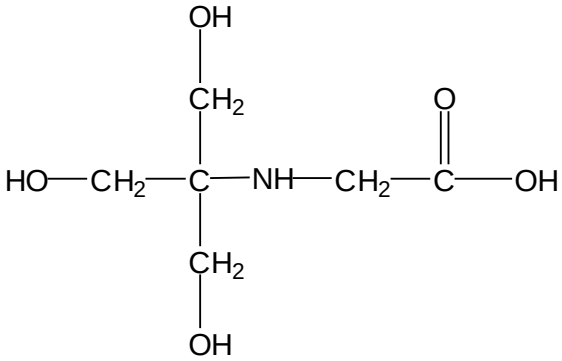
ProductInformation

TRICINE
Sigma Prod. Nos. T0377 and T9784

CAS NUMBER: 5704-04-1
SYNONYMS: N-tris(hydroxymethyl) methylglycine; N-(2-hydroxy-1,1-bis[hydroxymethyl]ethyl)glycine

PHYSICAL DESCRIPTION:

Appearance: white powder (crystalline)
Molecular formula: $C_6H_{13}NO_5$
Molecular weight: 179.2
pK_a = 8.1 at 25°C (pK_{a1} = 2.3)[1,2]
Useful buffering range pH 7.4-8.8
$\Delta pK/\Delta T$ = -0.021[3,4]
Melting point: 185-187°C with evolution of gas[1,4]
Metal binding constants (log K) for 0.1 M, 20°C:
Mg^{2+}, 1.2; Ca^{2+}, 2.4; Mn^{2+}, 2.7; Cu^{2+}, 7.3[2]



STORAGE / STABILITY AS SUPPLIED:

Tricine is expected to be stable indefinitely at room temperature. It should be reevaluated every three to five years for suitability in user application.

SOLUBILITY / STABILITY OF SOLUTIONS:

Tricine is very soluble in water; T0377 gives a clear colorless solution at 25% (w/v), T9784 is tested at 1 M, giving a clear colorless solution with a typical pH 4.0-6.0.[4]

Sterilization by filtration is recommended. For molecular biology use, treat water with DEPC prior to adding buffer such as tricine. DEPC reacts with amino groups.

GENERAL REMARKS:

Tricine was first prepared by Good to serve as a buffer for chloroplast reactions. The name "tricine" comes from "tris" and "glycine" from which it was derived.[1] It is structurally similar to "tris" (T1503), but was much less inhibitory at high concentrations.[1] Comparative data for tricine and other analogs have been reported.[5] For ATP assays using firefly luciferase, tricine buffer at 25 mM was found to be the best of ten common buffers tested.[6]

GENERAL REMARKS: (continued)

Successful cryopreservation of tissues and organs depends on the physical and chemical characteristics of the preservation medium. The pH values and pK values for Tricine/DMSO mixtures were determined down to -20°C.[7]

Tricine and other Good buffers were found to be efficient scavengers of hydroxyl radicals in a study of radiation-induced membrane damage.[8]

Tricine has been recommended as the buffer of choice in SDS-PAGE systems, in separating proteins in the range of 1 to 100 kDa.[9] Sigma offers several tricine buffer products that have been tested in electrophoresis applications.

A buffer using T0377 or SigmaUltra T9784 (tested for trace metals) may be prepared by titrating with sodium hydroxide to the desired pH, using about a half-equivalent of NaOH. Mixing tables using stock solutions have also been published.[10]

REFERENCES:

1. Good, N.E., *Arch. Biochem. Biophys.*, 96, 653-661 (1962). "Uncoupling of the Hill reaction from photophosphorylation by anions."
2. Good, N.E., et al., *Biochemistry*, 5, 467-477 (1966).
3. *Methods in Enzymology*, 182, 27-28 (1990).
4. Sigma quality control.
5. Ferguson, W.J., Good, N.E., et al., *Anal. Biochem.*, 104, 300-310 (1980). "Hydrogen Ion Buffers for Biological Research."
6. Webster, J.J. and Leach, F.R., *J. Appl. Biochem.*, 2, 469 (1980).
7. Roy, R.N., et al., *Cryobiology*, 22, 589 (1985).
8. Hicks, M. and Gebicki, J.M., *FEBS Letters*, 199(1), 92 (1986).
9. Schäger, H. and von Jagow, G., *Anal. Biochem.*, 166, 368-379 (1987).
10. *Data for Biochemical Research*, 3rd Ed., Dawson, R.M.C. et al., eds. (Oxford Press, 1986), 437.