Safety Data Sheet

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Identification of the substance or mixture

Product code 15596026
Product name TRIZOL REAGENT

Company/undertaking identification

Life Technologies Corporation
5781 Van Allen Way
PO Box 6482
Carlsbad, CA 92008
+1 760 603 7200

Life Technologies
5250 Mainway Drive
Burlington, ONT
CANADA L7L 6A4
800/263-6236

24 hour Emergency Response:
866-536-0631
301-431-8585
Outside of the U.S. +1-301-431-8585

24 hour Emergency Response for Hazardous Materials [or Dangerous Goods] Incident. Spill, Leak, Fire, Exposure, or Accident. Call CHEMTREC
Within the USA + Canada: 1-800-424-9300 and +1 703-527-3887
Outside the USA + Canada: +1 703-741-5970

Country specific Emergency Number (if available):
CHEMTREC Brazil (Rio De Janeiro) +(55)-2139581449 (português)

For Research Use Only. Not for use in diagnostic procedures.

SECTION 2: Hazards identification

GHS - Classification

Signal Word DANGER

Hazard pictograms

Health hazards

<table>
<thead>
<tr>
<th>Health hazard</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute oral toxicity</td>
<td>Category 3</td>
</tr>
<tr>
<td>Acute dermal toxicity</td>
<td>Category 3</td>
</tr>
<tr>
<td>Acute Inhalation Toxicity - Vapors</td>
<td>Category 3</td>
</tr>
<tr>
<td>Skin corrosion/irritation</td>
<td>Category 1 B</td>
</tr>
</tbody>
</table>

Revision date 25-Apr-2017
Product code 15596026
Product name TRIZOL REAGENT

www.thermofisher.com
Serious eye damage/eye irritation
Category 1
Specific target organ systemic toxicity (single exposure)
Category 3
Specific target organ systemic toxicity (repeated exposure)
Category 2

Mutagenicity
Mutagenic category 2

Physical hazards
Not classified

Environmental hazards
Chronic aquatic toxicity
Category 3

Hazard Statements
H301 - Toxic if swallowed
H311 - Toxic in contact with skin
H331 - Toxic if inhaled
H314 - Causes severe skin burns and eye damage
H355 - May cause respiratory irritation
H341 - Suspected of causing genetic defects
H373 - May cause damage to organs through prolonged or repeated exposure
H412 - Harmful to aquatic life with long lasting effects

Precautionary Statements

Prevention
P201 - Obtain special instructions before use
P261 - Avoid breathing dust/fume/gas/mist/vapors/spray
P264 - Wash hands thoroughly after handling
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P273 - Avoid release to the environment

Response
P301 + P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
P303 + P361 + P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable 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

Storage
P403 + P233 - Store in a well-ventilated place. Keep container tightly closed

Disposal
P501 - Dispose of contents/ container to an approved waste disposal plant

Other hazards
No information available

HMIS

<table>
<thead>
<tr>
<th>Health</th>
<th>4 * Chronic Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammability</td>
<td>0</td>
</tr>
<tr>
<td>Reactivity</td>
<td>0</td>
</tr>
</tbody>
</table>
SECTION 3: Composition/information on ingredients

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>EINECS-No</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenol</td>
<td>108-95-2</td>
<td>203-632-7</td>
<td>30-60</td>
</tr>
<tr>
<td>108-95-2 (30-60)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guanidine isothiocyanate</td>
<td>593-84-0</td>
<td>209-812-1</td>
<td>15-40</td>
</tr>
<tr>
<td>593-84-0 (15-40)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ammonium thiocyanate</td>
<td>1762-95-4</td>
<td>217-175-6</td>
<td>7-13</td>
</tr>
<tr>
<td>1762-95-4 (7-13)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Contact with acids or bleach liberates toxic gases. DO NOT ADD acids or bleach to any liquid wastes containing this product. We recommend handling all chemicals with caution.

SECTION 4: First aid measures

Description of first aid measures

Skin contact: Rinse with plenty of water. Immediate medical attention is not required.

Eye contact: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.

Ingestion: Not expected to present a significant ingestion hazard under anticipated conditions of normal use. If you feel unwell, seek medical advice.

Inhalation: Not expected to be an inhalation hazard under anticipated conditions of normal use of this material. Consult a physician if necessary.

Notes to Physician: Treat symptomatically.

Most important symptoms and effects, both acute and delayed

- H301 - Toxic if swallowed
- H311 - Toxic in contact with skin
- H331 - Toxic if inhaled
- H314 - Causes severe skin burns and eye damage
- H335 - May cause respiratory irritation
- H341 - Suspected of causing genetic defects
- H373 - May cause damage to organs through prolonged or repeated exposure
- H412 - Harmful to aquatic life with long lasting effects

Indication of any immediate medical attention and special treatment needed

IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. If skin irritation or rash occurs: Get medical advice/attention. IF INHALED: Remove person to fresh air and keep comfortable for breathing.

SECTION 5: Firefighting measures

Extinguishing media

- Unsuitable extinguishing media: No information available.

Special hazards arising from the substance or mixture: Not known.

Advice for fire-fighters: Standard procedure for chemical fires.
SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures
Ensure adequate ventilation. Always wear recommended Personal Protective Equipment. Use personal protection equipment. See Section 8 for more detail.

Environmental precautions

Methods and material for containment and cleaning up
Soak up with inert absorbent material.

Reference to other sections
See section 8 for more information.

SECTION 7: Handling and storage

Precautions for safe handling
Use personal protective equipment as required. No special handling advices are necessary.

Conditions for safe storage, including any incompatibilities
Keep in a dry, cool and well-ventilated place. Keep in properly labeled containers.

Specific end use(s)
For research use only.

SECTION 8: Exposure controls/personal protection

Control parameters

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>OSHA PEL</th>
<th>OSHA PEL (Ceiling)</th>
<th>ACGIH OEL (TWA)</th>
<th>ACGIH OEL (STEL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenol</td>
<td>5 ppm</td>
<td>None</td>
<td>5 ppm</td>
<td>None</td>
</tr>
<tr>
<td>Guanidine isothiocyanate</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Ammonium thiocyanate</td>
<td>5 mg/m³</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

Engineering measures
Ensure adequate ventilation, especially in confined areas

Exposure controls

Personal Protective Equipment

Respiratory protection
In case of insufficient ventilation wear respirators and components tested and approved under appropriate government standards.

Hand protection
Wear suitable gloves Glove material: Compatible chemical-resistant gloves.

Eye protection
Tight sealing safety goggles

Skin and Body Protection
Wear suitable protective clothing

Hygiene measures
Handle in accordance with good industrial hygiene and safety practice

Environmental exposure controls
## SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>liquid</td>
</tr>
<tr>
<td>Odor</td>
<td>No data available</td>
</tr>
<tr>
<td>Melting point / melting range</td>
<td>°C Mixture has not been tested</td>
</tr>
<tr>
<td>Boiling point / boiling range</td>
<td>°C Mixture has not been tested</td>
</tr>
<tr>
<td>Flash point</td>
<td>°C Mixture has not been tested</td>
</tr>
<tr>
<td>Autoignition Temperature</td>
<td>°C Mixture has not been tested</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>°C Mixture has not been tested</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>No data available</td>
</tr>
<tr>
<td>Upper explosion limit</td>
<td>Mixture has not been tested</td>
</tr>
<tr>
<td>Lower explosion limit</td>
<td>Mixture has not been tested</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>Mixture has not been tested</td>
</tr>
<tr>
<td>Relative density</td>
<td>Mixture has not been tested</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>No data available</td>
</tr>
<tr>
<td>Solubility</td>
<td>No data available</td>
</tr>
<tr>
<td>Partition coefficient:</td>
<td>No data available</td>
</tr>
<tr>
<td>n-octanol/water</td>
<td>Mixture has not been tested</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Mixture has not been tested</td>
</tr>
<tr>
<td>Other information</td>
<td>No data available</td>
</tr>
</tbody>
</table>

## SECTION 10: Stability and reactivity

### Reactivity

None known.

### Chemical stability

Stable under normal conditions.

### Possibility of hazardous reactions

Hazardous reaction has not been reported.

### Conditions to avoid

Contact with acids or bleach liberates toxic gases. DO NOT ADD acids or bleach to any liquid wastes containing this product.

### Incompatible materials

No dangerous reaction known under conditions of normal use.

### Hazardous decomposition products

No data available.
SECTION 11: Toxicological information

Information on toxicological effects

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>LD50 (oral, rat/mouse)</th>
<th>LD50 (dermal, rat/rabbit)</th>
<th>LC50 (inhalation, rat/mouse)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenol</td>
<td>= 340 mg/kg (Rat) = 317 mg/kg (Rat)</td>
<td>No data available</td>
<td>= 316 mg/m³ (Rat)</td>
</tr>
<tr>
<td>Guanidine isothiocyanate</td>
<td>764 mg/kg</td>
<td>2000 mg/kg</td>
<td>5.319 mg/L (4H)</td>
</tr>
<tr>
<td>Ammonium thiocyanate</td>
<td>= 750 mg/kg (Rat)</td>
<td>No data available</td>
<td>No data available</td>
</tr>
</tbody>
</table>

Principal Routes of Exposure

- **Irritation**: Skin irritation, Serious Eye Damage / Eye Irritation
- **Corrosivity**: Causes severe skin burns and eye damage
- **Sensitization**: Conclusive but not sufficient for classification
- **STOT - Single Exposure**: May cause respiratory irritation
- **STOT - Repeated Exposure**: Conclusive but not sufficient for classification
- **Carcinogenicity**: Conclusive but not sufficient for classification
- **Mutagenicity**: Product is or contains a chemical which may cause mutations in the germ cells of humans.
- **Reproductive toxicity**: Conclusive but not sufficient for classification
- **Aspiration hazard**: Conclusive but not sufficient for classification

SECTION 12: Ecological information

Toxicity
The environmental impact of this product has not been fully investigated.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Freshwater Algae Data</th>
<th>Water Flea Data</th>
<th>Freshwater Fish Species Data</th>
<th>Microtox Data</th>
<th>log Pow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenol</td>
<td>Desmodesmus subspicatus EC50 187 - 279 mg/L (72 h)</td>
<td>Daphnia magna EC50 4.24 - 10.7 mg/L (48 h)</td>
<td>No data available</td>
<td>No data available</td>
<td>logPow1.5</td>
</tr>
<tr>
<td>Guanidine isothiocyanate</td>
<td>No data available</td>
<td>No data available</td>
<td>No data available</td>
<td>No data available</td>
<td>No data available</td>
</tr>
<tr>
<td>Ammonium thiocyanate</td>
<td>No data available</td>
<td>No data available</td>
<td>No data available</td>
<td>No data available</td>
<td>No data available</td>
</tr>
</tbody>
</table>

Persistence and degradability
No information available.

Bioaccumulative potential
No information available.

Results of PBT and vPvB assessment
No information available.

Other adverse effects
No information available.
SECTION 13: Disposal considerations

Waste treatment methods
The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in accordance to approved disposal technique. Disposal of this product, its solutions or any by-products, shall comply with the requirements of all applicable local, regional or national/federal regulations.

SECTION 14: Transport information

IATA / ADR / DOT-US / IMDG
Classified as dangerous in the meaning of transport regulations.

<table>
<thead>
<tr>
<th>UN number</th>
<th>1760</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN proper shipping name</td>
<td>Corrosive liquid, n.o.s. (phenol - guanidine thiocyanate solution)</td>
</tr>
<tr>
<td>Transport hazard class(es)</td>
<td>8</td>
</tr>
<tr>
<td>Packing group</td>
<td>II</td>
</tr>
<tr>
<td>Environmental hazards</td>
<td>yes</td>
</tr>
<tr>
<td>Special precautions for user</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not Applicable.
SECTION 15: Regulatory information

<table>
<thead>
<tr>
<th>Component</th>
<th>US TSCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenol</td>
<td>Listed</td>
</tr>
<tr>
<td>108-95-2 (30-60)</td>
<td></td>
</tr>
<tr>
<td>Guanidine isothiocyanate</td>
<td>Listed</td>
</tr>
<tr>
<td>593-84-0 (15-40)</td>
<td></td>
</tr>
<tr>
<td>Ammonium thiocyanate</td>
<td>Listed</td>
</tr>
<tr>
<td>1762-95-4 (7-13)</td>
<td></td>
</tr>
</tbody>
</table>

US Federal Regulations

SARA 313
This product contains the following toxic chemical(s) subject to the notification requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986. This law requires certain manufacturers to report on annual emissions of specified chemicals and chemical categories. Please note that if you repackage, or otherwise redistribute, this product to industrial customers, a notice similar to this one should be sent to those customers:

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS-No</th>
<th>Weight %</th>
<th>SARA 313 - Threshold Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenol</td>
<td>108-95-2</td>
<td>30-60</td>
<td>1.0</td>
</tr>
<tr>
<td>Ammonium thiocyanate</td>
<td>1762-95-4</td>
<td>7-13</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61)
This product contains the following HAPs:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>Weight %</th>
<th>HAPS data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenol</td>
<td>108-95-2</td>
<td>30-60</td>
<td>Present (XCN where X=H or any other group where a formal dissociation may occur. For example KCN or Ca(CN)2)</td>
</tr>
<tr>
<td>Ammonium thiocyanate</td>
<td>1762-95-4</td>
<td>7-13</td>
<td>Present</td>
</tr>
</tbody>
</table>

US State Regulations

California Proposition 65
This product does not contain any Proposition 65 chemicals.

WHMIS Hazard Class
D1A - Very toxic materials
E - Corrosive material

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

SECTION 16: Other information

Reason for revision: SDS sections updated.
Revision number: 11
Revision date: 25-Apr-2017

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References
• ECHA: http://echa.europa.eu/
"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 the Company 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. THE INFORMATION IN THIS SDS DOES NOT CONSTITUTE A WARRENTY, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE"

End of Safety Data Sheet