash and quick drench shower recommended.

**ROUTINE OPERATIONS:** Lab coats, safety glasses with side shields and gloves should be considered minimum body protection. Wash hands thoroughly after using the reagent and never eat, drink, use tobacco products, apply cosmetics or take medications where solution is handled, processed or stored. Always wash hands after using the reagent.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Liquid
Description:	Red to maroon color with a characteristic sweet, medicinal or tar-like odor. Blue with a characteristic sweet, medicinal or tar-like odor.
Boiling point:	110 C
Melting point:	Not applicable
Vapor pressure:	>0.35 mmHg @25C
Evaporation rate:	Not determined
Solvent solubility:	Soluble in water, methanol and glycerol; relatively soluble in aqueous alkali hydroxides, and dimethyl sulfoxide.

## 10. STABILITY AND REACTIVITY

**STABILITY:** Stable under normal temperatures and pressures.  
Avoid contact with acids and bleach: may liberate toxic gases. Do not add to acids or bleach in containers.

**INCOMPATIBILITIES:** Acetaldehyde: violent reaction.  
Aluminum and alloys: may corrode.  
Aluminum chloride + nitrobenzene: violent explosion.  
1, 3-butadiene, boron trifluoride, and diethyletherate: possible explosion  
Calcium hypochlorite: exothermic reaction with possible ignition.  
Formaldehyde: possible exothermic reaction.  
Lead and alloys: may corrode.  
Magnesium and alloys: may corrode.

**OXIDIZERS: (strong)** Fire and explosion hazard.  
Peroxodisulfuric acid: possible explosion.  
Peroxomonosulfuric acid: explosion.  
Plastics and rubber coatings: may corrode.  
Sodium nitrate + trifluoroacetic acid: violent exothermic reaction.  
Sodium nitrite: may explode.  
Zinc and alloys: may corrode.

**DECOMPOSITION:** Thermal decomposition products may include toxic oxides of carbon.  
Polymerization: Hazardous polymerization has not been reported to occur under normal temperatures and pressures.

**CORROSIVITY:** Slightly corrosive in the presence of stainless steel. Non-corrosive in glass.

## 11. TOXICOLOGICAL INFORMATION

**TOXICITY DATA: Human:** (phenol) 10 mg/kg oral LDLO. **Rat:** (phenol) 317 mg/kg oral LD50; (TRI Reagent) 673 mg/kg acute oral LD50; >1000 mg/kg acute dermal LD50. (TRI Reagent BD) 534 mg/kg acute oral LD50. (TRI Reagent RT) 1620 mg/kg acute oral LD50. (RNAzol RT) 840 mg/kg acute oral LD50; > 1000 mg/kg acute dermal LD50. (RNAzol BD) 900 mg/kg acute oral LD50; > 1000 mg/kg acute dermal LD50. (Guanidine thiocyanate) 593 mg/kg oral LD50. **Mouse:** (phenol) 270 mg/kg LD50 oral.

**PRINCIPLE ROUTES OF EXPOSURE:**

Acute toxicity: Harmful if swallowed. Harmful if inhaled. Harmful in contact with skin.

Skin/eye corrosion/irritation: Causes skin burns and eye damage.

Respiratory or skin sensitization, Single exposure STOT, Repeated exposure STOT, Carcinogenicity, Germ cell mutation, Reproductive toxicity, Aspiration hazard: Not classified based on available data.

Germ cell mutagenicity: Suspected of causing genetic defects.

**12. ECOLOGICAL INFORMATION****TOXICITY:**

Product. Toxicity to fish, algae, bacteria; no data available.

Phenol. Toxicity to fish, bacteria; no data available. Toxicity to algae; *Desmodesmus subspicatus* EC50 187-279 mg/L (72 h), *Pseudokirchneriella subcapitata* EC50 46 mg/L (96 h). Toxicity to daphnia and other aquatic invertebrates; *Daphnia magna* EC50 4-11 mg/L (48 h).

Thiocyanic acid, compound with guanidine. Toxicity to algae, fish, bacteria, invertebrates; no data available.

**MOBILITY IN SOIL, PERSISTENCE AND DEGRADABILITY, BIOACCUMULATION, RESULTS OF PBT AND vPvB ASSESSMENT:** No information available.

**13. DISPOSAL CONSIDERATIONS**

Minimize generation of waste. Dispose of material and container according to institutional and approved methods. Comply with all local, state and federal regulations.

**14. TRANSPORTATION INFORMATION****IATA / ADR / DOT-US / IMDG**

UN or ID Number: UN1760

UN Proper Shipping Name: Corrosive Liquid, N.O.S. (Phenol – Guanidine Thiocyanate Solution)

Transport Hazard Class: 8

Packing Group: II

Transport in bulk according to Annex II of MARPOL and IBC Code: Not applicable as supplied.

**15. REGULATORY INFORMATION**

OSHA: Classified as a HAZARDOUS CHEMICAL@ under US OSHA HAZCOM REGULATION.

TSCA: Some constituents of this product included in US EPA Toxic Substance Control Act (40 CFR part 710). Guanidine thiocyanate. Phenol.

SARA SECTION 302 Threshold Planning Quantity: 500/10,000 lbs.

CERCLA SECTION 103 Reportable quantity: 1000 lbs.

SARA SECTION 304 Reportable quantity: 1000 lbs.

SARA 311/312 Fire hazard, acute health hazard, chronic health hazard

SUBJECT TO SARA SECTION 313 Annual toxic chemical release reporting. Phenol 108-95-2, <50%. Threshold value 1.0.

CLEAN AIR ACT. Section 112 Hazardous Air Pollutants. Phenol is present 108-95-2, <50%.

Massachusetts, New Jersey, Pennsylvania. Right to Know. Phenol listed.  
Vermont, Washington. Chemicals of High Concern. Phenol listed.  
California. Hazardous Substances and Permissible Exposure Limits for Chemical Contaminants. Phenol listed.  
This product does not contain any Proposition 65 chemicals.

MAC (GERMANY): 5 ppm phenol in air, 19 mg/m<sup>3</sup> phenol with skin warning. EINECS # 2036327.

BRAZIL. Guanidine thiocyanate 593-84-0, phenol 108-95-2 not listed.

RISK PHRASE: R20/21/22. Harmful if inhaled. Harmful in contact with skin and if swallowed. R34, R41.  
Causes burns, risk of serious damage to eyes.

SAFETY PHRASE: S28. After contact with skin, wash immediately with plenty of detergent and water. S45. In case of accident, or if you feel unwell, seek medical attention.

SAFETY SYMBOL: CORROSIVE, HARMFUL

## 16. OTHER INFORMATION

Reviewed by	KM, SP
Creation date	9/01/94
Revision date	5/15/2024 SP

Reason for Revision: Sections updated.

This information is believed to be accurate and represents the information currently available to us. However, we make no warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes.