


## Material Safety Data Sheet (MSDS)

### 1. IDENTIFICATION

Product Identification	
Product Name	T4 RNA ligase1
Item Number	TRL-BE101-B1/TRL-BE101-C1
SDS Number	W000231007
Relevant identified uses of the substance or mixture and uses advised against	This product is not involved.
Company Identification	
Company Name	KactusBio Inc.
Address	1 Broadway, Cambridge MA, 02142
Telephone	(617) 665-7333
Email	support@kactusbio.us

### 2. HAZARDS IDENTIFICATION

GHS Label elements, including precautionary statements	
Classification of the substance or mixture	Eye irritation, Category 2 Skin erosion / irritation Category 2 Specific target organ toxicity in one exposure Category 3
Pictogram(s)	
Signal word	<b>Warning</b>
Dangerous ingredients marked on the label	EDTA,DTT
Hazard Statement	H315 Causes skin irritation. H302 Harmful if swallowed. H319 Causes severe eye irritation. H335 Causes respiratory irritation. H411 Toxic to aquatic life with long lasting effects.
Prevention	P264 Wash hands thoroughly after handling; P280 Wear protective gloves/protective clothing/eye protection/protective masks. P270 Do not eat, drink or smoke when using this product. P280 Wear protective gloves/protective clothing/eye protection/protective mask. P261 Avoid breathing dust/fume/gas/mist/vapours/spray. P273 Avoid release to the environment.
Response	P337+P313 If you still feel eye irritation, seek medical attention. P305+P351+P338 If in eyes, immediately rinse with water for several minutes. Remove contact lens if present and easy to do. Continue rinsing. P301+P312 IF SWALLOWED: Get medical help. P302+P352 IF ON SKIN: Wash with plenty of water. P337+P313 If you still feel eye irritation: seek medical attention/medical attention. P362+P364 Take off contaminated clothing and wash it before reuse.
Storage	None
Disposal	None
Additional Information	None

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

CAS No.	Chemical Name
77-86-1	Tris-HCL
7447-40-7	KCl
60-00-4	EDTA

3483-12-3	DTT
56-81-5	Glycerol
not	Recombinant proteins

#### 4. FIRST AID MEASURES

Description of first aid measures	
After inhalation	Remove from exposure and move to fresh air. Seek medical attention.
After skin contact	Take off immediately all contaminated clothing. Rinse skin with water/ shower.
After eye contact	Separate eyelids, rinse with running water or normal saline, and seek immediate medical attention.
After swallowing	Rinse your mouth with water. Do not induce vomiting. Seek medical attention.
Most important symptoms and effects, both acute and delayed	No data available
Indication of any immediate medical attention and special treatment needed	No data available

#### 5. FIREFIGHTING MEASURES

Extinguishing Media	
Suitable Extinguishing Media	Water Foam Carbon dioxide (CO <sub>2</sub> ) Dry powder.
Unsuitable Extinguishing Media	For this substance/mixture no limitations of extinguishing agents are given.
Hazards and Advice	
Special hazards arising from the substance or mixture	Development of hazardous combustion gases or vapours possible in the event of fire.
Advice for Firefighters	In the event of fire, wear self-contained breathing apparatus.

#### 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment, and emergency procedures	Do not breathe vapors, aerosols. Evacuate the danger area, observe emergency procedures, consult an expert.
Environmental precautions	Do not let product enter drains.
Methods of containment and removal of spilled chemicals and disposal materials used	As far as possible, collect the leaking liquid in a closed container, absorb it with sand, activated carbon or other inert materials, and transfer it to a safe place, and do not flush into the sewer.
Reference to other sections	For disposal see section 13.

#### 7. HANDLING AND STORAGE

Precautions for Safe Handling	
<ul style="list-style-type: none"> <li>▪ Prohibition of open flames</li> <li>▪ Operators should be specially trained and strictly abide by operating procedures</li> <li>▪ Operation and disposal should be carried out in a place with local ventilation or comprehensive ventilation facilities</li> <li>▪ Avoid eye and skin contact and avoid inhalation of vapors</li> <li>▪ When handling, it should be loaded and unloaded lightly to prevent damage to packaging and containers</li> <li>▪ Empty containers may leave harmful substances</li> <li>▪ Wash hands after use, and do not eat or drink in the workplace</li> </ul>	
Information on Fire and Explosion Prevention	
<ul style="list-style-type: none"> <li>▪ Keep away from fire and heat sources, smoking is strictly prohibited in the workplace</li> <li>▪ Use explosion-proof ventilation systems and equipment</li> <li>▪ Avoid contact with forbidden substances such as oxidants, and equip corresponding varieties and quantities of firefighting equipment and leakage emergency treatment equipment</li> </ul>	
Safe Storage Conditions such as Mixing Hazards	
Storage Precautions	Requirements for warehouses and containers: Store in a cool, ventilated warehouse. Keep container tightly sealed
More information about storage conditions	Separate from oxidants, metals, food

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

<b>Engineering Control Method</b>	
The work site is recommended to be separated from other work sites. Strengthen ventilation and provide safe showers and eyewash equipment.	
<b>Occupational Exposure Limits</b>	
There are no known nationally prescribed exposure limits.	
<b>Biological Limits</b>	
No further information is available.	
<b>Monitoring Methods</b>	
No further information is available.	
<b>Personal Protective Equipment</b>	
Respiratory protection	Ventilation, local exhaust ventilation, or respiratory protection
Hand protection	Thermal gloves, protective clothing
Eye/face protection	Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses.
Skin and body protection	Wear overalls that prevent the penetration of poisons

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Information about basic physical and chemical properties</b>	
Shape	Liquid
Color	Colorless
Smell	Odorless
Olfactory Threshold	No information
pH (at 25°C)	8.0
Melting Point	No information
Boiling Point	No information
Flash Point	No information
Flammability	No information
Decomposition Temperature	No information
Natural Temperature	No information
Danger of Explosion	No information
Explosion Limit	No information
Lower Explosion Limit	No information
Upper Explosion Limit	No information
Vapor Pressure	No information
Density (at 25°C)	No information
Relative Density	No information
Vapor Density	No information
Evaporation Rate	No information
Solubility	No information
Water	Soluble
N-octanol/water partition coefficient	No information
Viscosity	No information
Movement	No information
Kinematic	No information
<b>Additional Information</b>	
No other relevant information is available.	

