Safety Data Sheet

Safety Data Sheet according to Regulation (EC) No. 1907/2006 (REACH)
Classification according to Regulation (EC) No. 1272/2008 [CLP]

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

Product identifier

Product code	22400089
Product name	RPMI 1640 (1X), liquid
Chemical Name	Not Applicable
REACH registration number	No registration number is given yet for this substance / substances in this mixture since the annual import quantity is less than one tonnage per annum or the transition period for its registration according to Article 23 of REACH has not yet expired.

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	For in vitro diagnostic use
Use Description Code	SU22 - Professional uses: Public domain (administration, education, entertainment, services, craftsmen), PROC15 - Use as laboratory reagent, PC21 - Laboratory chemicals, SU20 - Health services
Uses advised against	Not for consumer use.

Details of the supplier of the safety data sheet

Manufacturer / Supplier

LIFE TECHNOLOGIES EUROPE BV
KWARTSWEG 2
2665 NN BLEISWIJK
NETHERLANDS
31-(0)180 392 400
Email: MSDS@lifetech.com

Life Technologies Limited
3 Fountain Drive
Inchinnan Business Park
Paisley
PA4 9RF, UK
+44 (0)141 814 6100

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 Ireland (Dublin)	+(353)-19014670 (Greeting Language: English and Irish)
CHEMTREC UK (London)	+(44)-870-8200418 (Greeting Language: English)

SECTION 2: Hazards identification

Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Physical hazards
Not Hazardous

Health hazards
Not Hazardous

Environmental hazards
Not Hazardous

Additional information
Not Applicable

Label elements

Labelling according to Regulation (EC) No 1272/2008 [CLP]

Hazard pictograms
None

Signal Word
None

Hazard Statements
Not Applicable

EU Specific Hazard Statements
Not Applicable

Precautionary Statements

Prevention
Not Applicable

Response
Not Applicable

Storage
Not Applicable

Disposal
Not Applicable

Other hazards
This mixture does not contain any substances that are assessed to be a PBT or a vPvB

SECTION 3: Composition/information on ingredients

The product contains no substances which at their given concentration, are considered to be hazardous to health. We recommend handling all chemicals with caution.

SECTION 4: First aid measures

Description of first aid measures

Skin contact	Rinse skin with 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. Continue rinsing.
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
Not Applicable

Indication of any immediate medical attention and special treatment needed
None.

SECTION 5: Firefighting measures

Extinguishing media

Suitable extinguishing media	Water spray. Carbon dioxide (CO_2). Foam. Dry chemical.
Unsuitable extinguishing media	No information available.

Special hazards arising from the substance or mixture
Not known

Protective equipment and precautions for firefighters
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 information

Environmental precautions
No special environmental precautions required.

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 labelled containers.

Specific end use(s)
For in vitro diagnostic use.

SECTION 8: Exposure controls/personal protection

Control parameters

Exposure Limits Contains no substances with occupational exposure limit values.

Engineering Measures Ensure adequate ventilation, especially in confined areas.

Exposure controls

Personal protection 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
No special environmental precautions required.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance	liquid	
Odour	No data	
Odour Threshold	No data	
Molecular Weight	No data	
pH	6-8	
Melting point / melting range	**°C** No data	**°F** No data
Boiling point / boiling range	**°C** No data	**°F** No data
Flash point	**°C** No data	**°F** No data
Autoignition Temperature	**°C** No data	**°F** No data
Decomposition temperature	**°C** No data	**°F** No data
Evaporation rate	No data	
Flammability (solid, gas)	No data	
Upper explosion limit	No data	
Lower explosion limit	No data	
Vapour Pressure	No data	
Vapour density	No data	
Relative density	No data	
Specific gravity	No data	
Solubility	No data	
Partition coefficient: n-octanol/water	No data	
Viscosity	No data	
Explosive properties	No data	
Oxidising properties	No data	

Other information
No data.

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	No information available.
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

There is no evidence available indicating acute toxicity.

Principal Routes of Exposure

Skin corrosion/irritation	Data are conclusive but insufficient for classification
Serious eye damage/irritation	Data are conclusive but insufficient for classification
Respiratory or skin sensitisation	Data are conclusive but insufficient for classification
Specific target organ toxicity (STOT) – single exposure	Data are conclusive but insufficient for classification
Specific target organ toxicity (STOT) – repeated exposure	Data are conclusive but insufficient for classification
Carcinogenicity	Data are conclusive but insufficient for classification
Germ cell mutagenicity	Data are conclusive but insufficient for classification
Reproductive Toxicity	Data are conclusive but insufficient for classification
Aspiration Hazard	Data are conclusive but insufficient for classification

SECTION 12: Ecological information

Ecotoxicity
Contains no substances known to be hazardous to the environment or not degradable in waste water treatment plants.

Persistence and degradability	No information available.
Bioaccumulative potential	No information available.

Results of PBT and vPvB assessment
This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

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 according to approved disposal technique. Disposal of this product, its solutions or of 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
Not regulated in the meaning of transport regulations

UN number	Not Applicable
UN proper shipping name	Not Applicable
Transport hazard class(es)	Not Applicable
Packing group	Not Applicable

Environmental hazards
Not Applicable

Special precautions for user
Not Applicable

Transport in bulk according to Annex II of MARPOL and the IBC Code
Not Applicable.

SECTION 15: Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture

Substances of Very High Concern
None.

Substance subject to authorisation per REACH Annex XIV
None

Restricted substances under EC 1907/2006, Annex XVII
None.

Substances listed under Annex I of Regulation (EC) No 689/2008
None.

Restricted substances under Annex V of Regulation (EC) No 689/2008
None.

Substances under Regulation (EC) No 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC
None.

German Water hazard classes (Wassergefährdungsklassen)
Not classified.

Other International Inventories
No information available

Chemical safety assessment
No Chemical safety assessment has been carried out.

SECTION 16: Other information

Reason for revision	Update according to Commission Regulation (EU) No 830/2015
Revision number	3
Revision date	27-Oct-2019

References
- ECHA: http://echa.europa.eu/
- TOXNET: http://toxnet.nlm.nih.gov/
- eChemPortal: http://www.echemportal.org/
- LOLI database: https://www.chemadvisor.com/loli-database

Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]:
Not classified

"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 WARRANTY, EXPRESSED OR IMPLIED,INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE"

RPMI 1640 Medium

For various human clinical samples

Pub. No. MAN0018935 **Rev.** 1.0

WARNING! Read the Safety Data Sheets (SDSs) and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves. Safety Data Sheets (SDSs) are available from **thermofisher.com/support**.

Intended Use

For *in vitro* diagnostic use

The isolation of human viruses from clinical samples using cell culture remains necessary because it is the only technique capable of providing a viable isolate that can be used for antiviral susceptibility testing. An additional advantage is that in contrast to most antigen and nucleic acid detection methods, viral culture allows detection of multiple viruses, not all of which may have been suspected at the time diagnostic culture was requested.

RPMI 1640 cell culture media products are for professional use. They are used in medical laboratories by personnel who have received specialized education and training with regard to procedures utilizing In Vitro Diagnostic products. IVD products of this type are not intended as sole determinant in a diagnostic situation. Test results are interpreted by a healthcare professional as part of the clinical management of a patient.

Principle and explanation of procedure

RPMI is a commonly used cell culture media for diagnostic virology (1, 2). RPMI 1640 Medium was originally developed to culture human leukemic cells in suspension and as a monolayer. Roswell Park Memorial Institute (RPMI) 1640 Medium has since been found suitable for a variety of mammalian cells, including HeLa, Jurkat, MCF-7, PC12, PBMC, astrocytes, and carcinomas.

RPMI 1640 Medium is unique from other media because it contains the reducing agent glutathione and high concentrations of vitamins. RPMI 1640 Medium contains biotin, vitamin B12, and PABA, which are not found in Eagle's Minimal Essential Medium or Dulbecco's Modified Eagle Medium. In addition, the vitamins inositol and choline are present in very high concentrations. RPMI 1640 Medium contains no proteins, lipids, or growth factors. Therefore, RPMI 1640 Medium requires supplementation, commonly with 10% Fetal Bovine Serum (FBS). RPMI 1640 Medium uses a sodium bicarbonate buffer system (2.0 g/L), and therefore requires a 5–10% CO_2 environment to maintain physiological pH.

Contents and storage

All quality control testing results are reported on lot-specific Certificate of Analysis available on our website: **thermofisher.com**.

Product	Cat. No.	Storage	Shelf life[1]
RPMI 1640 (1X) [+] L-Glutamine [-] Phenol Red	11835030[2] 11835055[2] 11835063[3]	2°C to 8°C Protect from light	12 months
RPMI Medium (1X) 1640 [+] L-Glutamine	11875085[4] 11875093[4] 11875101[2] 11875119[4] 11875127[2] 11875135[4] 11875168[2] 11875176[2]	2°C to 8°C Protect from light	12 months

CE IVD

For In Vitro Diagnostic Use.

ThermoFisher SCIENTIFIC

Product	Cat. No.	Storage	Shelf life[1]
RPMI Medium (1X) 1640 [-] L-Glutamine	21870076[4] 21870084[4] 21870092[4] 21870100[4]	2°C to 8°C Protect from light	24 months
RPMI 1640 W/GLUT (1X) (CE)	21875034[3] 21875042[3] 21875059[3]	2°C to 8°C Protect from light	12 months
RPMI 1640 (1X) [+] L-Glutamine [+] HEPES	22400071[2] 22400089[4] 22400097[2] 22400105[4] 22400121[2] 22400197[2]	2°C to 8°C Protect from light	12 months
RPMI 1640 W/O L-GLUTAMINE (CE)	31870017[3] 31870025[3]	2°C to 8°C Protect from light	12 months
RPMI 1640 W/O PHENOL RED	32404014[3]	2°C to 8°C Protect from light	12 months
RPMI 1640 W/25MMHEPES W/OL-GLUT	42401018[3] 42402016[3]	2°C to 8°C Protect from light	12 months
RPMI MEDIUM 1640 W/HEPES (CE)	52400017[3] 52400025[3]	2°C to 8°C Protect from light	12 months
RPMI 1640 W/GLUTAMAX-I (1X)	61870010[3] 61870036[2] 61870127[2] 61870143[2] 61870150[2]	2°C to 8°C Protect from light	12 months
RPMI 1640 W/HEPES W/GLUTAMAX-I	72400013[3] 72400021[3]	2°C to 8°C Protect from light	12 months
RPMI (1X) + GlutaMAX -I	72400047[2] 72400120[2] 72400146[2] 72400153[2]	2°C to 8°C Protect from light	12 months

[1] Shelf life is determined from Date of Manufacture. Do not use beyond the labelled expiration date.
[2] Manufacturer: Life Technologies Corporation | 3175 Staley Road | Grand Island, NY 14072
[3] Manufacturer: Life Technologies™ Ltd. | 3 Fountain Drive, Inchinnan Business Park | Paisley PA49RF, Scotland, United Kingdom |Tel: +44 (0)141 81416305
[4] Dual manufactured.

Precautions

Do not use the product if packaging, including bottles and vials, have been compromised and/or show evidence of microbial contamination, cloudy appearance, discoloration, drying, cracking, or other signs of deterioration.

CAUTION! Human samples are potentially biohazardous. Follow standard precautions for handling, storage and disposal.

WARNING! Do not use for injection or infusion! Please report any serious incidents in relation to the device to the manufacturer and the Competent Authority of the EU Member State in which the user and/or patient is established.

- Once opened, use RPMI 1640 Medium within 14 days for maximal growth performance.
- Avoid repeated warming/cooling and prolonged exposure to light.
- Do not use beyond labeled expiration date.
- All solutions that come into contact with clinical samples must be sterile. Always use proper aseptic techniques and work inside a laminar flow hood. Consult our **Gibco Cell Culture Basics** for aseptic handling.

Test protocol

There is no single type of cell culture that can support the growth of all medically relevant viruses. As such, virology laboratories must maintain several different cell culture types. The choice of cell line used for a specific specimen is determined by the information communicated from the ordering physician to the laboratory and by knowledge of the specimens usually isolated from a given specimen type.

Ready to-use commercial cell culture media undergoes strict quality control to ensure sterility, but may become contaminated while handling. Follow the below guidelines for sterile handling to avoid contamination.

- Always wipe your hand and work area with 70% ethanol.
- Wipe the outside of the containers, flasks, plates, and dishes with 70% ethanol before placing them in the cell culture hood.
- Avoid pouring media and reagents directly from bottles or flasks.
- Use sterile pipette tips and pipettes to work with liquids, and use each pipette tip only once to avoid cross-contamination. Do not unwrap sterile pipettes until they are ready to be used. Keep pipettes and tips within the clean work area.
- Do not talk while performing sterile procedures and perform your cell culture as rapidly as possible to minimize contamination.

Quality control

Standard evaluations for cell culture media are pH, osmolality, endotoxins and sterility testing for liquid products. All quality control testing results are reported on lot specific Certificate of Analysis available on our website: **thermofisher.com**.

Related products

Product	Source
Gentamicin 50 mg/mL	15750078
Gibco Amphoteracin B	15290018
Penicillin Streptomycin 10,000 U/mL	15140122
PBS, pH 7.4	10010031
Phytohemagglutinin, M form (PHA-M)	10576015
FBS	16000044

References

1. Winn, W. C., & Koneman, E. W. (2006). Koneman's color atlas and textbook of diagnostic microbiology (6th ed.). Philadelphia: Lippincott Williams & Wilkins.
2. WHO Guidelines on the Establishment of Virology Laboratories in Developing Countries, 2008.
3. Griffith, B P. "Principles of laboratory isolation and identification of the human immunodeficiency virus (HIV)" Yale journal of biology and medicine vol. 60,6 (1987): 575-87.
4. Krowicka, Halina et al. "Use of tissue culture cell lines to evaluate HIV antiviral resistance" AIDS research and human retroviruses vol. 24,7 (2008): 957-67.

Labeling symbols

The symbols present on the product label are explained in the following table.

	MANUFACTURER		USE BY
IVD	IN VITRO DIAGNOSTIC MEDICAL DEVICE		CONSULT INSTRUCTIONS FOR USE
REF	CATALOG NUMBER		CAUTION, CONSULT ACCOMPANYING DOCUMENTS
LOT	BATCH CODE		UPPER AND LOWER LIMITS OF TEMPERATURE
STERILE A	Sterilized using aseptic processing technique		PROTECT FROM LIGHT
CE	European Mark of Conformity	EC REP	AUTHORISED REPRESENTATIVE IN THE EUROPEAN COMMUNITY

Limited product warranty

Life Technologies Corporation and/or its affiliate(s) warrant their products as set forth in the Life Technologies' General Terms and Conditions of Sale at **www.thermofisher.com/us/en/home/global/terms-and-conditions.html**. If you have any questions, please contact Life Technologies at **www.thermofisher.com/support**.

Manufacturer:
Life Technologies Corporation |
3175 Staley Road |
Grand Island, NY 14072

Manufacturer:
Life Technologies™ Ltd. |
3 Fountain Drive, Inchinnan Business Park |
Paisley PA49RF, Scotland, United Kingdom |
Tel: +44 (0)141 81416305

Manufacturer:
Dual manufactured products

EC REP
European Regulatory Affairs
Life Technologies Europe B.V.
Kwartsweg 2, 2665 NN Bleiswijk
The Netherlands
Tel: +31 (0) 10 714 5000

The information in this guide is subject to change without notice.

DISCLAIMER: TO THE EXTENT ALLOWED BY LAW, THERMO FISHER SCIENTIFIC INC. AND/OR ITS AFFILIATE(S) WILL NOT BE LIABLE FOR SPECIAL, INCIDENTAL, INDIRECT, PUNITIVE, MULTIPLE, OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH OR ARISING FROM THIS DOCUMENT, INCLUDING YOUR USE OF IT.

