

# SAFETY DATA SHEET

Singapore

## Section 1. Identification

GHS product identifier

**Protein precipitation buffer type 1; part of 'triplePrep™ Kit, 50 reactions'**

Catalogue Number

28942544



Component Number

28932442

Other means of identification Not available.

Product type Liquid.

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

#### Identified uses

Use in laboratories

#### Uses advised against

#### Reason

#### Supplier

Cytiva  
Amersham Place  
Little Chalfont  
Buckinghamshire  
HP7 9NA United Kingdom  
+44 1494 508000

Cytiva Singapore  
25 Tuas South Street 1  
Singapore 638034

#### Emergency telephone number (with hours of operation)

+65 6863 6704  
(hours of operation: 8.30 pm - 5.30 pm)

## Section 2. Hazards identification

### Classification of the substance or mixture

SKIN CORROSION/IRRITATION - Category 1  
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1  
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) [Respiratory tract irritation] - Category 3  
AQUATIC TOXICITY (CHRONIC) - Category 2

### GHS label elements, including precautionary statements

#### Hazard pictograms



#### Signal word

Danger

#### Hazard statements

Causes severe skin burns and eye damage.  
May cause respiratory irritation.  
Toxic to aquatic life with long lasting effects.

### Precautionary statements

#### Prevention

Wear protective gloves. Wear eye or face protection. Wear protective clothing. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Avoid breathing vapor. Wash hands thoroughly after handling.



<b>Response</b>	Collect spillage. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or physician.
<b>Storage</b>	Store locked up.
<b>Disposal</b>	Dispose of contents and container in accordance with all local, regional, national and international regulations.
<b>Other hazards which do not result in classification</b>	None known.

### Section 3. Composition/information on ingredients

Substance/mixture	Mixture		
Other means of identification	Not available.		
Chemical formula	Not applicable.		
Ingredient name	%	Identifiers	
TCA (ISO); trichloroacetic acid	9	CAS: 76-03-9 EC: 200-927-2	

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

### Section 4. First aid measures

#### Description of necessary first aid measures

<b>Eye contact</b>	Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.
<b>Inhalation</b>	Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
<b>Skin contact</b>	Get medical attention immediately. Call a poison center or physician. Wash contaminated skin with soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.
<b>Ingestion</b>	Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

#### Most important symptoms/effects, acute and delayed

##### Potential acute health effects

<b>Eye contact</b>	Causes serious eye damage.
<b>Inhalation</b>	May cause respiratory irritation. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
<b>Skin contact</b>	Causes severe burns.
<b>Ingestion</b>	May cause burns to mouth, throat and stomach.

##### Over-exposure signs/symptoms

<b>Eye contact</b>	Adverse symptoms may include the following: pain watering redness
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<b>Inhalation</b>	Adverse symptoms may include the following: respiratory tract irritation coughing
<b>Skin contact</b>	Adverse symptoms may include the following: pain or irritation redness blistering may occur
<b>Ingestion</b>	Adverse symptoms may include the following: stomach pains

**Indication of immediate medical attention and special treatment needed, if necessary**

<b>Notes to physician</b>	In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
<b>Specific treatments</b>	No specific treatment.
<b>Protection of first-aiders</b>	No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

**Section 5. Fire-fighting measures****Extinguishing media**

<b>Suitable extinguishing media</b>	Use an extinguishing agent suitable for the surrounding fire.
<b>Unsuitable extinguishing media</b>	None known.
<b>Specific hazards arising from the chemical</b>	In a fire or if heated, a pressure increase will occur and the container may burst. This material is toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
<b>Hazardous thermal decomposition products</b>	Decomposition products may include the following materials: carbon dioxide carbon monoxide halogenated compounds carbonyl halides metal oxide/oxides
<b>Special protective actions for fire-fighters</b>	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
<b>Special protective equipment for fire-fighters</b>	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

**Section 6. Accidental release measures****Personal precautions, protective equipment and emergency procedures**

<b>For non-emergency personnel</b>	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
<b>For emergency responders</b>	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
<b>Environmental precautions</b>	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

**Methods and materials for containment and cleaning up**

<b>Small spill</b>	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
<b>Large spill</b>	Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). The spilled material may be neutralized with sodium carbonate, sodium bicarbonate or sodium hydroxide. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.



