Tris ultrapure

Tris-(hydroxymethyl)-aminomethane (THAM);
2-Amino-2-(hydroxymethyl)-propane-1,3-diol; Trometamol; Tris base
Product-No. A1086

Description

Formula:	$C_4H_{11}NO_3$
Molecular weight:	121.14 g/mol
CAS-No.:	[77-86-1]
HS-No.:	2922 19 000
Assay (titr.):	min. 99.9 %
Melting point:	170 - 172°C
pH (1 M in water, 20°C):	10.5 - 11.5
useful buffer range:	pH 7.2 - 9.0
Working concentration:	10 - 100 mM
pKa (20°C):	8.3
ΔpH/Δt (pH units/°C):	-0.031
Storage:	room temperature

Comment

Tris is the most commonly used buffer in biological research. One of its most important applications is the use as an electrophoresis buffer (e.g. TBE, see A1417 and A0972 or TAE, see A1416 and A1691) for polyacrylamide and agarose gel electrophoresis, respectively. Besides, Tris is used as TE buffer (pH 8.0) for the storage and dissolving of nucleic acids. EDTA protects the nucleic acids by complexing Me^{++}-ions needed from nucleases for their activity. A 1 *M* Tris solution is made up by dissolving 121 g Tris base in 800 ml of water, adjusting to the desired pH with conc. HCl and filling up to 1 Liter with water. Tris should not be used at pH values under ~pH 7.2 or above ~pH 9.0. The pH value of a Tris buffer strongly depends on the temperature and the pH changes by 0.1 units when diluted by a factor of 10. Therfore, Tris buffers should be prepared at the temperature where it is used and the pH changes should be taken into consideration when the buffer should be diluted. Tris will inactivate the RNase inhibitor DEPC, a chemical that is commonly used to treat all equipment and solutions, that get into contact with the RNA during its preparation. In addition Tris may form Schiff bases with aldehydes / ketones.

Application and Literature

(1)Blocking in western blots by incubation of the nitrocellulose membrane after blotting with TBST (10 mM Tris-HCl, pH 8.0, 150 mM NaCl, 0.05% Tween 20) with 5% nonfat dried milk (Takemoto, Y. *et al.* (1995) *EMBO J.* **14**, 3403-3414) or TBS (100 mM Tris-HCl, pH 7.5, 0.9% NaCl) with 10% (w/v) nonfat dried milk (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.* Supplement 39 Page 10.8.10; Greene Publishing & Wiley-Interscience, New York).
(2)TBE is one of the most commonly used electrophoresis buffers with the composition for a 10X buffer: 890 mM Tris base, 890 mM boric acid, 20 mM EDTA (pH 8.3) (for 1Liter: 108 g Tris base, 9.3 g EDTA · Na_2, 55 g boric acid, pH 8.3). (Peacock, A.C. & Dingman, C.W. (1967) *Biochemistry* **6**, 1818-1827; 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.* Supplement 40 Page A.2.5, Greene Publishing & Wiley-Interscience, New York; Ogden, R.C. & Adams, D.A. (1987) *Methods Enzymol.* **152**, 61-87).

(3)RIPA buffer: 150 mM NaCl, 1% NP40, 0.5% deoxycholate, 0.1% SDS, 50 mM Tris, pH 8.0 (Hopewell, R. & Ziff, E.B. (1995) *Mol. Cell. Biol.* **15**, 3470-3478).
(4)Enzyme reaction buffers: many enzymatic reactions of DNA/RNA-modifying enzymes are carried out in Tris buffers. Usually, these buffers are made up as 10X concentrates. For a selection of the most important buffers see 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.* Supplement 21 pages 3.4.2-3.4.3; Greene Publishing & Wiley-Interscience, New York)
(5)TE buffer: 10 mM Tris-HCl (pH 7.4 or 7.5 or 8.0), 1 mM EDTA (pH 8.0); standard buffer for nucleic acids. (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.* Supplement 40 Page A.2.6; Greene Publishing & Wiley-Interscience, New York).
(6)TAE electrophoresis buffer for agarose gel electrophoresis. Working solution: 40 mM Tris/acetate, 2 mM EDTA · Na_2 · $2H_20$ (pH 8.5) (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.* Supplement 40 Page A.2.5; Greene Publishing & Wiley-Interscience, New York).
(7)Component of the electrophoresis/blotting systems for the separation/blotting of proteins by SDS-PAGE (Transfer electrode buffer: 25 mM Tris, 192 mM Glycin, 20% (v/v) Methanol, pH 8.3) (Towbin, H. *et al.* (1979) *Proc. Natl. Acad. Sci. USA* **76**, 4350-4354; Togawa, K. *et al.* (1995*) J. Biol. Chem.* **270**, 15475-15478; Harrington, M.G. (1990) *Methods Enzymol.* **182**, 488-495).

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