Revision history: Pub. No. MAN0018935

Revision	Date	Description
1.0	12 November 2019	New document

Important Licensing Information: These products may be covered by one or more Limited Use Label Licenses. By use of these products, you accept the terms and conditions of all applicable Limited Use Label Licenses.

Safety Data Sheet

(In accordance with COMMISSION REGULATION (EU) No 830/2015)

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

Product identifier

Product code	15250061
Product name	TRYPAN BLUE STAIN
Chemical Name	Not Applicable
REACH registration number	No registration number is given yet for this substance / substances in this mixture since the annual import quantity is less than one tonnage per annum or the transition period for its registration according to Article 23 of REACH has not yet expired.

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	For research use only
Use Description Code	SU22 - Professional uses: Public domain (administration, education, entertainment, services, craftsmen), PROC15 - Use as laboratory reagent, PC21 - Laboratory chemicals, SU24 - Scientific research and development
Uses advised against	Not for consumer use.

Details of the supplier of the safety data sheet

Manufacturer/Supplier

LIFE TECHNOLOGIES EUROPE BV
KWARTSWEG 2
2665 NN BLEISWIJK
NETHERLANDS
31-(0)180 392 400
Email: MSDS@lifetech.com

Life Technologies Limited
3 Fountain Drive
Inchinnan Business Park
Paisley
PA4 9RF, UK
+44 (0)141 814 6100

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 Ireland (Dublin)	+(353)-19014670 (Greeting Language: English and Irish)
CHEMTREC UK (London)	+(44)-870-8200418 (Greeting Language: English)

SECTION 2: Hazards identification

Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 [CLP]

Physical hazards
Not Hazardous

Health hazards

Carcinogenicity	Category 1
Reproductive Toxicity	Category 2

Environmental hazards
Not Hazardous

Additional information
Full text of R-phrases: see section 16

Label elements

Labelling according to Regulation (EC) No 1272/2008 [CLP]

Hazard pictograms

Signal Word
Danger

Hazard Statements
H350 - May cause cancer
H361 - Suspected of damaging fertility or the unborn child

Precautionary Statements

Prevention
P201 - Obtain special instructions before use
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P202 - Do not handle until all safety precautions have been read and understood

Response
P308 + P313 - IF exposed or concerned: Get medical advice/attention

Storage
Not Applicable

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

Other hazards

Not Applicable

SECTION 3: Composition/information on ingredients

Component	CAS No	EINECS-No.	Weight-%	REACH registration number	Classification according to Regulation (EC) No 1272/2008 [CLP]
2,7-Naphthalenedisulfonic acid, 3,3-[(3,3-dimethyl[1,1-biphenyl]-4,4-diyl)bis(azo)]bis[5-amino-4-hydroxy-, tetrasodium salt 72-57-1 (0.1-1)	72-57-1	200-786-7	0.1-1	-	Carc. 1 - H350 Repro 2 - H361

SECTION 4: First aid measures

Description of first aid measures

Skin contact Wash off immediately with plenty of water for at least 15 minutes. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Immediate medical attention is required.

Eye contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Immediate medical attention is required.

Ingestion Never give anything by mouth to an unconscious person. Do not induce vomiting without medical advice. If swallowed, rinse mouth with water (only if the person is conscious). Risk of serious damage to the lungs (by aspiration). Get medical attention if symptoms occur.

Inhalation Remove to fresh air. If not breathing, give artificial respiration. If symptoms persist, call a doctor.

Notes to Physician Treat symptomatically.

Most important symptoms and effects, both acute and delayed
H350 - May cause cancer H361 - Suspected of damaging fertility or the unborn child

Indication of any immediate medical attention and special treatment needed
Wear protective gloves/protective clothing and eye/face protection. IF exposed or concerned: Get medical advice/attention.

SECTION 5: Firefighting measures

Extinguishing media

Suitable extinguishing media Water spray. Carbon dioxide (CO2). Foam. Dry chemical.

Unsuitable extinguishing media No information available.

Special hazards arising from the substance or mixture
Not known.

Advice for fire-fighters
Wear self-contained breathing apparatus and protective suit.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures
Ensure adequate ventilation
Avoid contact with skin, eyes or clothing
Use personal protection equipment
See Section 8 for more detail.

Environmental precautions
Avoid discharge into drains and waterways whenever possible.

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
Always wear recommended Personal Protective Equipment. Wash hands before breaks and immediately after handling the product. Do not get in eyes, on skin, or on clothing. Avoid breathing vapours or mists. If during normal use the material presents a respiratory hazard, use adequate ventilation and/or wear appropriate respirator. See Section 8 for more detail.

Conditions for safe storage, including any incompatibilities
Keep in a dry, cool and well-ventilated place. Keep in properly labelled containers. Store in accordance with local regulations.

Specific end use(s)
For research use only.

