PanReac AppliChem
ITW Reagents

TAE buffer

Tris/Acetate/EDTA electrophoresis buffer, aqueous solution
Product No. A1416 ; A1691

Description

Product number:		**A1416** 10X concentrated	**A1691** 50X concentrated
Composition:	Tris ultrapure	48.46 g/L (0.40 mol/L)	242.28 g/L (2.00 mol/L)
	Acetic acid glacial	12.01 g/L (0.20 mol/L)	60.05 g/L (1.00 mol/L)
	EDTA · Na_2	3.72 g/L (0.01 mol/L)	18.61 g/L (0.05 mol/L)
pH (Water, 20°C):	8.5 ± 0.2		
Working concentration:	0.5X to 1X		
Storage:	room temperature		

Comment

TAE buffer is the most commonly used running buffer for agarose gels. Originally, this buffer system was developed for polyacrylamide gel electrophoresis with a slightly different composition (40 mM Tris; 20 mM NaOAc; 2 mM EDTA · Na_2; pH 7.8 at 5°C with acetic acid; Ref. 1). For stabilizing the secondary structure of RNA, sodium acetate was included. Acetate was used as the anion instead of chloride to avoid the formation of hypochlorite by electrolysis (1). The addition of EDTA to the electrophoresis buffer minimizes the aggregation of nucleic acids by magnesium ions. Aggregated nucleic acids will not enter the gel.

Today, TAE is used in a modified composition (40 mM Tris-acetate; 1 mM EDTA · Na_2; ~pH 8.5 at room temperature). 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. Because of its low buffering capacitiy, it may become exhausted during long periods of time at high current. Therefore TAE should be replaced during extended electrophoresis or should be recirculated. An advantage of TAE over TBE is the absence of interactions with agarose, resulting in a higher yield of nucleic acids in preparative agarose gel electrophoresis (2). Usually TAE is made up as a 50X concentrated stock solution and employed in an 1X or 0,5X working concentration.

Application and Literature

(1)The fractionation of high-molecular-weight ribonucleic acid by polyacrylamide-gel electrophoresis. (Loening, U.E. (1967) *Biochem. J.* **102**, 251-257)

(2)Electrophoresis in agarose and acrylamide gels. (Ogden, R.C. & Adams, D.A. (1987) *Methods Enzymol.* **152**, 61-87)

(3)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.

(4)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.