TBE buffer concentrate

Safety data sheet

Prepared in accordance with Regulation (EC) No. 1907/2006 (REACH)

Version 1.1 | Created: 4 February 2015 | Revised: 1 June 2015

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

Product name and description	Tris-Borate-EDTA (TBE) buffer concentrate
Trade name/Brand	Not applicable
Synonym(s)	TBE buffer
REACH Number	Not applicable, mixture
CAS Number	Not applicable, mixture
EC Number	Not applicable, mixture
Recommended use	This product is a laboratory preparation for educational use only. Each 50 ml of the concentrated TBE buffer should be diluted with 450 ml of distilled or deionised water before use. This diluted solution should be used for DNA gel electrophoresis as described in the relevant Teacher's and Students' guides provided by the NCBE. **Please note that this *Safety Data Sheet* refers to the TBE buffer *concentrate*, not to the diluted TBE buffer.**
Uses advised against	Do not use for protein agarose electrophoresis; use TE buffer instead.
Supplier of the product and of this safety data sheet	National Centre for Biotechnology Education (NCBE) University of Reading 2 Earley Gate Whiteknights READING RG6 6AU United Kingdom T: 0118 9873743 F: 0118 9750140 E: NCBE@reading.ac.uk W: www.ncbe.reading.ac.uk
Manufacturer of the product	Severn Biotech Limited Unit 2 Park Lane KIDDERMINSTER DY11 6TJ
Emergency telephone number	0118 9873743 (NCBE, University of Reading. 08.30–17.00 weekdays only)

SECTION 2. Hazards identification

Classification according to Regulation (EC) No. 1272/2008 [CLP]	H315	Skin corrosion/irritation (Category 2)
	H319	Serious eye Damage/Eye irritation (Category 2)
	H335	Specific target organ toxicity, Single exposure (Category 3)
Label elements*	**WARNING**	
	H315	Causes skin irritation
	H319	Causes serious eye irritation
	H335	May cause respiratory irritation
	P260	Do not breathe dust/mist/vapour/spray
	P280	Wear protective gloves/ protective clothing/ eye protection
	P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
	P302+P352	IF ON SKIN: Wash with plenty of soap and water
Other hazards	None found.	

** Some statements above are omitted from the product label, as the volume of the mixture is less than 125 ml.*

SECTION 3. Composition/Information on the ingredients

Name of component (Synonym) [CLP index number]	Weight (%)	EC (EINECS) number	CAS number	REACH registration number	Classification under Regulation (EC) No 1272/2008 [CLP]*
Water	80–85	231-791-2	7732-18-5	–	–
TRIS (Trometamol; tris(hydroxymethyl)aminomethane; 2-Amino-2-hydroxymethyl-propane-1,3-diol)	12	201-064-4	77-86-1	–	Skin Irrit. 2 (H315) Eye Irrit. 2 (H319) STOT SE 3 (H335)
Boric acid [005-007-00-2]	2.75	233-139-2	10043-35-3	–	Repr. 1B (H360)
EDTA disodium salt dihydrate (Disodium EDTA)	<1	205-358-3	6381-92-6	–	Acute Tox. 4 (H332)

** These classifications refer to the pure (100%) substances, not necessarily to the mixture supplied.*

For the full text of the safety classifications (H-statements), refer to Section 16.

Note on boric acid

Boric acid, along with all boron compounds, is catagorised by the European Union as a Substance of Very High Concern (SVHC). Usually the presence of an SVHC at ≥0.1% would trigger additional hazard warnings on the product label and safety data sheet.

There is, however, a European Union 'harmonised classification' specifically for boric acid (which is widely used in building materials, cosmetics *etc*) meaning that additional hazard labelling is only required at ≥5.5%. Typically, a 10x TBE concentrate contains approximately 5% boric acid, which, depending upon the exact proportions of boric acid and other components used, may or may not require additional hazard statements. For this reason some 10x TBE concentrates, although all essentially the same product, are labelled as being more hazardous than others.