SECTION 8: Exposure controls/personal protection

Control parameters

Chemical Name	EU OEL (TWA)	EU OEL (STEL)	EU Skin Notation
2,7-Naphthalenedisulfonic acid, 3,3-[(3,3-dimethyl[1,1-biphenyl]-4,4-diyl)bis(azo)]bis[5-amino-4-hydroxy-, tetrasodium salt 72-57-1	None	None	None

Chemical Name	Austria	Belgium (TWA)	Denmark (TWA)	Finland OEL (TWA)
2,7-Naphthalenedisulfonic acid, 3,3-[(3,3-dimethyl[1,1-biphenyl]-4,4-diyl)bis(azo)]bis[5-amino-4-hydroxy-, tetrasodium salt 72-57-1	None	None	None	None

Chemical Name	France OEL (VME)	Germany OEL (TWA)	Ireland (TWA)	Italy OEL (TWA)
2,7-Naphthalenedisulfonic acid, 3,3-[(3,3-dimethyl[1,1-biphenyl]-4,4-diyl)bis(azo)]bis[5-amino-4-hydroxy-, tetrasodium salt 72-57-1	None	None	None	None

Chemical Name	Sweden - Occupational Exposure Limits - TLVs (LLVs)	Netherlands OEL (MAC)	Spain OEL (TWA)	United Kingdom
2,7-Naphthalenedisulfonic acid, 3,3-[(3,3-dimethyl[1,1-biphenyl]-4,4-diyl)bis(azo)]bis[5-amino-4-hydroxy-, tetrasodium salt 72-57-1	None	None	None	None

Chemical Name	European Union	France OEL (VME)	Germany OEL (TWA)
2,7-Naphthalenedisulfonic acid, 3,3-[(3,3-dimethyl[1,1-biphenyl]-4,4-diyl)bis(azo)]bis[5-amino-4-hydroxy-, tetrasodium salt 72-57-1	None	None	None

Chemical Name	Italy OEL (TWA)	Portugal	Netherlands OEL (MAC)	Finland OEL (TWA)
2,7-Naphthalenedisulfonic acid, 3,3-[(3,3-dimethyl[1,1-biphenyl]-4,4-diyl)bis(azo)]bis[5-amino-4-hydroxy-, tetrasodium salt 72-57-1	None	None	None	None

Chemical Name	Austria	Denmark	Poland	Switzerland
2,7-Naphthalenedisulfonic acid, 3,3-[(3,3-dimethyl[1,1-biphenyl]-4,4-diyl)bis(azo)]bis[5-amino-4-hydroxy-, tetrasodium salt 72-57-1	None	None	None	None

Chemical Name	Ireland	Norway	Lithuania OEL (TWA)	Spain OEL (TWA)
2,7-Naphthalenedisulfonic	None	None	None	None

acid, 3,3-[(3,3-dimethyl[1,1-biphenyl]-4,4-diyl)bis(azo)]bis[5-amino-4-hydroxy-, tetrasodium salt 72-57-1				

Engineering measures Ensure adequate ventilation, especially in confined areas.

Exposure controls

Personal protection 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 laboratory coat for body protection.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

Environmental exposure controls
No special environmental precautions required.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance	liquid	
Odour	Mixture has not been tested	
Odour Threshold	Mixture has not been tested	
pH	Mixture has not been tested	
Melting point / melting range	**°C** Mixture has not been tested	**°F** Mixture has not been tested
Boiling point / boiling range	**°C** Mixture has not been tested	**°F** Mixture has not been tested
Flash point	**°C** Mixture has not been tested	**°F** Mixture has not been tested
Autoignition Temperature	**°C** Mixture has not been tested	**°F** Mixture has not been tested
Decomposition temperature	**°C** Mixture has not been tested	**°F** Mixture has not been tested
Evaporation rate	No data	
Flammability (solid, gas)	Not Applicable	
Upper explosion limit	Mixture has not been tested	
Lower explosion limit	Mixture has not been tested	
Vapour Pressure	Mixture has not been tested	
Relative density	Mixture has not been tested	
Specific gravity	No data	
Solubility	Mixture has not been tested	
Partition coefficient: n-octanol/water	No data	
Viscosity	Mixture has not been tested	
Explosive properties	Mixture has not been tested	
Oxidising properties	Mixture has not been tested	

Other information
No data.

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 None known.

Incompatible materials No dangerous reaction known under conditions of normal use.

Hazardous decomposition products No known hazardous decomposition products.

SECTION 11: Toxicological information

Information on toxicological effects

Chemical Name	LD50 (oral,rat/mouse)	LD50 (dermal,rat/rabbit)	LC50 (inhalation,rat/mouse)
2,7-Naphthalenedisulfonic acid, 3,3-[(3,3-dimethyl[1,1-biphenyl]-4,4-diyl)bis(azo)]bis[5-amino-4-hydroxy-, tetrasodium salt	= 6200 mg/kg (Rat)	No data available	No data available

Principal Routes of Exposure,

Skin corrosion/irritation Conclusive but not sufficient for classification

Serious eye damage/irritation Conclusive but not sufficient for classification

Respiratory or skin sensitisation Conclusive but not sufficient for classification

Specific target organ toxicity (STOT) – single exposure Conclusive but not sufficient for classification

Specific target organ toxicity (STOT) – repeated exposure Conclusive but not sufficient for classification

Carcinogenicity Contains a known or suspected carcinogen

Germ cell mutagenicity Conclusive but not sufficient for classification

Reproductive Toxicity May cause adverse reproductive effects - such as birth defect, miscarriages, or infertility

Aspiration Hazard Conclusive but not sufficient for classification

SECTION 12: Ecological information

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

Chemical Name	Freshwater Algae Data	Water Flea Data	Freshwater Fish Species Data	Microtox Data	log Pow
2,7-Naphthalenedisulfonic acid, 3,3-[(3,3-dimethyl[1,1-biphenyl]-4,4-diyl)bis(azo)]bis[5-amino-4-hydroxy-, tetrasodium salt	No data available	No data available	No data available	No data available	No data available

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 according to approved disposal technique. Disposal of this product, its solutions or of 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
Not regulated in the meaning of transport regulations

UN number	Not Applicable
UN proper shipping name	Not Applicable
Transport hazard class(es)	Not Applicable
Packing group	Not Applicable

Environmental hazards
Not Applicable

Special precautions for user
Not Applicable

Transport in bulk according to Annex II of MARPOL and the IBC Code
Not Applicable.