Section 7. Handling and storage

Precautions for safe handling

Protective measures	Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Keep away from alkalis. Empty containers retain product residue and can be hazardous. Do not reuse container.
Advice on general occupational hygiene	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
Conditions for safe storage, including any incompatibilities	Store between the following temperatures: 20 to 25°C (68 to 77°F). Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Separate from alkalis. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

<u>Occupational exposure limits</u>	
Ingredient name	Exposure limits
TCA (ISO); trichloroacetic acid	Workplace Safety and Health Act (Singapore, 1/2025) PEL (long term) 8 hours: 1 ppm. PEL (long term) 8 hours: 6.7 mg/m³.
<u>Biological exposure indices</u>	
No exposure indices known.	
Appropriate engineering controls	Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.
Environmental exposure controls	Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.
<u>Individual protection measures</u>	
Hygiene measures	Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
Eye/face protection	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.
<u>Skin protection</u>	
Hand protection	Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
Body protection	Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Other skin protection	Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Respiratory protection	Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state	Liquid.
Color	Colorless.
Odor	Not available.
Odor threshold	Not available.
pH	1
Melting point/freezing point	Not available.
Boiling point or initial boiling point and boiling range	Not available.
Flash point	Not applicable.
Burning time	Not applicable.
Burning rate	Not applicable.
Evaporation rate	Not available.
Flammability	Not available.
Lower and upper explosive (flammable) limits	Not available.
Vapor pressure	Not available.

	Ingredient name	Vapor Pressure at 20°C			Vapor pressure at 50°C		
		mm Hg	kPa	Method	mm Hg	kPa	Method
	water	17.5	2.3				
	TCA (ISO)	0.06	0.008				
Relative vapor density	Not available.						
Relative density	Not available.						
Solubility(ies)							

	Media	Result
	cold water hot water	Easily soluble Easily soluble
Solubility in water	Not available.	
Partition coefficient: n-octanol/ water	Not available.	
Auto-ignition temperature	Not available.	
Decomposition temperature	Not available.	
SADT	Not available.	
Viscosity	Not available.	
Flow time (ISO 2431)	Not available.	

Particle characteristics

Median particle size	Not applicable.
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Section 10. Stability and reactivity

Reactivity	No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	The product is stable.
Possibility of hazardous reactions	Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	No specific data.
Incompatible materials	Attacks many metals producing extremely flammable hydrogen gas which can form explosive mixtures with air. Reactive or incompatible with the following materials: alkalis
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
SADT	Not available.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Not available.

Conclusion/Summary [Product] Not available.

Ingredient name	Conclusion/Summary
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TCA (ISO); trichloroacetic acid

ACGIH : Proven animal carcinogenic substance of potential relevance to humans.

**Skin corrosion/irritation****Product/ingredient name**

TCA (ISO); trichloroacetic acid

**Result****Human - Skin - Severe irritant**Duration of treatment/exposure: 24 hoursAmount/concentration applied: 35 pph**Conclusion/Summary [Product]** Corrosive to the skin.**Serious eye damage/eye irritation**

Not available.

**Conclusion/Summary [Product]** Corrosive to eyes.**Respiratory corrosion/irritation**

Not available.

**Conclusion/Summary [Product]** May cause respiratory irritation.**Respiratory or skin sensitization**

Not available.

**Skin****Conclusion/Summary [Product]** Not available.**Respiratory****Conclusion/Summary [Product]** Not available.**Germ cell mutagenicity**

Not available.

**Conclusion/Summary [Product]** Not available.**Carcinogenicity**

Not available.

**Conclusion/Summary [Product]** Not available.**Reproductive toxicity**

Not available.

**Conclusion/Summary [Product]** Not available.**Specific target organ toxicity (single exposure)****Product/ingredient name**

TCA (ISO); trichloroacetic acid

**Result**

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**Specific target organ toxicity (repeated exposure)**

Not available.

**Aspiration hazard**

Not available.

**Information on the likely routes of exposure**

Routes of entry anticipated: Oral, Dermal, Inhalation.

**Potential acute health effects****Eye contact**

Causes serious eye damage.



<b>Inhalation</b>	May cause respiratory irritation. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
<b>Skin contact</b>	Causes severe burns.
<b>Ingestion</b>	May cause burns to mouth, throat and stomach.
<b><u>Symptoms related to the physical, chemical and toxicological characteristics</u></b>	
<b>Eye contact</b>	Adverse symptoms may include the following: pain watering redness
<b>Inhalation</b>	Adverse symptoms may include the following: respiratory tract irritation coughing
<b>Skin contact</b>	Adverse symptoms may include the following: pain or irritation redness blistering may occur
<b>Ingestion</b>	Adverse symptoms may include the following: stomach pains

**Delayed and immediate effects and also chronic effects from short and long term exposure****Short term exposure**

<b>Potential immediate effects</b>	Corrosive to eyes and skin.
<b>Potential delayed effects</b>	Not available.

**Long term exposure**

<b>Potential immediate effects</b>	May cause respiratory irritation.
<b>Potential delayed effects</b>	Not available.

**Potential chronic health effects**

Not available.

**Conclusion/Summary [Product]** Not available.

<b>General</b>	No known significant effects or critical hazards.
<b>Carcinogenicity</b>	No known significant effects or critical hazards.
<b>Mutagenicity</b>	No known significant effects or critical hazards.
<b>Reproductive toxicity</b>	No known significant effects or critical hazards.