Please note, however, that while the TBE concentrate that this data sheet refers to should be diluted ten-fold before use, the boric acid content of this particular concentrate is roughly *half* that which is normally used in similar products. This does not affect the performance of the buffer, but it ensures that the concentration of boric acid used is well below that which may pose additional safety hazards.

SECTION 4. First aid measures

General information	The principal hazards from this concentrate are skin and eye contact.
Inhalation	Move the casualty to fresh air. If respiratory problems occur, consult a doctor.
Skin contact	Remove contaminated clothing, which can then be washed as normal. Wash TBE concentrate off the skin immediately with plenty of water. Seek medical attention if irritation occurs.
Eye contact	Check for and remove contact lenses if present. Rinse opened eye immediately with running water, also wash under the eyelids, for several minutes. Seek medical advice if irritation persists.
Ingestion	Rinse out mouth with water, then drink plenty of water. Do not induce vomiting. Seek medical help immediately.
Self-protection of the first aider	Rinse your hands with water after handling anything that has been contaminated with the TBE buffer solution.
Most important symptoms and effects, both acute and delayed	Irritation to the skin and eyes.
Indication of any immediate medical attention and special treatment	First Aid as outlined above, decontamination of clothing *etc*, treatment by a medical professional if symptoms persist.
Advice to doctor	Treat symptomatically.

SECTION 5. Fire fighting measures

Suitable extinguishing media	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Extinguishing media which must not be used for safety reasons	No information available.
Special hazards arising from the substance or mixture	Thermal decomposition can lead to the release of irritating gases and vapours.
Advice for fire fighters	As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapours.

SECTION 6. Accidental release measures

The volumes of TBE buffer concentrate that are likely to be used in a school are small enough that any spill can be cleaned up easily and safely. The principal dangers are skin and eye contact, as described in Section 4 above.

Personal precautions, protective equipment and emergency procedures	Ensure adequate ventilation. Wear personal protective equipment, such as a lab coat, gloves and eye protection. Keep students away from the spill.
Environmental precautions	The TBE buffer concentrate should not be released into the environment. If it enters drains *etc*, it should be washed away (diluted) with plenty of water.
Methods and materials for containment and cleaning up	Soak up the concentrate with inert absorbent material (*e.g.*, paper towels or sawdust). Place the waste in a suitable, closed container (*e.g.*, a plastic bag) for disposal. Wash away any residue with plenty of water.

SECTION 7. Handling and storage

Precautions for safe handling	Ensure good ventilation. Wear personal protective equipment, such as a lab coat, gloves and eye protection. Do not get into eyes, on skin or clothing. Washing and eye wash facilities should be available in the work area. Prevent the formation of aerosols. Do not breathe in vapours or dust from dried-up buffer solution. Do not ingest.
Conditions for safe storage	Keep the TBE buffer concentrate in a tightly-closed container. Store in a dry, cool and well-ventilated place. Do not refrigerate the concentrate, although note that the *diluted* TBE buffer should be stored in a fridge at 3–5 °C.

SECTION 8. Exposure control/personal protection

Control parameters

Exposure limits	The product as supplied does not contain any hazardous materials with occupational exposure limits established by regulatory bodies.
Biological limit values	The product as supplied does not contain any hazardous materials with occupational exposure limits established by regulatory bodies.
Derived no effect level	No information available.
Predicated no effect level	No information available.

Personal protective equipment

Eye protection	Wear safety glasses. Ensure that eyewash stations are close at hand, in case of accidental splashes into the eyes.
Hand protection	Protective gloves.
Skin and body protection	Wear appropriate protective gloves and a lab coat to prevent skin exposure.
Respiratory protection	Not required.
Hygiene measures	Handle in accordance with good industrial hygiene and safety practice.
Environmental exposure controls	No information available..