SECTION 15: Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture

Substances of Very High Concern
None.

EU REACH (1907/2006) - Annex XIV - Substances Subject to Authorization
None

Restricted substances under EC 1907/2006, Annex XVII
None.

Substances listed under Annex I of Regulation (EC) No 689/2008
None.

Restricted substances under Annex V of Regulation (EC) No 689/2008
None.

Substances under Regulation (EC) No 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC
None.

German Water hazard classes (Wassergefährdungsklassen)

Chemical Name	Weight-%	Germany - Water Classification - Substances According to AwSV Classified By or Based on the VwVwS
2,7-Naphthalenedisulfonic acid, 3,3-[(3,3-dimethyl[1,1-biphenyl]-4,4-diyl)bis(azo)] bis[5-amino-4-hydroxy-, tetrasodium salt	0.1-1	hazard class 3 - highly hazardous to water

Other International Inventories

Chemical Name	EINECS (European Union)	ELINCS (European List of Notified Chemical Substances)	ENCS (Japan)	PICCS (Philippines)
2,7-Naphthalenedisulfonic acid, 3,3-[(3,3-dimethyl[1,1-biphenyl]-4,4-diyl)bis(azo)]bis[5-amino-4-hydroxy-, tetrasodium salt	Listed	-	-	Listed

Chemical Name	AICS (Australia)	South Korea (KECL)	Canada (DSL)	NDSL
2,7-Naphthalenedisulfonic acid, 3,3-[(3,3-dimethyl[1,1-biphenyl]-4,4-diyl)bis(azo)]bis[5-amino-4-hydroxy-, tetrasodium salt	Listed	Listed	Listed	-

Chemical safety assessment
No Chemical safety assessment has been carried out.

SECTION 16: Other information

Reason for revision	Update according to Commission Regulation (EU) No 830/2015
Revision number	8
Revision date	28-Aug-2018

References

- ECHA: http://echa.europa.eu/
- TOXNET: http://toxnet.nlm.nih.gov/
- eChemPortal: http://www.echemportal.org/
- LOLI database: https://www.chemadvisor.com/loli-database

Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]:

Carcinogenicity	Category 1	Calculation method
Reproductive Toxicity	Category 2	Calculation method

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SAFETY DATA SHEET

(In accordance with COMMISSION REGULATION (EU) No 830/2015)

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

Product identifier

Product code	EO0491
Product name	Proteinase K
Chemical Name	Not Applicable
REACH registration number	No registration number is given yet for this substance / substances in this mixture since the annual import quantity is less than one tonnage per annum or the transition period for its registration according to Article 23 of REACH has not yet expired.

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	For research use only
Use Description Code	SU22 - Public domain (administration, education, entertainment, services, craftsmen), PROC15 - Use as a laboratory reagent, PC21 - Laboratory chemicals, SU24 - Scientific research and development
Uses advised against	Not for consumer use.

Details of the supplier of the safety data sheet

Manufacturer/Supplier
Thermo Fisher Scientific Baltics UAB
V.Graiciuno 8
LT-02241 Vilnius
Lithuania
Tel.: +370 5 2602131
Fax.: +370 5 2602142

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 Ireland (Dublin)	+(353)-19014670 (Greeting Language: English and Irish)
CHEMTREC UK (London)	+(44)-870-8200418 (Greeting Language: English)

SECTION 2: Hazards identification

Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 [CLP]

Physical hazards
Not classified

Health hazards

respiratory sensitiser	Category 1

Environmental Hazards
Not classified

Additional information
Not Applicable

Label elements

Labelling according to Regulation (EC) No 1272/2008 [CLP]

Hazard pictograms

Signal word
Danger

Hazard Statements
H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled

EU Specific Hazard Statements
Not Applicable

Precautionary Statements

Prevention
P261 - Avoid breathing dust/fume/gas/mist/vapours/spray
P284 - In case of inadequate ventilation wear respiratory protection

Response
P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
P342 + P311 - If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician

Storage
Not Applicable

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

Other hazards

Not Applicable

SECTION 3: Composition/information on ingredients

Component	CAS-No.	EINECS-No.	Weight percent	REACH registration number	Classification according to Regulation (EC) No 1272/2008 [CLP]
Proteinase, tritirachium album serine 39450-01-6 (1 - 5)	39450-01-6	254-457-8	1 - 5	-	Skin Irrit. 2 - H315 Eye Irrit. 2 - H319 Resp. Sens. 1 - H334
Glycerin 56-81-5 (40 - 70)	56-81-5	200-289-5	40 - 70	01-2119471987-18-XXXX	-

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

Indication of any immediate medical attention and special treatment needed
None.

SECTION 5: Firefighting measures

Extinguishing media

Suitable Extinguishing Media Water spray. Carbon dioxide (CO2). Foam. Dry chemical.

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
No special environmental precautions required.

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 labelled containers.

Specific end use(s)
For research use only.