**Numerical measures of toxicity****Acute toxicity estimates**

N/A

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**Section 12. Ecological information****Toxicity**

<b>Product/ingredient name</b>	<b>Result</b>
TCA (ISO); trichloroacetic acid	<b>Acute - EC50 - Fresh water</b>
	Daphnia - Water flea - <i>Daphnia magna</i> - Neonate
	Age: <24 hours
	146 mg/l [48 hours]
	Effect: Intoxication
	<b>Acute - LC50 - Fresh water</b>
	Fish - Trout Family - <i>Salmonidae</i> - Fry
	1050 mg/l [96 hours]
	Effect: Mortality
	<b>Acute - EC50 - Fresh water</b>
	OECD
	Algae - Green algae - <i>Desmodesmus subspicatus</i> - Exponential growth phase
	4.7 mg/l [72 hours]
	Effect: Population
	<b>Chronic - NOEC - Fresh water</b>
	OECD
	Algae - Green algae - <i>Desmodesmus subspicatus</i> - Exponential growth phase
	3 mg/l [72 hours]
	Effect: Population
	<b>Chronic - NOEC - Fresh water</b>
	OECD
	Daphnia - Water flea - <i>Daphnia magna</i>



Age: <24 hours  
285 mg/l [21 days]  
Effect: Mortality

**Chronic - NOEC - Marine water**  
OECD  
Fish - Sheepshead minnow - *Cyprinodon variegatus* - Embryo  
235 mg/l [32 days]  
Effect: Mortality

**Conclusion/Summary [Product]** Toxic to aquatic life with long lasting effects.

#### Persistence/degradability

Not available.

**Conclusion/Summary [Product]** Not available.

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
TCA (ISO); trichloroacetic acid	-	-	Not readily

#### Bioaccumulative potential

Product/ingredient name	LogP <sub>ow</sub>	BCF	Potential
TCA (ISO); trichloroacetic acid	1.33	1.7	Low

#### Mobility in soil






**Soil/Water partition coefficient** Not available.

**Other adverse effects** No known significant effects or critical hazards.

### Section 13. Disposal considerations

**Disposal methods** The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

### Section 14. Transport information

	UN	IMDG	IATA
<b>UN number</b>	UN2564	UN2564	UN2564
<b>UN proper shipping name</b>	Trichloroacetic acid solution (TCA (ISO), solution)	Trichloroacetic acid solution (TCA (ISO), solution). Marine pollutant (TCA (ISO))	Trichloroacetic acid solution (TCA (ISO), solution)
<b>Transport hazard class(es)</b>	8  	8  	8 
<b>Packing group</b>	II	II	II
<b>Environmental hazards</b>	Yes.	Yes.	No.
<b>Additional information</b>	-	-	-
	<b>ADR/RID</b>	<b>ADN</b>	
<b>UN number</b>	UN2564	UN2564	
<b>UN proper shipping name</b>	Trichloroacetic acid solution (TCA (ISO), solution)	Trichloroacetic acid solution (TCA (ISO), solution)	





**Transport hazard class(es)**

8

8

**Packing group**

II

II

**Environmental hazards**

Yes.

Yes.

**Additional information**Tunnel code  
E**Special precautions for user****Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.**Transport in bulk according to IMO instruments**

Not available.

## Section 15. Regulatory information

### Singapore - hazardous chemicals under government control

None.

### International regulations

#### Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

#### Montreal Protocol

Not listed.

#### Stockholm Convention on Persistent Organic Pollutants

Not listed.

#### Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

#### UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

### International lists

#### National inventory

<b>United States</b>	All components are listed or exempted.
<b>Canada inventory</b>	All components are listed or exempted.
<b>China</b>	All components are listed or exempted.
<b>Japan</b>	All components are listed or exempted.

## Section 16. Other information

### History

<b>Date of printing</b>	19 February 2026
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### **Key to abbreviations**

ATE = Acute Toxicity Estimate  
 BCF = Bioconcentration Factor  
 GHS = Globally Harmonized System of Classification and Labelling of Chemicals  
 IATA = International Air Transport Association  
 IBC = Intermediate Bulk Container  
 IMDG = International Maritime Dangerous Goods  
 LogPow = logarithm of the octanol/water partition coefficient  
 MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)  
 N/A = Not available  
 UN = United Nations

### Procedure used to derive the classification



Classification		Justification
SKIN CORROSION/IRRITATION - Category 1		On basis of test data
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE)		Calculation method
(Respiratory tract irritation) - Category 3		
AQUATIC HAZARD (LONG-TERM) - Category 2		Calculation method
References	Not available.	

 Indicates information that has changed from previously issued version.

**Notice to reader**

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.  
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

