TBE buffer

Tris/Borate/EDTA electrophoresis buffer, aqueous solution

Product No. A1417 ; A0972

Description

Product number:		**A1417** 5X concentrated	**A0972** 10X concentrated
Composition:	Tris ultrapure	53.91 g/L (0.45 mol/L)	107.81 g/L (0.89 mol/L)
	Boric acid	27.52 g/L (0.45 mol/L)	55.03 g/L (0.89 mol/L)
	EDTA · Na_2	3.72 g/L (0.01 mol/L)	7.44 g/L (0.02 mol/L)
pH (water, 20°C):	8.3 ± 0.2		
Working concentration:	0.25X to 1X		
Storage:	room temperature		

Comment

TBE is employed as an electrophoresis buffer for acrylamide gels and agarose gels for the separation of nucleic acids and, in case of 'simple' applications, for the separation of proteins. It is used in the pH range of 8.0 to 8.5 (1-5). Less than half of the Tris and boric acid molecules are ionized, so that the ionic strength is much lower than the concentration of the buffer components. The ionic strength determines the electric current (4).

TBE has a higher buffering capacity than TAE (Tris/acetate/EDTA), for historical reasons the most commonly used electrophoresis buffer. TAE has a lower buffering capacity than TBE, but double-stranded, linear DNA migrates approximately 10% faster through TAE than TBE with the same resolution. The resolution of supercoiled DNA is better in TAE than TBE. TBE is used at a working strength of 1X for polyacrylamide gels and 0,5X for agarose gels. Exceptions for plyacrylamide gels are 'band shifts' (gel mobility shift assay or electrophoretic mobility-shift assay; EMSA) with a working strength of 0,5X TBE or even 0,25X TBE (e.g. Ref. 3). It is not recommended to use TBE for preparative agarose gel electrophoresis, since TBE might interact with agarose and therefore reduces the yield of nucleic acids to be recovered from the gel (2). The addition of EDTA minimizes the aggregation of nucleic acids by magnesium ions. TBE is made up as a 5X or 10X concentrate and stored at room temperature. (A precipitate forms when concentrated solutions of TBE are stored for long periods of time. In some cases, such precipitation may be re-dissolved by heating the buffer to about 50°C).

Application and Literature

(1)Molecular weight estimation and separation of ribonucleic acid by electrophoresis in agarose-acrylamide composite gels. (Peacock, A.C. & Dingman, C.W. (1967) *Biochemistry* **7**, 668-674)
(2)Electrophoresis in agarose and acrylamide gels. (Ogden, R.C. & Adams, D.A. (1987) *Methods Enzymol.* **152**, 61-87)
(3)High-affinity DNA-protein interaction of the cellular ETS1 protein: the determination of the ETS binding motif. (Fisher, R.J. *et al.* (1991) *Oncogene* **6**, 2249-2254)
(4)Sambrock, J., Fritsch, E.F. & Maniatis, T. (1989) *Molecular Cloning:* A Laboratory Manual, 2nd Edition. Page 6.7. Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York.
(5)Ausubel, F.A., Brent, R., Kingston, R.E., Moore, D.D., Seidman, J.G., Smith, J.A. & Struhl, K. (eds.) (1995) *Current Protocols in Molecular Biology.* Page A.2.5 Supplement 40. Greene Publishing & Wiley-Interscience, New York.