SECTION 8: Exposure controls/personal protection

Control parameters

Chemical Name	EU OEL (TWA)	EU OEL (STEL)	EU Skin Notation
Proteinase, tritirachium album serine 39450-01-6	None	None	None
Glycerin 56-81-5	None	None	None

Chemical Name	Austria	Belgium (TWA)	Denmark (TWA)	Finland OEL (TWA)
Proteinase, tritirachium album serine 39450-01-6	None	None	None	None
Glycerin 56-81-5	None	10 mg/m^3	None	None

Chemical Name	France OEL (VME)	Germany OEL (TWA)	Ireland (TWA)	Italy OEL (TWA)
Proteinase, tritirachium album serine 39450-01-6	None	None	None	None
Glycerin 56-81-5	10 mg/m^3	200 mg/m^3 exposure factor 2	10 mg/m^3	None

Chemical Name	Sweden - Occupational Exposure Limits - TLVs (LLVs)	Netherlands OEL (MAC)	Spain OEL (TWA)	United Kingdom
Proteinase, tritirachium album serine 39450-01-6	None	None	None	None
Glycerin 56-81-5	None	None	10 mg/m^3	10 mg/m^3 TWA (mist)

Chemical Name	European Union	France OEL (VME)	Germany OEL (TWA)
Proteinase, tritirachium album serine 39450-01-6	None	None	None
Glycerin 56-81-5	None	10 mg/m^3	200 mg/m^3 exposure factor 2

Chemical Name	Italy OEL (TWA)	Portugal	Netherlands OEL (MAC)	Finland OEL (TWA)
Proteinase, tritirachium album serine 39450-01-6	None	None	None	None
Glycerin 56-81-5	None	None	None	None

Chemical Name	Austria	Denmark	Poland	Switzerland
Proteinase, tritirachium album serine 39450-01-6	None	None	None	None
Glycerin 56-81-5	None	None	None	None

Chemical Name	Ireland	Norway	Lithuania OEL (TWA)	Spain OEL (TWA)
Proteinase, tritirachium album serine 39450-01-6	None	None	None	None
Glycerin 56-81-5	None	None	None	10 mg/m^3

Engineering measures Ensure adequate ventilation, especially in confined areas.

Exposure controls

Personal protection 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
No special environmental precautions required.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance	Colourless, Liquid	
Odour	Odourless	
Melting point / melting range	**°C** Mixture has not been tested	**°F** Mixture has not been tested
Boiling point / boiling range	**°C** Mixture has not been tested	**°F** Mixture has not been tested
Flash point	**°C** Mixture has not been tested	**°F** Mixture has not been tested
Autoignition temperature	**°C** Mixture has not been tested	**°F** Mixture has not been tested
Decomposition temperature	**°C** Mixture has not been tested	**°F** Mixture has not been tested
Evaporation rate	No data available	
Flammability (solid, gas)	No data available	
Upper explosion limit	Mixture has not been tested	
Lower explosion limit	Mixture has not been tested	
Vapour Pressure	Mixture has not been tested	
Relative density	Mixture has not been tested	
Specific gravity	No data available	
Solubility	no data available	
Partition coefficient: n-octanol/water	No data available	
Explosive properties	Mixture has not been tested	

OTHER INFORMATION No data available

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	None under normal processing.
Incompatible Materials	No dangerous reaction known under conditions of normal use.
Hazardous decomposition products	None under normal use conditions.

SECTION 11: Toxicological information

Information on toxicological effects

Chemical Name	LD50 (oral,rat/mouse)	LD50 (dermal,rat/rabbit)	LC50 (inhalation,rat/mouse)
Proteinase, tritirachium album serine	No data available	No data available	No data available
Glycerin	= 12600 mg/kg Oral	No data available	>570mg/m³(Rat)

Principal Routes of Exposure, Potential health effects

Irritation Conclusive but not sufficient for classification

Corrosivity Conclusive but not sufficient for classification

Sensitisation May cause sensitisation by inhalation and skin contact

STOT - Single Exposure Conclusive but not sufficient for classification

STOT - Repeated Exposure Conclusive but not sufficient for classification

Carcinogenicity Conclusive but not sufficient for classification

Mutagenicity Conclusive but not sufficient for classification

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.

Chemical Name	Freshwater Algae Data	Water Flea Data	Freshwater Fish Species Data	Microtox Data	log Pow
Proteinase, tritirachium album serine	No data available	No data available	No data available	No data available	No data available
Glycerin	No data available	Daphnia magna EC50>500 mg/L (24 h)	No data available	No data available	logPow-1.76

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 according to approved disposal technique. Disposal of this product, its solutions or of 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
Not classified as dangerous in the meaning of transport regulations.

UN Number	Not Applicable
UN proper shipping name	Not Applicable
Transport hazard class(es)	Not Applicable
Packing group	Not Applicable
Environmental Hazards	Not Applicable
Special precautions for user	Not Applicable

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not Applicable.

SECTION 15: Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture

Substances of Very High Concern
None.

Restricted substances under EC 1907/2006, Annex XVII
None.

Substances listed under Annex I of Regulation (EC) No 689/2008
None.

Restricted substances under Annex V of Regulation (EC) No 689/2008
None.

Substances under Regulation (EC) No 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC
None.