## 10. STABILITY AND REACTIVITY

<b>Dangerous Reaction</b>	Stable if stored and used at normal ambient temperature.
<b>Stability</b>	No data on thermal decomposition/situations to avoid.
<b>Conditions to be avoided</b>	Electrostatic discharge, heat, moisture, etc.
<b>Forbidden substances</b>	Strong oxidants.
<b>Dangerous decomposition products</b>	No data.

## 11. TOXICOLOGICAL INFORMATION

<b>Information on Toxicological Effects</b>	
Acute Toxicity	No data available
Relevant LD/LC50 Values	CAS: 1185-53-1 Tris-HCL Mouth: LD50 - rat (female) - > 5 000 mg/kg bw Inhalation: No data available Transdermal: LD50 - rat (male/female) - > 5 000 mg/kg bw
	CAS: 56-81-5 Glycerol Mouth: LD50 Rat > 12.6 g/kg Inhalation: LC50 Rat > 570 mg/cu m/1hr Transdermal: No data available
	CAS: 60-00-4 EDTA Mouth: LD50 - rat (male/female) - 4 500 mg/kg bw Inhalation: LOAEC - rat (male) - ca. 30 mg/m <sup>3</sup> air Transdermal: No data available
	CAS: 7447-40-7 KCl Mouth: No data available Inhalation: No data available Transdermal: No data available
	CAS: 3483-12-3 DTT Mouth: No data available Inhalation: No data available Transdermal: No data available
	CAS: not Recombinant proteins Mouth: No data available Inhalation: No data available Transdermal: No data available
Major Irritating Effects	No information
Additional Data (on experimental toxicity)	No further information available
Subacute to Chronic Toxicity	No further information available
Further Information on Poisons	No further information available

## 12. ECOLOGICAL INFORMATION

<b>Ecotoxicity</b>	
Aquatic Toxicity	Harmful to the aquatic environment
<b>Persistence and Degradability</b>	
No data available	
<b>Bioconcentration or Bioaccumulation</b>	
No data available	
<b>Soil</b>	
Soil Mobility	No data
Effects of Ecotoxicity	No data available
<b>Evaluation Results of PBT (residue, bioconcentrate, toxic substances) and vPvB (high residue, high bioconcentration substances)</b>	
The PBT/vPvB assessment is not available as the chemical safety assessment is not required/carried out.	
PBT (residue, bioconcentrate, toxic)	N/A
<b>Other Side Effects</b>	
The evaporation of substances can reach the concentration of particulate pollution in the air.	

## 13. DISPOSAL CONSIDERATIONS

<b>Disposal Methods and Precautions</b>
Recycle as much as possible. If it cannot be recycled, use incineration method for disposal. This product shall not be disposed of by

discharging it to the sewer
<b>Recommendation</b>
Return the container to the manufacturer or dispose of it in accordance with national and local regulations.

#### 14. TRANSPORT INFORMATION

<b>UN Dangerous Goods Number (UN Number), ADR, ADN, IMDG, IATA</b>	Void
<b>UN Appropriate Shipping Names ADR, ADN, IMDG, IATA</b>	Void
<b>UN Transport Hazard Classification ADR, ADN, IMDG, IATA</b>	Void
<b>Packaging Categories ADR, IMDG, IATA</b>	Void
<b>Harm to the Environment Marine Pollutants</b>	Void
<b>Special User Precautions</b>	N/A
<b>Annex 2 of MARPOL73/78 (Pact for the Prevention of Marine Pollution Caused by Ships) and bulk shipments under IBCCode (International Cargo Code)</b>	No provision is made
<b>Transportation/Additional Information</b>	No provision is made
<b>UN "Standard Specification"</b>	No provision is made

#### 15. REGULATORY INFORMATION

<b>Law of the People's Republic of China on the Prevention of Occupational Diseases</b>	
Classification of occupational disease hazard factors (2015)	Not included
<b>Regulations on the Safety Management of Hazardous Chemicals</b>	
Dangerous Goods Chemical Catalogue (2015)	Not included
List of Explosive Hazardous Chemicals (2017)	Not included
<b>List of Hazardous Chemicals under Key Regulation</b>	
The first and second batches of key regulated hazardous chemicals list	Not included
<b>Measures for Registration of Environmental Management of Hazardous Chemicals (Trial)</b>	
Catalogue of hazardous chemicals for key environmental management	Not included
<b>Regulations on the Administration of Narcotic Drugs and Psychotropic Substances</b>	
List of varieties of narcotic drugs	Not included
List of psychotropic drug varieties	Not included
<b>Environmental Management of New Chemical Substances</b>	
List of Existing Chemical Substances in China (2013)	Listed

#### 16. OTHER INFORMATION

The above information is based on the data and information currently available, but all values (content, physical and chemical property data, etc.) are not guaranteed, and all chemical substances may have unforeseen hazards, and the above records do not guarantee that all hazards are covered, so care should be taken when using.