SECTION 9. Physical and chemical properties

Appearance	Clear, colourless.
Physical state	Liquid.
Odour	Odourless.
Odour threshold	Does not apply, as the mixture is odourless.
pH	8.2–8.4 @ 20 °C
Melting point / Range	No data available.
Boiling point / Range	> 100 °C @ 760 mm Hg.
Flash point	Not applicable; does not flash.
Evaporation rate	No data available.
Flammability (solid, gas)	Not applicable as the mixture is a liquid.
Explosion limits	No data available.
Vapour pressure	No data available.
Vapour density	No data available.
Density @ 20 °C	~ 1.05 g / ml
Relative density	Not applicable as the mixture is a liquid.
Solubility in water	Readily soluble.
Solubility in other solvents	No data available.
Partition coefficient: n-octanol/water	No data available.
Autoignition temperature	No data available.
Decomposition temperature	No data available.
Viscosity	No data available.
Explosive properties	No data available.

Oxidising properties	No data available.

Other information
No additional information relevant to the safe use of the substance.

SECTION 10. Stability and reactivity

Reactivity	No information available.
Chemical stability	When stored at room temperature, the product is stable.
Possibility of hazardous reactions	None in normal use.
Conditions to avoid	Do not freeze or refrigerate. Avoid excess heat.
Incompatible materials	Strong oxidising agents.
Hazardous decomposition products	Nitrogen oxide (NO_X); Carbon monoxide (CO); Carbon dioxide (CO_2).

SECTION 11. Toxicological information

Acute toxicity	TRIS: LD50 Oral 5900 mg/kg (Rat)
Irritation	On the skin: no irritant effect; On the eye: irritating effect.
Corrosivity	No information available.
Sensitisation	No sensitising effects known.
Repeated dose toxicity	No information available.
Carcinogenicity	No information available.
Mutagenicity	No information available.
Toxicity for reproduction	Animal tests show that boric acid may have toxic effects on human reproduction, but at the concentration supplied, this is not thought to be a problem (see Section 3).
Developmental effects	No information available.
Target organs	None known.
Other adverse effects	The toxicological properties have not been fully investigated.
Endocrine disruptor information	None known.

SECTION 12. Ecological information

Ecotoxicity effects	Do not empty into drains without dilution (see Section 13).
Toxicity	No information available.
Persistence and degradability	Biodegradable.
Bioaccumulative potential	Not expected to bioaccumulate.
Mobility in soil	No information available.
Results of PBT and vPVB assessment	Not applicable.
Other adverse effects	None known.

SECTION 13. Disposal considerations

Waste from residues/unused product	Wash down a foul water drain with plenty of water. Wipe up any spills of the solution with absorbent material (*e.g.*, paper towels) and water. Dispose of the paper towels in the normal waste.
Contaminated packaging	Rinse with water and dispose of in normal waste according to local regulations. Recycle (the bottles are HDPE) where appropriate facilities are available.

SECTION 14. Transport information

UN number	Not applicable.
UN proper shipping name	Not applicable.
Transport hazard class	Not applicable.
Packaging group	Not applicable.
Environmental hazards	Not applicable.

SECTION 15. Regulatory information

Chemical Safety Assessment A Chemical Safety Assessment has not been carried out.

Schools and colleges in the UK should refer to *Topics in Safety*, which includes chapters on both practical microbiology and work with DNA: *Topics in safety* (2001) [Third edition] Association for Science Education. ISBN: 0863573169.

An updated (October 2014) version of Chapter 16, covering work with DNA, can be found on the NCBE's web site: **www.ncbe.reading.ac.uk** and on the Association for Science Education's web site: **www.ase.org.uk**

SECTION 16. Other information

Full text of GHS hazard statements

H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H360	May damage fertility. May damage the unborn child.

Please refer to the Teacher's guide that accompanies the NCBE kit you are using the TBE buffer with. This can be downloaded from the NCBE's Web site: **www.ncbe.reading.ac.uk**

The information given in this Safety Data Sheet is based on the present state of our knowledge.

This Safety Data Sheet has been compiled and is solely intended for this product.

This Safety Data Sheet was revised on 1 June 2015, when the older (67/548/EEC [DSD]) safety classifications were deleted.

The advice in Section 8 has been simplified, bearing in mind the volumes of the mixture likely to be used in a school, and the facilities that are generally available in school laboratories.

END OF SAFETY DATA SHEET