German Water hazard classes (Wassergefährdungsklassen)

Chemical Name	Weight percent	Germany - Water Classification (VwVwS) - Annex 1	Germany - Water Classification (VwVwS) - Annex 2 - Water Hazard Classes	Germany - Water Classification (VwVwS) - Annex 3
Glycerin	40 - 70		hazard class 1 - low hazard to waters	

Other International Inventories

Chemical Name	EINECS (European Union)	ELINCS (European List of Notified Chemical Substances)	ENCS (Japan)	PICCS (Philippines)
Proteinase, tritirachium album serine	Listed	-	-	-
Glycerin	Listed	-	Listed	Listed

Chemical Name	AICS (Australia)	South Korea (KECL)	Canada (DSL)	NDSL
Proteinase, tritirachium album serine	-	-	-	-
Glycerin	Listed	Listed	Listed	-

Chemical Safety Assessment
No Chemical safety assessment has been carried out.

SECTION 16: Other information

Reason for revision Update according to Commission Regulation (EU) No 453/2010.
Revision number 4
Revision date 08-Sep-2017

References
• ECHA: http://echa.europa.eu/
• TOXNET: http://toxnet.nlm.nih.gov/
• eChemPortal: http://www.echemportal.org/
• LOLI database: https://www.chemadvisor.com/loli-database

Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]:

respiratory sensitiser	Category 1	Calculation method

"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 WARRANTY, EXPRESSED OR IMPLIED,INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE"

Proteinase K (recombinant), PCR grade

Catalog Number EO0491, EO0492

Pub. No. MAN0012880 **Rev.** D.00

WARNING! Read the Safety Data Sheets (SDSs) and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves. Safety Data Sheets (SDSs) are available from **thermofisher.com/support.**

Product description

Proteinase K is an endolytic protease that cleaves peptide bonds at the carboxylic sides of aliphatic, aromatic or hydrophobic amino acids. The Proteinase K is classified as a serine protease (1). The smallest peptide to be hydrolyzed by this enzyme is a tetrapeptide.

Contents and storage

Cat. No.	Contents	Source	Molecular Weight	Amount	Storage
EO0491	Proteinase K (recombinant), PCR grade	Pichia pastoris cells with a cloned gene from *Tritirachium album*	28.9 kDa monomer (6)	1 mL, ≥ 600 U/mL (~20 mg/mL)	-25 °C to -15 °C
EO0492				5 x 1 mL, ≥ 600 U/mL (~20 mg/mL)	

Applications

- Isolation of genomic DNA from mouse tail.
- Isolation of genomic DNA from cultured cells.
- Removal of DNases and RNases when isolating DNA and RNA from tissues or cell lines (2, 3).
- Determination of enzyme localization (4).
- Improving cloning efficiency of PCR products (5).

Definition of Activity Unit

One unit of the enzyme liberates Folin-positive amino acids and peptides corresponding to 1 µmol tyrosine in 1 min at 37 °C using denatured hemoglobin as substrate. Enzyme activity is assayed in the following mixture: 0.08 M potassium phosphate (pH 7.5), 5 M urea, 4 mM NaCl, 3 mM $CaCl_2$ and 16.7 mg/mL hemoglobin.

Storage Buffer

The enzyme is supplied in: 10 mM Tris-HCl (pH 7.5), containing calcium acetate and 50 % (v/v) glycerol.

Inhibition and Inactivation

- Phenylmethylsulfonyl fluoride and diisopropyl phosphorofluoridate completely inhibit the enzyme (1).
- Proteinase K is not inactivated by metal chelators, by thiol-reactive reagents or by specific trypsin and chymotrypsin inhibitors.

Note

- The recommended working concentration for Proteinase K is 0.05-1 mg/mL. The activity of the enzyme is stimulated by 0.2-1 % SDS or by 1-4 M urea (3).
- Ca^{2+} protects Proteinase K against autolysis, increases the thermal stability and has a regulatory function for the substrate binding site of Proteinase K (7).
- Stable over a wide pH range: 4.0-12.5, optimum pH 7.5-8.0 (8).

References

1. Ebeling, W., et al., Proteinase K from Tritirachium album Limber, Eur. J. Biochem., 47, 91-97, 1974.
2. Wiegers, U., Hilz, H., A new method using 'proteinase K' to prevent mRNA degradation during isolation from HeLa cells, Biochem. and Biophys. Res. Commun., 44, 513-519, 1971.
3. Hilz, H., et al., Stimulation of proteinase K action by denaturing agents: application to the isolation of nucleic acids and the degradation of "masked" proteins, Eur. J. Biochem., 56, 103-108, 1975.
4. Brdiczka, D. and Krebs, W., Localization of enzymes by means of proteases, Biochim. Biophys. Acta, 297, 203-212, 1973.
5. Crowe, J.S., et al., Improved cloning efficiency of polymerase chain reaction (PCR) products after proteinase K digestion, Nucleic Acids Res., 19,184, 1991.
6. Jany, K.D., et al., Amino acid sequence of Proteinase K from mold Tritirachium album Limber Proteinase K – a subtilisin related enzyme with disulfide bonds, FEBS Lett., 199, 139-144, 1986.
7. Bajorath, J., et al., The enzymatic activity of proteinase K is controlled by calcium, Eur. J. Biochem., 176, 441-447, 1988.
8. Ardelt, W., Laskowski, M.Jr., Turkey ovomucoid third domain inhibits eight different serine proteinases of varied specificity of the same ...Leu18-Glu19... reactive site, Biochemistry, 24, 5313-5320, 1985.

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